INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

WEST HILLS COMMUNITY COLLEGE DISTRICT

WEST HILLS LEMOORE CAMPUS INSTRUCTIONAL CENTER PROJECT

Comments must be received by: January 22, 2021 (30 days after notice)

DECEMBER 2020

INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

WEST HILLS LEMOORE CAMPUS INSTRUCTIONAL CENTER PROJECT

Prepared for:

West Hills Community College District
275 Phelps Avenue
Coalinga, CA 93210
Contact Person: Richard Storti, Deputy Chancellor
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Consultant:

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Bakersfield, CA 93309
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December 2020

Project #200400

NOTICE OF PUBLIC HEARING AND INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

This is to advise that the West Hills Community College District has prepared a Mitigated Negative Declaration for the project identified below that is scheduled to be considered at the Board of Trustees regular meeting on Tuesday, **February 16, 2021**

PLEASE BE ADVISED that the Board of Trustees will consider adopting the Mitigated Negative Declaration at the meeting to be held on February 16, 2021. Presentations will be made at approximately 3:00 p.m. Action on items on the board agenda will occur after the presentations.

In response to the COVID-19 pandemic, the Governor of California has issued Executive Order N-25-20, Executive Order N-29-20, and Executive Order N-35-20 modifying the Brown Act in order to facilitate essential public meetings being held through remote methods, such as telephonically or electronically Consistent with the foregoing, this Board meeting is being held as a virtual meeting. The Board meeting can be viewed live on YouTube. Please go to the District's website for more information https://www.westhillscollege.com/

Project Name

West Hills College Lemoore Campus Instructional Center Project

Project Location

The project site is located on the West Hills Community College- Lemoore campus on the northwest corner of Pederson Avenue and College Avenue in the City of Lemoore, Kings County, CA. The project site is an approximately 27.1 acre portion of Assessor's Parcel Numbers 023-510-018, within Section 8, Township 19S, Range 20E, MMB&M.

Project Description

The District proposes to construct a 42,429-square-foot, two-story Instructional Center (IC) on an undeveloped but disturbed portion of the existing campus. The college has a current student enrollment of 4,600 students and the proposed expansion is anticipated to increase the overall student population by approximately 5 percent, or approximately 232 students. The IC will be used to expand education opportunities in the areas of allied health services, computer science and graphic arts.

Construction will include site clearing, rough and finished grading, trenching, backfill for underground facilities, and concrete for circulation surfaces. The two-story building will match existing campus standards and include steel framing, concrete floors, built up roofing over steel decking, and brick exterior finishes, metal roofing accents, and an elevator which will support future expansion. The project consists of lecture, laboratory, office and other rooms used for educational purposes.

Construction is expected to begin in January 2023 and end in April 2024. Construction equipment will include a crane, bulldozer, grader, bob cat, trencher, cement trucks, water trucks, trash trucks, equipment delivery trucks, and company work vehicles.

The document and documents referenced in the Initial Study/Mitigated Negative Declaration are available for review at District administrative office located at 275 Phelps Ave, Coalinga, CA 93210, or on the District website:

https://www.westhillscollege.com/district/administration/

As mandated by the California Environmental Quality Act (CEQA), the public review period for this document was 30 days (CEQA Section 15073[b]). The public review period began on December 24, 2020 and ended on January 22, 2021. For further information, please contact Jaymie Brauer at 661-616-2600 or jaymie.brauer@qkinc.com.

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: West Hills Community College Lemoore Instructional Center
Lead Agency: West Hills Community College District
Contact Person: Richard Storti
Mailing Address: 275 Phelps Ave
Phone: 559-934-2160
City: Coalinga
Zip: 93210
County: Kings

Project Location: County: Kings
City/Nearest Community: Lemoore
Cross Streets: Pederson St and College Ave
Zip Code: 93555
Longitude/Latitude (degrees, minutes and seconds): 36 ° 17 ′ 31 ″ N / 119 ° 49 ′ 24 ″ W Total Acres: 27.1
Assessor's Parcel No.: 023-510-08
Section: 8
Twp.: 19S
Range: 20 E
Base: MDB&M
Within 2 Miles: State Hwy #: 41, 198
Waterways: N/A
Airports: N/A
Railways: N/A
Schools: University Elementary Charter / Middle College HS

Document Type:

CEQA:
☐ NOP
☐ Early Cons
☐ Neg Dec
☒ Mit Neg Dec
☐ Draft EIR
☐ Supplement/Subsequent EIR
(Prior SCH No.)
Other:

NEPA:
☐ NOI
☐ EA
☐ Draft EIS
☐ FONSI

Other:
☐ Joint Document
☐ Final Document
☐ Other:

Local Action Type:

☐ General Plan Update
☐ General Plan Amendment
☐ General Plan Element
☐ Community Plan
☐ Specific Plan
☐ Master Plan
☐ Planned Unit Development
☐ Site Plan
☐ Rezone
☐ Prezone
☐ Use Permit
☐ Land Division (Subdivision, etc.)
☐ Annexation
☐ Redevelopment
☐ Coastal Permit
☐ Other:

Development Type:

☐ Residential: Units Acres
☐ Office: Sq.ft. Acres Employees
☐ Commercial: Sq.ft. Acres Employees
☐ Industrial: Sq.ft. Acres Employees
☒ Educational: new construction
☐ Recreational:
☐ Water Facilities: Type MGD
☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type MW
☐ Waste Treatment: Type MGD
☐ Hazardous Waste: Type
☐ Other:

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☒ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☒ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☒ Flood Plain/Flooding
☒ Forest Land/Fire Hazard
☒ Geologic/Seismic
☒ Minerals
☒ Noise
☒ Population/Housing Balance
☒ Public Services/Facilities
☒ Recreation/Parks
☒ Schools/Universities
☒ Septic Systems
☒ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☒ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☒ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☒ Wetland/Riparian
☒ Growth Inducement
☒ Land Use
☐ Cumulative Effects
☐ Other:

Present Land Use/Zoning/General Plan Designation:

Community Facilities

Project Description: *(please use a separate page if necessary)*

The District is proposing to construct a 42,000 square foot, two-story Instructional Center (IC) on an undeveloped but disturbed portion of the existing campus. The college has a current student enrollment of 4,600 students and the proposed expansion is anticipated to increase the overall student population by approximately 5 percent, approximately 232 students. The IC will be used to expand education opportunities in the areas of allied health services, computer science and graphic arts

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

- x Air Resources Board
- Boating & Waterways, Department of
- California Emergency Management Agency
- California Highway Patrol
- x Caltrans District # 6
- Caltrans Division of Aeronautics
- Caltrans Planning
- Central Valley Flood Protection Board
- Coachella Valley Mtns. Conservancy
- Coastal Commission
- Colorado River Board
- Conservation, Department of
- Corrections, Department of
- Delta Protection Commission
- Education, Department of
- Energy Commission
- x Fish & Game Region # 4
- Food & Agriculture, Department of
- Forestry and Fire Protection, Department of
- General Services, Department of
- Health Services, Department of
- Housing & Community Development
- x Native American Heritage Commission
- Office of Historic Preservation
- Office of Public School Construction
- Parks & Recreation, Department of
- Pesticide Regulation, Department of
- Public Utilities Commission
- x Regional WQCB # Central
- Resources Agency
- Resources Recycling and Recovery, Department of
- S.F. Bay Conservation & Development Comm.
- San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
- San Joaquin River Conservancy
- Santa Monica Mtns. Conservancy
- State Lands Commission
- SWRCB: Clean Water Grants
- x SWRCB: Water Quality
- SWRCB: Water Rights
- Tahoe Regional Planning Agency
- x Toxic Substances Control, Department of
- x Water Resources, Department of
- Other: Division of the State Architecht
- Other:

Local Public Review Period (to be filled in by lead agency)

Starting Date December 24, 2020

Ending Date January 22, 2021

Lead Agency (Complete if applicable):

Consulting Firm:
Address:
City/State/Zip:
Contact:
Phone:

Applicant:
Address:
City/State/Zip:
Phone:

Signature of Lead Agency Representative: /S/

Date: 12/24/2020

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

DISTRIBUTION LIST

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Toxic Substances Control
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Community Development Agency
Kings County Government Center
1400 W. Lacey Blvd
Hanford CA 93230

Santa Rosa Rancheria Tachi
Yokut Tribe
Chairperson
P.O. Box 8
Lemoore, CA 93245

U S. Fish and Wildlife Service
2800 Cottage Way
Rm W-2605
Sacramento, CA 95825

San Joaquin Valley Air Pollution
Control District
CENTRAL REGION
1990 E. Gettysburg Ave.
Fresno, CA 93726

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City of Lemoore
711 West Cinnamon Dr
Lemoore, CA 93245

Eshom Valley Band of Indians/Wuksache Tribe
Chairperson
1179 Rock Haven Ct.
Salinas, CA 93906

Table Mountain Rancheria
Chairperson
P.O. Box 410
Friant, CA 93626

Table Mountain Rancheria
Cultural Resources Director
P.O. Box 410
Friant, CA 93626

California Department
of Transportation
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Native American Heritage Commission
SCH DISTRIBUTION

State Water Resources
Control Board Water Quality
SCH DISTRIBUTION

Regional Water Quality Control Board
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Kings River Choinumni Farm Tribe
Chairperson
3515 East Fedora Avenue
Fresno, CA 93726

Tule River Indian Tribe
Chairperson
P.O. Box 589
Porterville, CA 93258

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MITIGATED NEGATIVE DECLARATION

As Lead Agency under the California Environmental Quality Act (CEQA), the West Hills Community College District reviewed the project described below to determine whether it could have a significant effect on the environment because of its development. In accordance with CEQA Guidelines Section 15382, "[s]ignificant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

Project Name

West Hills College Lemoore Campus Instructional Center Project

Project Location

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The project will match the existing construction and space standards set by the District. Construction is expected to begin in January 2023 and end in April 2024. Construction equipment will include a crane, bulldozer, grader, bob cat, trencher, cement trucks, water trucks, trash trucks, equipment delivery trucks, and company work vehicles.

Mailing Address and Phone Number of Contact Person

Richard Storti, Deputy Chancellor
West Hills Community College District

275 Phelps Avenue
Coalinga, CA 93210 (559) 934-2160
richardstorti@whccd.edu

Findings

As Lead Agency, the District finds that the project will not have a significant effect on the environment. The Initial Study (IS) (see *Section 3 - Environmental Checklist*) identified one or more potentially significant effects on the environment, but revisions to the project have been made before the release of this Mitigated Negative Declaration (MND) or mitigation measures would be implemented that reduce all potentially significant impacts to less-than-significant levels. The District further finds that there is no substantial evidence that this project would have a significant effect on the environment.

Mitigation Measures Included in the Project to Avoid Potentially Significant Effects

MITIGATION MEASURE(S)

MM BIO-1: Prior to ground disturbing activities, a qualified wildlife biologist shall conduct a biological clearance survey between 14 and 30 days prior to the onset of construction.

The clearance survey shall include walking transects to identify presence of San Joaquin kit fox, Swainson's hawk, and burrowing owl and any other special-status species and their sign. The pre-construction survey shall be walked by no greater than 30-foot transects for 100 percent coverage of the project and a 250-foot buffer, where feasible. If no evidence of special-status species is detected, no further action is required but measures BIO-4 through BIO-6 and BIO-8 shall be implemented.

MM BIO-2: The following avoidance and minimization measures shall be implemented during all phases of the project to reduce the potential for impact from the project. They are modified from the *U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered SJKF Prior to or During Ground Disturbance* (USFWS 2011, Appendix F).

a. All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers. All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers and removed at least once a week from the construction or project site.
b. Construction-related vehicle traffic shall be restricted to established roads and predetermined ingress and egress corridors, staging, and parking areas. Vehicle speeds shall not exceed 20 miles per hour (mph) within the project site.
c. To prevent inadvertent entrapment of kit fox or other animals during construction, the contractor shall cover all excavated, steep-walled holes or trenches more than two feet deep at the close of each workday with plywood or similar materials. If holes or trenches cannot be covered, one or more escape ramps constructed of earthen fill

or wooden planks shall be installed in the trench. Before such holes or trenches are filled, the contractor shall thoroughly inspect them for entrapped animals. All construction-related pipes, culverts, or similar structures with a diameter of four inches or greater that are stored on the project site shall be thoroughly inspected for wildlife before the pipe is subsequently buried, capped, or otherwise used or moved in anyway. If at any time an entrapped or injured kit fox is discovered, work in the immediate area shall be temporarily halted and USFWS and CDFW shall be consulted.

d. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the USFWS and CDFW have been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
e. No pets, such as dogs or cats, shall be permitted on the project sites to prevent harassment, mortality of kit foxes, or destruction of dens.
f. Use of anti-coagulant rodenticides and herbicides in project sites shall be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the USFWS and CDFW. If rodent control must be conducted, zinc phosphide shall be used because of the proven lower risk to kit foxes.
g. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative shall be identified during the employee education program and their name and telephone number shall be provided to the USFWS.
h. The Sacramento Fish and Wildlife Office of USFWS and CDFW shall be notified in writing within three working days of the accidental death or injury to a SJKF during project-related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, at the addresses and telephone numbers below. The CDFW contact can be reached at (559) 243-4014 and R4CESA@wildlifeca.gov.
i. All sightings of the SJKF shall be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed shall also be provided to the Service at the address below.
j. Any project-related information required by the USFWS or questions concerning the above conditions, or their implementation may be directed in writing to the U.S. Fish and Wildlife Service at: Endangered Species Division, 2800 Cottage Way, Suite W

2605, Sacramento, California 95825-1846, phone: (916) 414-6620 or (916) 414-6600.

k. New sightings of SJKF should be reported to the CNDDB.

MM BIO-3: Within 14 days prior to the start of project ground-disturbing activities, a pre-activity survey with a 500-foot buffer shall be conducted by a qualified biologist knowledgeable in the identification of these species and approved by the CDFW. If dens/burrows that could support any of these species are discovered during the pre-activity survey conducted under MM BIO-1, the avoidance buffers outlined below should be established. No work would occur within these buffers unless the biologist approves and monitors the activity.

Burrowing Owl (active burrows)

- Non-breeding season: September 1 – January 31 – 160 feet
- Breeding season: February 1 – August 31 – 250 feet

San Joaquin Kit Fox

- Potential or Atypical den – 50 feet
- Known den – 100 feet
- Natal or pupping den – 500 feet, unless otherwise specified by CDFW

MM BIO-4: If all project activities are completed outside of the Swainson's hawk nesting season (February 15 through August 31), this mitigation measure may be disregarded.

Nesting surveys for the Swainson's hawks shall be conducted in accordance with the protocol outlined in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (CDFG 2000). If potential Swainson's hawk nests or nesting substrates are located within 0.5 miles of the project site, then those nests or substrates must be monitored for activity on a routine and repeating basis throughout the breeding season, or until Swainson's hawks or other raptor species are verified to be using them. The protocol recommends that the following visits be made to each nest or nesting site: one visit during January 1–March 20 to identify potential nest sites, three visits during March 20–April 5, three visits during April 5–April 20, and three visits during June 10–July 30. A fewer number of visits may be permissible if deemed adequate by the City after consultation with a qualified biologist. To meet the minimum level of protection for the species, surveys shall be completed for at least the two survey periods immediately prior to project-related ground disturbance activities. If Swainson's hawks are not found to nest within the survey area, then no further action is warranted.

MM BIO-5: If an active Swainson's hawk nest is discovered at any time within 0.5 miles of active construction, a qualified biologist shall complete an assessment of the potential for current construction activities to impact the nest. The assessment will consider the type of construction activities, the location of construction relative to the nest, the visibility of construction activities from the nest location, and other existing disturbances in the area that are not related to construction activities of this project. Based on this assessment, the biologist shall determine if construction activities can proceed and the level of nest monitoring required. Construction activities shall not occur within 500 feet of an active nest but depending upon conditions at the site this distance may be reduced. Fulltime monitoring to evaluate the effects of construction activities on nesting Swainson's hawks may be required. The qualified biologist shall have the authority to stop work if it is determined that project construction is disturbing the nest. These buffers may need to increase depending on the sensitivity of the nest location, the sensitivity of the nesting Swainson's hawk to disturbances, and at the discretion of the qualified biologist.

MM BIO-6: If construction is planned outside the nesting period for raptors (other than burrowing owl) and migratory birds (February 15 to August 31), no mitigation shall be required. If construction is planned during the nesting season for migratory birds and raptors, a preconstruction survey to identify active bird nests shall be conducted by a qualified biologist to evaluate the site and a 250-foot buffer for migratory birds and a 500-foot buffer for raptors. If nesting birds are identified during the survey, active raptor nests shall be avoided by 500 feet and all other migratory bird nests shall be avoided by 250 feet. Avoidance buffers may be reduced if a qualified on-site monitor determines that encroachment into the buffer area is not affecting nest building, the rearing of young, or otherwise affecting the breeding behaviors of the resident birds. Because nesting birds can establish new nests or produce a second or even third clutch at any time during the nesting season, nesting bird surveys shall be repeated every 30 days as construction activities are occurring throughout the nesting season.

No construction or earth-moving activity shall occur within a non-disturbance buffer until it is determined by a qualified biologist that the young have fledged (left the nest) and have attained sufficient flight skills to avoid project construction areas. Once the migratory birds or raptors have completed nesting and young have fledged, disturbance buffers will no longer be needed and may be removed, and monitoring may cease.

MM BIO-7: A qualified biologist shall conduct a pre-construction survey on the project site and within 500 feet of its perimeter, where feasible, to identify the presence of the western burrowing owl. The survey shall be conducted between 14 and 30 days prior to the start of construction activities. If any burrowing owl burrows are observed during the preconstruction survey, avoidance measures shall be consistent with those included in the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). If occupied burrowing owl burrows are observed outside of the breeding season (September 1 through January 31) and within 250 feet of proposed construction activities, a passive relocation effort may be instituted in accordance with the guidelines established by the California Burrowing Owl Consortium (1993) and the California Department of Fish and Wildlife (2012). During the breeding season (February 1 through August 31), a 500-foot (minimum) buffer zone shall be maintained unless a qualified biologist verifies through noninvasive methods that either the birds have not begun egg laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

In addition, impacts to occupied burrowing owl burrows shall be avoided in accordance with the following table unless a qualified biologist approved by CDFW verifies through non-invasive methods that either: 1) the birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1-Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16-Mar 31	50 m	100 m	500 m

MM BIO-8: Prior to ground disturbance activities, or within one week of being deployed at the project site for newly hired workers, all construction workers at the project site shall attend a Construction Worker Environmental Awareness Training and Education Program, developed and presented by a qualified biologist.

The Construction Worker Environmental Awareness Training and Education Program shall be presented by the biologist and shall include information on the life history wildlife and plant species that may be encountered during construction activities, their legal protections, the definition of “take” under the Endangered Species Act, measures the project operator is implementing to protect the species, reporting requirements, specific measures that each worker must employ to avoid take of the species, and penalties for violation of the Act. Identification and information regarding special-status or other sensitive species with the potential to occur on the project site shall also be provided to construction personnel. The program shall include:

- An acknowledgement form signed by each worker indicating that environmental training has been completed.
- A copy of the training transcript and/or training video/CD, as well as a list of the names of all personnel who attended the training and copies of the signed acknowledgement forms shall be maintain on site for the duration of construction activities.

MM CUL-1: If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. Implementation of the mitigation measure below would ensure that the proposed project would not cause a substantial adverse change in the significance of a historical resource.

MM CUL-2: If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code. The specific protocol, guidelines, and channels of communication outlined by the Native American Heritage Commission, in accordance with Section 7050.5 of the Health and Safety Code, Section 5097.98 of the Public Resources Code (Chapter 1492, Statutes of 1982, Senate Bill 297), and Senate Bill 447 (Chapter 44, Statutes of 1987), shall be followed. Section 7050.5(c) shall guide the potential Native American involvement, in the event of discovery of human remains, at the direction of the county coroner.

MM GEO-1: Prior to the ground disturbance activities, a qualified engineer shall be obtained. The project engineer, structural engineer, civil engineer, general contractor, the earthwork contractor shall meet to discuss the grading plan and grading requirements as outlined in the final Geotechnical Report.

MM GEO-2: Prior to issuing of grading or building permits, the project applicant shall submit to the City: (1) the approved Storm Water Pollution Prevention Plan (SWPPP) and (2) the Notice of Intent (NOI) to comply with the General National Pollutant Discharge Elimination System (NPDES) from the Central Valley Regional Water Quality Control Board. The requirements of the SWPPP and NPDES shall be incorporated into design specifications and construction contracts. Recommended Best Management Practices for the construction phase may include the following:

- Stockpiling and disposing of demolition debris, concrete, and soil properly;
- Protecting existing storm drain inlets and stabilizing disturbed areas;
- Implementing erosion controls;
- Properly managing construction materials; and
- Managing waste, aggressively controlling litter, and implementing sediment controls.

Evidence of the approved SWPPP shall be submitted to the Lead Agency.

MM GEO-3: If any paleontological resources are encountered during ground disturbance activities, all work within 25 feet of the find shall halt until a qualified paleontologist as defined by the Society of Vertebrate Paleontology Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (2010), can evaluate the find and make recommendations regarding treatment. Paleontological resource materials may include resources such as fossils, plant impressions, or animal tracks preserved in rock. The qualified paleontologist shall contact the Natural History Museum of Los Angeles County or other appropriate facility regarding any discoveries of paleontological resources.

If the qualified paleontologist determines that the discovery represents a potentially significant paleontological resource, additional investigations and fossil recovery may be required to mitigate adverse impacts from project implementation. If avoidance is not feasible, the paleontological resources shall be evaluated for their significance. If the resources are not significant, avoidance is not necessary. If the resources are significant, they shall be avoided to ensure no adverse effects, or such effects must be mitigated. Construction in that area shall not resume until the resource appropriate measures are recommended or the materials are determined to be less than significant. If the resource is significant and fossil recovery is the identified form of treatment, then the fossil shall be deposited in an accredited and permanent scientific institution. Copies of all correspondence and reports shall be submitted to the Lead Agency.

MM HYD-1: The District shall limit grading to the minimum area necessary for construction and operation of the project. Final grading plans shall include best management practices to limit on-site and off-site erosion.

MM TRA-1: Intersection and roadway improvements needed by the year 2040 to maintain or improve the operational level of service of the street system in the vicinity include:

- Signal at Bust St & Semas Dr
- Signal at Bust St & Belle Haven Dr
- Signal at Bust St & SR 41 SB Ramps
- Signal at Bust St & SR 41 NB Ramps
- Signal at Bust St & S. 19th ½ Ave

SECTION 1 - INTRODUCTION

1.1 - Overview

The District is proposing to construct a 42,000-square-foot, two-story Instructional Center (IC) on an undeveloped but disturbed portion of the existing campus. The proposed expansion is anticipated to increase the overall student population by approximately five percent. The IC will be used to expand education opportunities in the areas of allied health services, computer science and graphic arts.

1.2 - CEQA Requirements

The West Hills Community College District is the Lead Agency for this project pursuant to the CEQA Guidelines (Public Resources Code Section 15000 et seq.). The Environmental Checklist (CEQA Guidelines Appendix G) or Initial Study (IS) (see *Section 3 – Initial Study*) provides analysis that examines the potential environmental effects of the construction and operation of the project. Section 15063 of the CEQA Guidelines requires the Lead Agency to prepare an IS to determine whether a discretionary project will have a significant effect on the environment. A Mitigated Negative Declaration (MND) is appropriate when an IS has been prepared and a determination can be made that no significant environmental effects will occur because revisions to the project have been made or mitigation measures will be implemented that reduce all potentially significant impacts to less-than-significant levels. The content of an MND is the same as a Negative Declaration, with the addition of identified mitigation measures and a Mitigation Monitoring and Reporting Program (MMRP) (see Section 6 – *Mitigation Monitoring and Reporting Program*).

Based on the IS, the Lead Agency has determined that the environmental review for the proposed application can be completed with an MND.

1.3 - Impact Terminology

The following terminology is used to describe the level of significance of project environmental impacts.

- A finding of "no impact" is appropriate if the analysis concludes that the project would not affect a topic area in any way.
- An impact is considered "less than significant" if the analysis concludes that it would cause no substantial adverse change to the environment and requires no mitigation.
- An impact is considered "less than significant with mitigation incorporated" if the analysis concludes that it would cause no substantial adverse change to the environment with the inclusion of environmental commitments that have been agreed to by the proponent.
- An impact is considered "potentially significant" if the analysis concludes that it could have a substantial adverse effect on the environment.

1.4 - Document Organization and Contents

The content and format of this IS/MND is designed to meet the requirements of CEQA. The report contains the following sections:

- *Section 1 – Introduction:* This section provides an overview of CEQA requirements, intended uses of the IS/MND, document organization, and a list of regulations that have been incorporated by reference.
- *Section 2– Project Description:* This section describes the project and provides data on the site's location.
- *Section 3 – Environmental Checklist:* This section contains the evaluation of 21 different environmental resource factors contained in Appendix G of the CEQA Guidelines. Each environmental resource factor is analyzed to determine whether the proposed project would have an impact. One of four findings is made which include: no impact, less-than-significant impact, less than significant with mitigation, or significant and unavoidable. If the evaluation results in a finding of significant and unavoidable for any of the 21 environmental resource factors, then an Environmental Impact Report will be required.
- *Section 4 – References:* This section contains a full list of references that were used in the preparation of this IS/MND.
- *Section 5- Preparers*
- *Section 6- Mitigation Monitoring and Reporting Program* (RESERVED)

1.5 - Incorporated by Reference

The following documents and/or regulations are incorporated into this IS/MND by reference:

- West Hill Master Facilities Plan 2018-2022
- City of Lemoore General Plan
- City of Lemoore 2015 Urban Water Management Plan
- City of Lemoore Master Storm Drain Plan
- 2015 Kings County Emergency Operations Plan
- Kings County General Plan (2010)
- California Title 24 Code of Regulations (2019)

SECTION 2 - PROJECT DESCRIPTION

2.1 - Introduction

The District is proposing to construct a new Instructional Center (IC) on an undeveloped but disturbed portion of the existing campus. The proposed expansion is anticipated to increase the overall student population by approximately five percent. The IC will be used to expand education opportunities in the areas of allied health services, computer science and graphic arts.

2.2 - Project Location

The proposed site is in Sections 8, Township 19 South, Range 20 East, Mount Diablo Base and Meridian, within the incorporated City of Lemoore, County of Kings, California. The project site is located on the northwest corner of Pederson Street and College Avenue, and is an approximately 27.1 acre portion of Assessor's Parcel Numbers 023-510-018, within Section 8, Township 19S, Range 20E, MMB&M. The regional location is depicted on Figure 2-1 and the project site location is depicted on Figure 2-2.

The project is within the Lemoore General Plan, which designates the project site as Community Facilities (Figure 2-3). Additionally, the project site is zoned Public Services and Community Facilities (CF). However, as a special district, the project does not fall under the jurisdiction of the Kings County Zoning Ordinance or General Plan, and therefore is not subject to land use regulations

2.3 - Project Environment

West Hills College Lemoore was constructed in 2002 and serves a student population of approximately 6,500 students (West Hills College Lemoore, 2018). Fire service would be served by the Lemoore Fire Department located at 610 Fox Street in Lemoore. Police service would be served by the City of Lemoore Police Department located at 657 Fox Street in Lemoore. Sanitation/garbage collection will be provided by a local waste hauler. Water and sewer service will be provided by City of Lemoore.

2.4 - Proposed Project

The District proposes to construct a 42,429-square-foot, two-story Instructional Center (IC) on an undeveloped but disturbed portion of the existing campus. The college has a current student enrollment of 4,600 students and the proposed expansion is anticipated to increase the overall student population by approximately five percent, or approximately 232 students. The IC will be used to expand education opportunities in the areas of allied health services, computer science and graphic arts.

Construction will include site clearing, rough and finished grading, trenching, backfill for underground facilities, and concrete for circulation surfaces. The two-story building will match existing campus standard and include steel framing, concrete floors, built up roofing over steel decking, and brick exterior finishes, metal roofing accents, and an elevator which will support future expansion. The project consists of lecture, laboratory, office and other rooms used for educational purposes.

The project will match the existing construction and space standards set by the District. Construction is expected to begin in January 2023 and end in April 2024. Construction equipment will include a crane, bulldozer, grader, bob cat, trencher, cement trucks, water trucks, trash trucks, equipment delivery trucks, and company work vehicles.

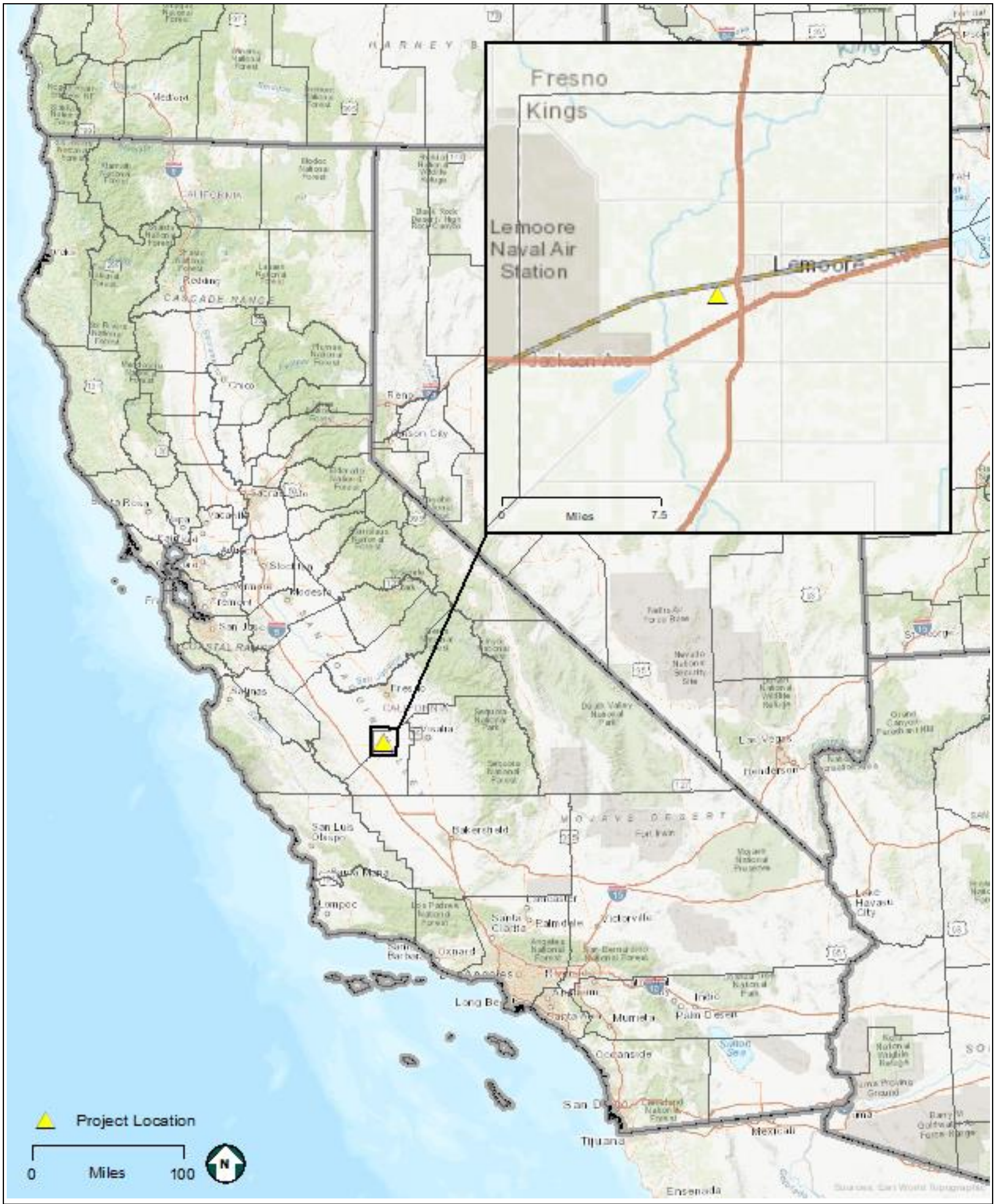

Figure 2-1
Regional Location

Figure 2-2
Project Site

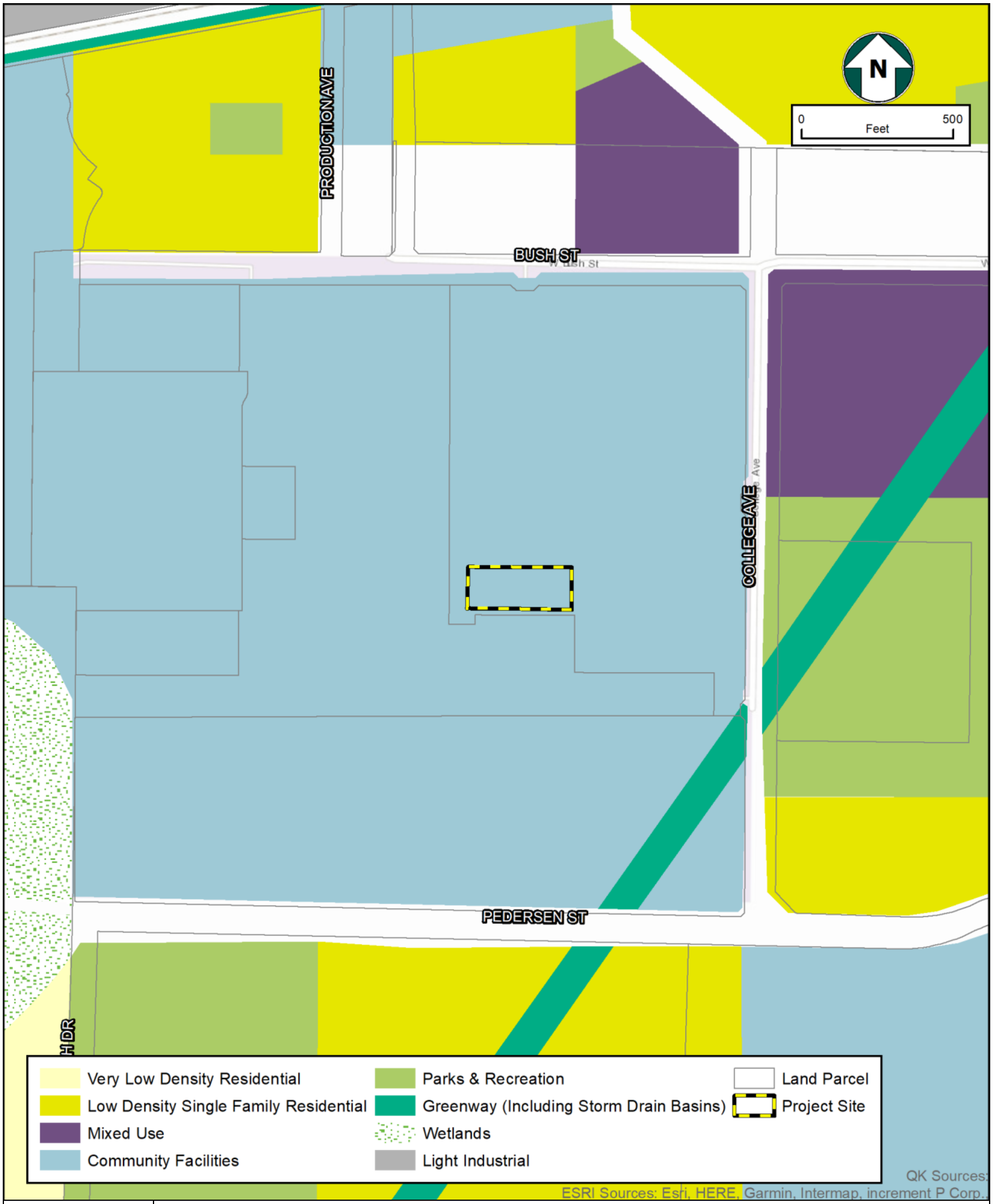

Figure 2-3
Surrounding Land Uses

SECTION 3 - EVALUATION OF ENVIRONMENTAL IMPACTS

3.1 - Environmental Checklist and Discussion

1. **Project Title:**

West Hills College Lemoore Campus Instructional Center Project

2. **Lead Agency Name and Address:**

West Hills Community College District
275 Phelps Avenue
Coalinga, CA 93210

3. **Contact Person and Phone Number:**

Richard Storti, Deputy Chancellor
Phone: (559) 934-2160

4. **Project Location:**

The project site is located on the northwest corner of Pederson Street and College Avenue in the City of Lemoore, Kings County, CA. The project site includes Assessor's Parcel Number (APN) 023-510-018, which totals approximately 27.1 acres in area.

5. **Project Sponsor's Name and Address:**

Richard Storti, Deputy Chancellor
Phone: (559) 934-2160

6. **General Plan Designation:**

Community Facilities

7. **Zoning:**

Public Services and Community Facilities (CF)

8. **Description of Project:**

See *Section 2.4 – Proposed Project*.

9. **Surrounding Land Uses and Setting:**

See *Section 2.3 – Surrounding Land Uses* and Figure 2-3.

10. Other Public Agencies Whose Approval May be Required:

- San Joaquin Valley Air Pollution Control District (SJVAPCD)
- Regional Water Quality Control Board - Central (RWQCB)
- State Water Resource Control Board (SWRCB)
- Division of the State Architect (DSA)

11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, has consultation begun?

On November 24, 2020, the Native American Heritage Commission (NAHC) conducted a search of its Sacred Lands File to identify previously recorded sacred sites or cultural resources of special importance to tribes and provide contact information for local Native American representatives who may have information about the project area. The NAHC responded on December 18, 2020, with its findings and attached a list of Native American tribes and individuals culturally affiliated with the project area. On December 10, 2020, an outreach letter was mailed or emailed to each of the contacts identified by the NAHC (Appendix C). The outreach letter and follow-up calls are considered best practices within cultural resource management. To date, no response has been received from the tribes.

NOTE: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code Section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code Section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code Section 21082.3(c) contains provisions specific to confidentiality.

3.2 - Environmental Factors Potentially Affected:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics
☐ Biological Resources
☐ Greenhouse Gas Emissions
☐ Land Use/Planning
☐ Population/Housing
☐ Transportation/Traffic
☐ Agriculture and Forest Resources
☐ Cultural Resources
☐ Hazards & Hazardous Materials
☐ Mineral Resources
☐ Public Services
☐ Utilities/Service Systems
☐ Air Quality
☐ Geology/Soils
☐ Hydrology/Water Quality
☐ Noise
☐ Recreation
☐ Findings of Significance

3.3 - Determination

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (a) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (b) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENT IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Richard Storti

Richard Storti, Deputy Chancellor

12/24/2020

Date

3.4 - Evaluation of Environmental Impacts

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2. All answers must take account of the whole action involved, including offsite as well as onsite, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4. "Negative Declaration: “Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less-Than-Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less-than-significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

    a. Earlier Analysis Used. Identify and state where they are available for review;
    b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis; and
    c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated,” describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a

previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7. Supporting Information Sources: A source list should be attached, and other sources used, or individuals contacted should be cited in the discussion.

8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9. The explanation of each issue should identify:

   a. The significance criteria or threshold, if any, used to evaluate each question; and
   b. The mitigation measure identified, if any, to reduce the impact to less than significant.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.1 - AESTHETICS					
Would the project:					
a.	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c.	In non-urbanized area, substantially degrade the existing visual character or quality of public views of the site and its surroundings? If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d.	Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Discussion

Impact #3.4.1a – Would the project have a substantial adverse effect on a scenic vista?

As seen in Figure 2-1, the project site consists of a partially undeveloped land and is surrounded by the developed existing school campus to the north, east, and south. The project site is located on the northwest corner of Pederson Street and College Avenue Lemoore, Kings County, CA.

There are no natural features or landmark buildings within the vicinity of the project site (City of Lemoore, 2008). The project is not located in an area that would result in substantial adverse effects on any scenic vistas, therefore, causing no negative impacts. Any construction-related related impacts to the visual character of the site and its surroundings would be temporary, therefore, there would be no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.1b – Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

There are no listed State scenic highways within or near the City of Lemoore, nor are there scenic highways in Kings County (California Department of Transportation, 2020). The closest eligible scenic highway is SR 41, southwest of SR 33, which is approximately 35 miles southwest of the project site. Further, the project does not include the removal of trees determined to be scenic or of scenic value, the destruction of rock outcroppings or degradation of any historic building. The project will not result in development that is substantially different than surrounding land uses. Therefore, impacts to scenic resources would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.1c – In non-urbanized area, substantially degrade the existing visual character or quality of public views of the site and its surroundings? If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

The entirety of the project will be within the existing and developed campus. The project's appearance will be similar in character to the existing buildings and would not degrade the visual character of the site or its surroundings. Therefore, the project would not result in a substantial impact to the visual quality of the area.

See also discussion of Impact #3.4.1a, above.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.1d – Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Construction of the proposed project would be temporary and generally occur during daytime hours, typically from 7:00 a.m. to 6:00 p.m. All lighting would be directed downward and shielded to focus illumination on the desired work areas only and prevent light spillage onto adjacent properties. Because lighting used to illuminate work areas would be shielded, focused downward, and turned off by 6:00 p.m., the potential for lighting to affect any residents adversely is minimal. Increased truck traffic and the transport of construction materials to the project site would temporarily increase glare conditions during construction. However, this increase in glare would be minimal. Construction activity would focus on specific areas on the sites, and any sources of glare would not be stationary for a prolonged period of time. Therefore, construction of the proposed project would not create a new source of substantial glare that would affect daytime views in the area.

Upon completion of the construction, the project will not create a new source of light and glare beyond what is already existing on the campus. Any light and glare impacts related to the construction of the proposed project would be temporary, therefore, the project would have a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

3.4.2 - AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a.	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	☐	☐	☐	☒
b.	Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	☒
c.	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d.	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e.	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to nonagricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion

Impact #3.4.2a – Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?

The proposed project will not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. According to the Department of Conservation's Farmland Mapping and Monitoring Program (FMMP), the project site is classified as “Urban and Built-Up Land” (Figure 3.4.2-1), which is defined as:

- Urban and Built-Up Land - Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

The site also is not currently used for farming and is not zoned for agricultural use. Considering these factors, the proposed project will have no impact on conversion of agricultural resources.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact.***

Impact #3.4.2b – Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

See response to Impact #3.4.2a.

According to the City of Lemoore’s Zoning Ordinance, the project site’s zoning classification is Public Services and Community Facilities. The project site is not subject to a Williamson Act contract and would not conflict with any current Williamson Act contracted land in the vicinity. Therefore, the project will not conflict with existing zoning for agricultural use or a Williamson Act contract.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact.***

Impact #3.4.2c – Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

According to the City of Lemoore Zoning Map, the project site and the adjacent properties are not zoned for forest land or timberland. The site will remain as Community Facilities land use designation. The project will have no impact on land designated for forest land or timberland use.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.2d – Would the project result in the loss of forest land or conversion of forest land to non-forest use?

See discussion of Impact #3.4.2c, above.

The proposed project will have no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.2e – Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to nonagricultural use or conversion of forest land to non-forest use?

See discussion of Impact #3.4.2c, above.

The proposed project will have no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

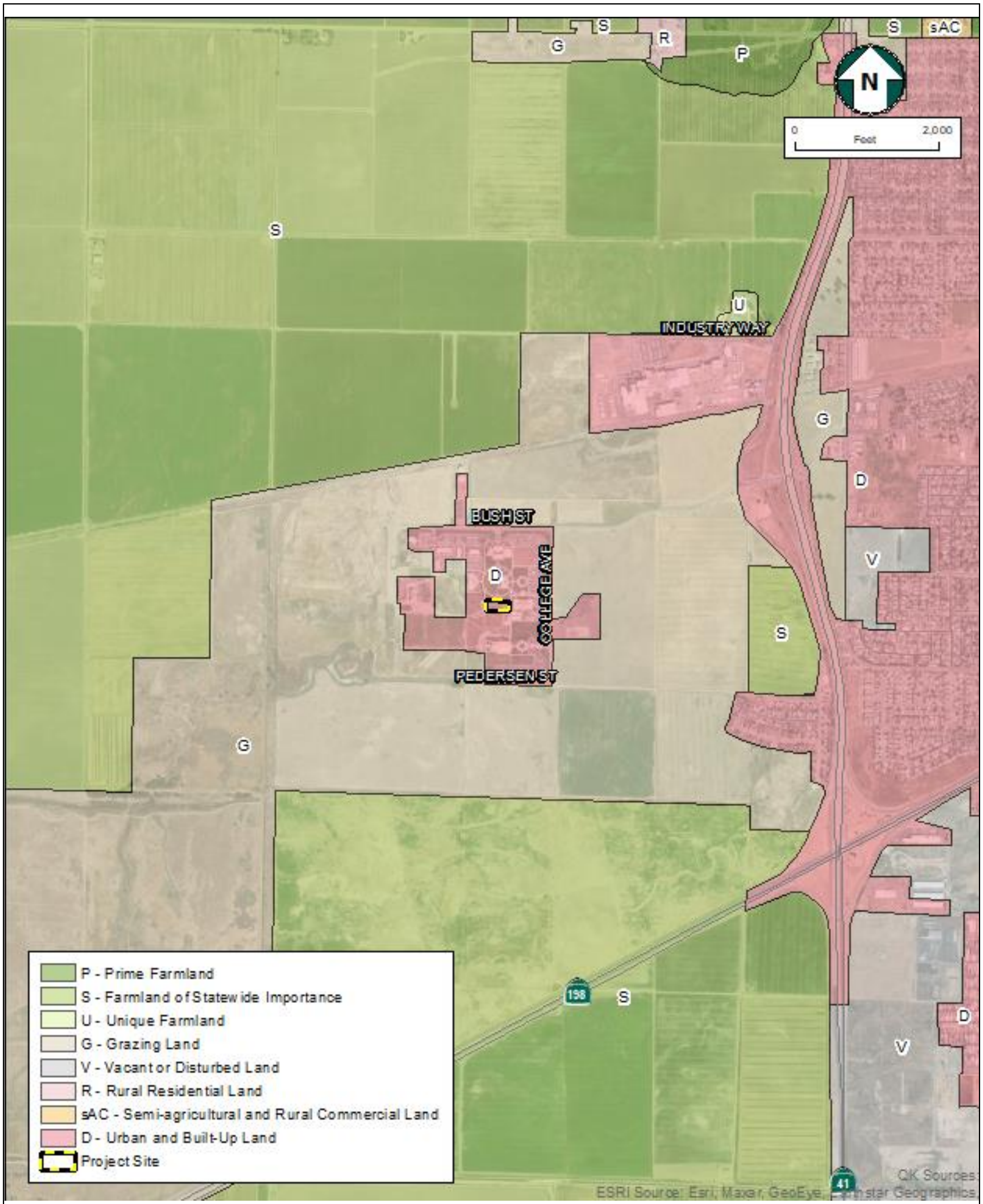

Figure 3.4.2-1
Farmland Mapping and Monitoring Program (FMMP)

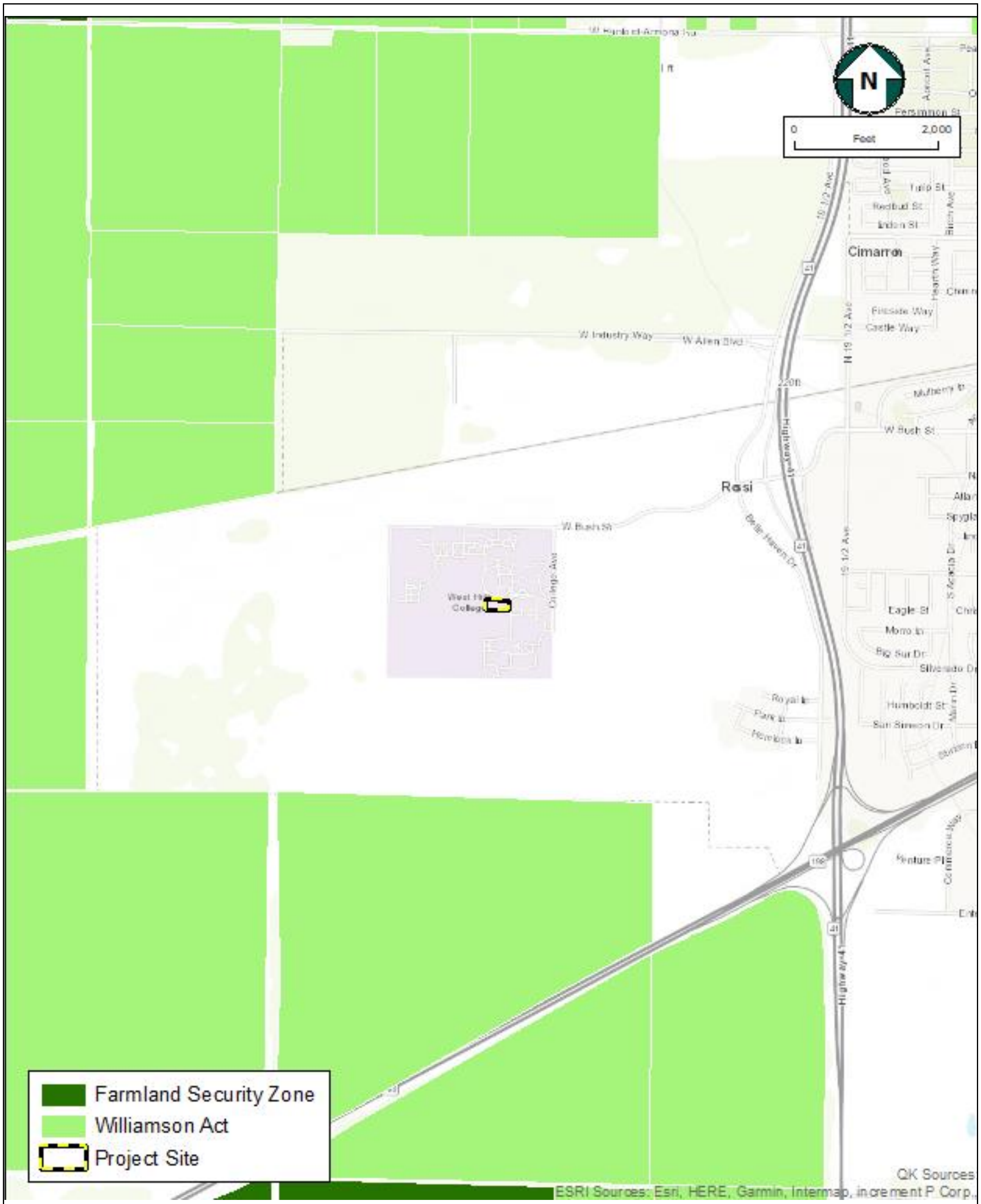

Figure 3.4.2-2
Williamson Act Contracts

3.4.3 - AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a.	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard?	☐	☐	☒	☐
c.	Expose sensitive receptors to substantial pollutant concentration?	☐	☐	☒	☐
d.	Result in other emissions (such as those leading to odor) adversely affecting a substantial number of people?	☐	☐	☒	☐

.

Discussion

The analysis below is based on a Small Project Analysis Level Assessment (SPAL) prepared for the Project (Trinity Consultants, 2020). The SPAL is included in this document as Appendix A.

Impact #3.4.3a – Would the project conflict with or obstruct implementation of the applicable air quality plan?

The project is located within the San Joaquin Valley Air Basin (SJVAB), which and under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAB is designated nonattainment of State and federal health-based air quality standards for ozone and $PM_{2.5}$. The SJVAB is designated nonattainment of State PM_{10}. To meet Federal Clean Air Act (CAA) requirements, the SJVAPCD has multiple air quality attainment plan (AQAP) documents, including:

- 2016 Ozone Plan;
- 2007 PM_{10} Maintenance Plan and Request for Redesignation; and
- 2016 $PM_{2.5}$ Plan.

The SJVAPCD's Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI) thresholds are designed to implement the general criteria for air quality emissions as required in the CEQA Guidelines, Appendix G, Paragraph III (Title 14 of the California Code of Regulations §15064.7) and CEQA (California Public Resources Code Sections 21000 et. al). SJVAPCD's specific CEQA air quality thresholds are presented in Table 3.4.3-1.

Table 3.4.3-1
GAMAQI Thresholds of Significance for Criteria Pollutants

Criteria Pollutant	Threshold (tons/year)
CO	100
ROG	10
NOx	10
SOx	27
PM_{10}	15
$PM_{2.5}$	15

(San Joaquin Air Pollution Control District, 2015)

The project's anticipated construction duration for the proposed project is approximately 15 months. Stationary sources that comply or that would comply with Air District Rules and Regulations are generally not considered to have a significant air quality impact.

During construction, the proposed project would be subject to Regulation VIII (Fugitive PM_{10} Prohibition) of the SJVAPCD. The purpose of Regulation VIII is to reduce ambient concentrations of fine particulate matter (PM_{10}) by requiring actions to prevent, reduce or mitigate anthropogenic fugitive dust emissions. Regulation VIII would require fugitive dust emission controls at the construction site such as water application, dust suppressants, reduced vehicle speeds on unpaved roads (SJVAPCD, 2017).

The SJVAPCD Small Project Analysis Level (SPAL) process established review parameters to determine whether a project qualifies as a "small project." A project that is found to be "less than" the established parameters, according to the SPAL review parameters, has "no possibility of exceeding criteria pollutant emissions thresholds."

As shown in Table 3.4.3-2, the proposed project would not exceed the established SPAL limits for an educational project. The project would construct a 42,429-square-foot Instructional Center compared to the allowable project size for junior college project, which is 74,400 square feet. Based on the above information, this project qualifies for a limited air quality analysis applying the SPAL guidance to determine air quality impacts.

Table 3.4.3-2
Small Project Analysis Level – Units for Educational

Land Use Category –Educational	Project Size (square feet)
Elementary	156,000
Junior High School	168,000
High School	153,600
Junior College (2 year)	74,400
University/College (4 year)	1,200 students
Library	38,400
Place of Worship	141,000
Proposed Project – Junior College	42,000
SPAL Exceeded?	**No**

Source: (Trinity Consultants, 2020)

Table 3.4.3-3
Small Project Analysis Level – Daily Trips for Educational Institutions

Land Use Category –Educational	Average Daily Trips (non-HHD)	Average Daily Trips (HHD)*
Elementary	1,000	15
Junior High School		
High School		
Junior College (2 year)		
University/College (4 year)		
Library		
Place of Worship		
Proposed Project – Junior College	997	15
SPAL Exceeded?	**No**	**No**

Source: (Trinity Consultants, 2020)

As shown in Table 3.4.3-3, the proposed project would not exceed the established SPAL limits for a “Junior College” educational project. The project would include 997 additional daily trips for all vehicle types except HHD and 15 additional daily trips for HHD vehicles. The SPAL threshold for HHD trips is based on a 50-mile trip length. The HHD trips for the proposed project are based on a 47.6-mile trip length. Construction and operation of the proposed project would not exceed any established SJVAPCD thresholds; therefore, impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.3b – Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The nonattainment pollutants for the SJVAPCD are ozone, PM_{10} and $PM_{2.5}$. Therefore, the pollutants of concern for this impact are ozone precursors, and regional PM_{10}, and $PM_{2.5}$. As discussed above, the thresholds of significance used for determination of emission significance are shown in Table 3.4.3-1 above. The proposed project would create NOx and PM_{10} emissions during construction, which would contribute to the current nonattainment status of these pollutants within the SJVAB. As noted in Impact #3.4.3a, the project's emissions during temporary construction activities would not exceed thresholds.

Operation of the project would also create additional criteria pollutants, particularly as a result of increased mobile emissions in the project area. However, these impacts also would not exceed thresholds.

Because project construction at the project site would not result in significant emissions for which the SJVAPCD and surrounding air districts are in nonattainment, construction emissions would not result in a cumulatively considerable net increase. Further, as the proposed project would not result in significant operational emissions of criteria pollutants, the proposed project would not contribute to a long-term cumulative increase in criteria pollutants.

Construction

Construction is expected to begin in January 2023 and end in April 2024. Project construction emissions of NOx and PM_{10} were calculated using default CalEEMod factors for construction of a new 42,000-square-foot, two-story Instruction Center on an undeveloped but disturbed portion of the existing campus (see Appendix A).

The primary source of NOx is off-road diesel construction equipment and on-road diesel emissions during hauling activities. The primary source of PM_{10} is from site preparation and grading activities. Table 3.4.3-4 shows construction emission levels do not exceed the SJVAPCD localized emission screening thresholds and would therefore have a less-than-significant impact from localized criteria pollutant emissions.

Table 3.4.3-4
Construction Emissions

Emissions Source	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
	(tons/year)					
2023 Construction Emissions	0.10	0.91	1.01	0.0002	0.08	0.05
2024 Construction Emissions	0.31	0.20	0.25	0	0.02	0.01
SJVAPCD Construction Emissions Thresholds	10	10	100	27	15	15
Is Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: NO_X = nitrogen oxides, PM_{10} = particulate matter
Source: **(Trinity Consultants, 2020)**

As seen in Table 3.4.3-4, emissions from the project are below the SJVAPCD's thresholds.

Operation

Operational emissions occur over the lifetime of the project generated from mobile, energy, and area sources as well as from water use and waste generation emissions. Operational emissions are presented in Table 3.4.3-5. The results of the analysis show that emissions are below the annual emission thresholds for each pollutant.

Table 3.4.3-5
Total Project Operational Emissions

Emissions Source	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
	(tons/year)					
Unmitigated						
Operational Emissions	0.38	2.38	2.00	0.01	0.87	0.24
SJVAPCD Operational Emissions Thresholds – non-permitted sources	10	10	100	27	15	15
Is Threshold Exceeded Before Mitigation?	**No**	**No**	**No**	**No**	**No**	**No**
Mitigated						
Operational Emissions	0.38	2.34	1.91	0.01	0.81	0.22
SJVAPCD Operational Emissions Thresholds – non-permitted sources	10	10	100	27	15	15
Is Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: NO_X = nitrogen oxides, PM_{10} = particulate matter
Source: (Trinity Consultants, 2020)

The long-term operational emissions associated with the proposed project would be less than SJVAPCD significance threshold levels and would, therefore, not pose a significant impact to criteria air pollutants. This finding is consistent with the SPAL screening thresholds. The project would not exceed SJVAPCD daily operational screening thresholds and would result in less-than-significant localized impacts.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.3c – Would the project expose sensitive receptors to substantial pollutant concentrations?

The proposed project is located near the southwest corner of Bush Street and College Avenue. Sensitive receptors are defined as areas where young children, chronically ill individuals, the elderly, or people who are more sensitive than the general population reside. Schools, hospitals, nursing homes and daycare centers are locations where sensitive receptors would likely reside. There are currently sensitive receptors at the existing Lemoore University Elementary Charter and Lemoore Middle College High School located on the proposed project site. There are no other known schools, hospitals, or nursing homes within a one-mile radius of the project.

Based on the predicted operational emissions and activity types, the proposed Project is not expected to affect any on-site or off-site sensitive receptors and is not expected to have any adverse impacts on any known sensitive receptor.

The proposed project once constructed is not expected to result in the generation of odors or other hazardous air pollutants. However, during construction of the project, construction activities and equipment may generate emission from construction equipment exhaust. These impacts are localized and temporary in nature and therefore are considered less than significant. The project would not expose sensitive receptors to substantial concentrations of localized PM_{10}, carbon monoxide, diesel particulate matter, hazardous air pollutants, or naturally occurring asbestos, as discussed below.

Hazardous Pollutants or Odors

The GAMAQI guidelines introduce two types of projects that should be assessed when considering hazardous air pollutants (HAPs) which includes: (1) placing a toxic land use in an area where it may have an adverse health impact on an existing sensitive land use and (2) placing a sensitive land use in an area where an adverse health impact may occur from an existing toxic land use. Some examples of projects that may include HAPs are:

- Agricultural products processing;

- Bulk material handling;
- Chemical blending, mixing, manufacturing, storage, etc.;
- Combustion equipment (boilers, engines, heaters, incinerators, etc.);
- Metals etching, melting, plating, refining, etc.;
- Plastics & fiberglass forming and manufacturing;
- Petroleum production, manufacturing, storage, and distribution; and
- Rock & mineral mining and processing.

The proposed project is located on a site that is currently undeveloped but disturbed land. During the construction period some odors could result from vehicles and equipment using diesel fuels. However, vehicles and equipment using diesel fuels at the proposed project would have to comply with the California Air Resources Board (CARB) guidelines, which limit idling time to five minutes with the Airborne Toxic Control Measure (ATCM). All construction would be temporary. The project is not expected to expose sensitive receptors to substantial pollutant concentrations. Therefore, impacts will be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.3d – Would the project result in emissions (such as those leading to odors) adversely affecting a substantial number of people?

Sensitive receptors include locations where young children, chronically ill individuals, the elderly, or people who are more sensitive than the general population reside, such as schools, hospitals, nursing homes, and daycare centers. The Lemoore Elementary Charter School is located in close proximity to the project site. Although emissions from construction-related vehicles are anticipated during temporary construction activities, the proposed project is not expected to affect these sensitive receptors. Construction equipment will be used during limited times and of short duration and is not anticipated to generate significant amounts of emissions.

As discussed in Impact #3.4.3c, above. The residential nature of this project is not expected to result in the generation of odors or hazardous air pollutants that would affect a substantial number of people. The emissions associated with the construction of the project would be temporary in nature and are not anticipated to result in the generation of a substantial amount of hazardous air pollutants. Therefore, the project will have a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.4 - BIOLOGICAL RESOURCES				
Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c. Have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f. Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☒	☐

Discussion

The biological resources evaluation is based upon a review of available literature and databases and existing site conditions evaluated during a reconnaissance survey. These studies evaluated the potential for sensitive biological resources to occur on and in the vicinity of the project, and any impacts that could potentially occur.

Reviews of the California Department of Fish and Wildlife's California Natural Diversity Database (California Department of Fish and Wildlife, 2020), the California Native Plant Society's Rare Plant Program Inventory (California Native Plant Society, 2020), and the United States Fish and Wildlife Service's Information for Planning and Consultation online tool (US Fish and Wildlife Service, 2020) were conducted to identify special-status plant and wildlife species with the potential to occur within the project and in the vicinity of the project (the *Lemoore* 7.5" USGS quadrangle, within which the project is situated, and the surrounding eight quads). Information regarding the presence of Critical Habitat in the project vicinity was obtained from the United States Fish and Wildlife Service's Critical Habitat Mapper database (USFWS, 2020b). The results of the database inquiries were reviewed to evaluate the potential for occurrence of special-status species and other sensitive biological resources known to occur on or near the project site prior to conducting the biological reconnaissance survey.

On December 1, 2020, QK biologist Shannon Gleason conducted a biological reconnaissance survey of the project and accessible areas within 250 feet (Survey Area). Meandering pedestrian transects were walked through the Survey Area to achieve 100 percent visual coverage, with the aid of binoculars. The purpose of the survey was to determine the presence and extent of existing plant communities and any sensitive habitats, the presence and potential for occurrence of special-status plant and animal species, and to identify any other sensitive biological resources within the Survey Area. Protocol surveys for specific special-status wildlife species were not conducted. Locations of sensitive biological resources were documented using the ArcGIS Collector application installed on an iPad. Photographs were taken to document the existing landscape and sensitive biological resources; detailed notes on observed plant and wildlife species and site conditions were taken while conducting the survey.

General Site Conditions

The project area is within the footprint of the West Hills College Lemoore campus, which was constructed in 2002. Prior to the development of the campus, the land on which it is situated was used for agriculture. The campus is located in the San Joaquin Valley, most of which has been developed for agricultural and urban use. The West Hills College Lemoore campus has been developed with numerous permanent buildings and semi-permanent modular buildings, parking lots, manicured lawns, sidewalks, and soccer fields. There is a freshwater pond just west of the southwest corner of the campus (outside of the Survey Area) that is surrounded by native habitat. The project site is located between existing buildings. There is a small pile of concrete rubble and some short open-ended pipes in the Survey Area buffer west of the project site. Southwest of the project there are two small seatrains and another open-ended pipe.

Some of the campus has not yet been developed and supports non-native grassland habitat, which consists mainly of ruderal plant species such as red brome (*Bromus madritensis* ssp. *rubens*), annual burweed (*Ambrosia acanthicarpa*), and Russian thistle (*Salsola tragus*). Seepweed (*Saueda nigra*) was also found in this natural habitat where the ground was slightly depressed. The natural habitat is found in some of the Survey Area buffer west and south of the project site. Plant species found in the developed areas of the campus include Bermuda grass (*Cynodon dactylon*), common groundsel (*Senecio vulgaris*), oleander (*Nerium oleander*), and various ornamental species.

A gravel road bisects the project site into two halves. The northern half of the project site is covered by a Bermuda grass lawn. The southern half is vegetated by red brome, Bermuda grass, pigweed amaranth (*Amaranthus albus*), and Russian thistle, all of which was dead and dry at the time of the survey, and appears to be routinely cut to control growth.

The wildlife species observed during the survey were typical of urban and grassland habitats. Most of the bird species observed were detected on the west side of the Survey Area where there is undeveloped habitat. A desert cottontail (*Sylvilagus audubonii*) was also observed in this area. Several gopher (*Thomomys bottae*) mounds were observed south of the project site. There were very few small mammal burrows in the Survey Area; a few were observed in the southeastern corner of the project site where there is compacted soil, and these were in very poor condition and did not appear active. There are modular buildings in the southeastern corner of the Survey Area, and there are multiple gaps under these buildings that would allow wildlife to enter the crawlspace underneath the buildings.

There were 17 plant species, six bird species, and two mammal species identified during the reconnaissance survey, either through direct observation or by the presence of diagnostic signs (Table 3.4.4-1). None of these species are listed under the federal or California Endangered Species Acts.

Impact Analysis

This section describes the results of the database searches and, using conditions present on the project as determined by the reconnaissance survey, provides an analysis of project impacts on each of six biological evaluation criteria. Each of the biological evaluation criteria were determined to be in one of three categories: less-than-significant impacts with mitigation incorporated, less-than-significant impacts, and no impacts. Each of the evaluation criteria are discussed below and mitigation measures are provided as warranted to, when implemented, reduce impacts to below significant levels.

Impact #3.4.4a – Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?

The literature search indicated that there is potential for several special-status species to be present on or in the vicinity of the project. An evaluation of each of the potential special-status species, which included habitat requirements, likelihood of required habitat to occur within the project area, and a comparison to the CNDDB records was conducted. The results of this evaluation concluded that nine plant, one natural community, and12 wildlife species with special status have a reasonable potential to occur on or near the project.

Table 3.4.4-1
List of Plant and Wildlife Species Observed on the Project Site

Scientific name	Common name
Plants	
Amaranthus albus	pigweed amaranth
Ambrosia acanthicarpa	annual burweed
Bromus madritensis ssp. *rubens*	red brome
Chenopodium sp.	goosefoot
Cynodon dactylon	Bermuda grass
Erigeron canadensis	horseweed
Heterotheca grandiflora	telegraph weed
Malva parviflora	cheeseweed
Nerium oleander	oleander
Phalaris sp.	canarygrass
Salsola tragus	Russian thistle
Senecio vulgaris	common groundsel
Sorghum halepense	johnsongrass
Suaeda nigra	seepweed
Taraxicum officinale	common dandelion
Trifolium hirtum	rose clover
Washingtonia filifera	California fan palm
	various ornamental
Wildlife	
Anthus rubescens	American pipit
Charadrius vociferus	killdeer
Corvus corax	common raven
Eremophila alpestris	horned lark
Mimus polyglottos	northern mockingbird
Sturnella neglecta	western meadowlark
Sylvilagus audubonii	desert cottontail
Thomomys bottae	Botta's pocket gopher*

*Indicates that only sign of the species (e.g., scat, tracks, burrows) was observed.

Special-Status Species

SPECIAL-STATUS PLANT SPECIES

Based on the survey and database queries, there are seven special-status plant species that have the potential to occur within the subject quadrangle and eight surrounding quadrangles: brittlescale (*Atriplex depressa*), recurved larkspur (*Delphinium recurvatum*), vernal barley (*Hordeum intercedens*), alkali sink goldfields (*Lasthenia chrysantha*), Panoche peppergrass (*Lepidium jaredii* ssp. *album*), mud nama (*Nama stenocarpa*), and California alkali grass (*Puccinellia simplex*). There are CNDDB records for 6 of these species within the 9-quad query; there is no record for vernal barley.

The project site is within the current college campus footprint, which was historically disturbed by agricultural practices. None of the sensitive-plant species were observed during the survey, although the survey was not conducted during the blooming periods of any of the species. The project site currently consists of non-native Bermuda grass lawn and non-native grassland, both of which are routinely maintained and would not support any of the special-status species listed above. The non-native grassland in the Survey Area buffer west of the project is not routinely maintained and could potentially support brittlescale, recurved larkspur, vernal barley, Panoche peppergrass, and California alkali grass; it does not provide suitable habitat for alkali sink goldfields or mud nama. However, all project activities will be restricted to previously disturbed and routinely maintained areas that would not support these species. Thus, no protective measures for special-status plant species are warranted.

SENSITIVE WILDLIFE SPECIES

Based on the database queries there were 22 special-status wildlife species that were identified as having a potential to occur within the subject quadrangle and eight surrounding quadrangles. Nineteen of these species were eliminated from consideration due to the lack of suitable habitat. California red-legged frog (*Rana draytonii*), delta smelt (*Hypomesus transpacificus*), giant garter snake (*Thamnophis gigas*), western pond turtle (*Emys marmorata*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), western ridged mussel (*Gonidea angulata*), and western spadefoot (*Spea hammondii*) are dependent upon water bodies and/or vernal pools, which are not present within the Survey Area. There were no CNDDB records for California red-legged frog, delta smelt, vernal pool fairy shrimp, or vernal pool tadpole shrimp in the 9-quad database query. Hoary bat (*Lasiurus cinereus*) roosts in dense foliage of medium to large trees, typically in forests, which were not present on or near the project. There are no elderberry shrubs (*Sambucus* sp.) in the Survey Area so valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) would not be present. San Joaquin tiger beetle (*Cicindela tranquebarica joaquinensis*) is highly associated with sandy soils, which are not present in the Survey Area. There is no suitable nesting or foraging habitat for black-crowned night heron (*Nycticorax nycticorax*), tricolored blackbird (*Agelaius tricolor*), western snowy plover (*Charadrius alexandrinus* nivosus), or yellow-headed blackbird (*Xanthocephalus xanthocephalus*), which require wetlands, marshes, dry lakes, or sandy beaches. There are no burrows suitable for blunt-nosed leopard lizard (*Gambelia sila*) or California glossy snake (*Arizona elegans occidentalis*) and the non-native grassland habitat in the Survey Area is only marginally acceptable for these species. No kangaroo rat burrows were observed during the survey and the non-native grassland habitat is only marginally acceptable for Fresno kangaroo rat (*Dipodomys nitratoides exilis*) and Tipton kangaroo rat (*D. n. nitratoides*). American badger (*Taxidea taxus*) did not result from the 9-quad queries and is now a very uncommon species to encounter in agricultural and residential areas of the California Central Valley; there is no suitable habitat for the species in the project area.

The remaining three species resulting from the database queries have the potential to occur within the project site and vicinity: burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsonsi*), and San Joaquin kit fox (*Vulpes macrotis mutica*). Nesting birds protected by the federal Migratory Bird Treaty Act (MBTA) may also be present during the breeding season.

San Joaquin Kit Fox

San Joaquin kit fox, a federally Endangered and State Threatened species, has potential to occur in the habitat surrounding the project, but is unlikely to be present within the project footprint. The nearest CNDDB record for the species is from 2002 and approximately 2.1 miles northwest of the project, documenting one San Joaquin kit fox that was observed in a fallow agricultural field during a spotlighting effort (EONDX 66434). The non-native grassland present in the Survey Area buffer provides moderate quality habitat, although there were very few small mammal burrows and the natural prey base is likely limited. However, San Joaquin kit foxes are known to adapt well to urban and residential areas and scavenge anthropogenic foods, which may be available at the college campus. No natural kit fox dens or any sign of the species were observed during the survey. Some of the modular buildings in the southeast corner of the Survey Area buffer have gaps underneath them and kit foxes could potentially den under these buildings. Multiple open-ended PVC pipes were found in the buffer which could provide temporary shelter to kit foxes.

San Joaquin kit foxes are known to be in the region and to adapt well to human presence, so the species could be present on or near the project as a transient or become an established resident at any time. Because the project supports only marginal habitat and is a small area, development of the project area would not result in a significant loss of habitat for the species. If the species were to be present during construction activities individual San Joaquin kit foxes could be injured or killed, or normal reproductive or foraging behaviors could be affected.

Swainson's Hawk

Swainson's hawk (*Buteo swainsoni*) is a State Threatened species and has potential to occur in the habitat around the project, but it unlikely to be present within the project footprint. Swainson's hawks forage in agricultural fields, shrublands, and grasslands, and typically nest in scattered trees or small groves. The project is surrounding by suitable foraging habitat, but the trees present on the college campus provide only marginal nesting habitat. No suitable nests were observed on the project site or surrounding area. The nearest CNDDB occurrence is 4.6 miles northwest of the project, where one or a pair of Swainson's hawks was exhibiting breeding behavior in March 2016 (EONDX 115241).

The project footprint contains very marginal habitat for Swainson's hawk and there is a limited prey base for the species in the Survey Area. The planted trees at the college campus provide marginal nesting habitat. No trees will be removed as a result of the project. Because the project supports only marginal foraging habitat and is a small area, development of the project area would not result in a significant loss of habitat for the species. Swainson's hawk is unlikely to be nesting on the college campus, and there are no suitable nesting trees within 0.5 miles of the campus. However, if the species were to be nesting within 0.5 miles of the project during construction activities, normal reproductive or foraging behaviors could be affected.

Burrowing Owl

Burrowing owl (*Athene cunicularia*), a CDFW Species of Special Concern, has a very low potential to occur within the project, but may be found in the surrounding habitat. The nearest CNDDB record is approximately 4.7 miles southwest of the project, where a nesting burrowing owl was observed at the Lemoore Naval Air Station when routine surveys were conducted in 2000. This species is unlikely to occur within the project area but may be found in the surrounding habitat. Burrowing owls could potentially occupy the gaps beneath modular homes

Because the project supports only marginal habitat for burrowing owl and is a small area, development of the project area would not result in a significant loss of habitat for the species. If the species were to be present during construction activities individual burrowing owls could be injured or killed, or normal reproductive or foraging behaviors could be affected.

Nesting Migratory Birds

Migratory bird species are protected under the federal MBTA. No active or inactive bird nests were observed during the survey, which was conducted outside of the typical avian breeding season (February 1 – September 30). The project and surrounding vicinity provide suitable nesting habitat for a variety of bird species which may nest in tree branches and cavities, shrubs, man-made structures, and directly on the ground. If nesting migratory birds are in the vicinity of the project during construction activities, individual birds could be injured or killed, or normal reproductive or foraging behaviors could be affected.

CONCLUSION

The project footprint occurs within the existing West Hills College Lemoore campus, which has been repeatedly disturbed and built upon since the college campus was built in 1981. The project and surrounding areas support mainly non-native grasses and other ruderal or ornamental species.

No special-status plant or wildlife species or their sign were observed during the survey.

It is very unlikely that any special-status plant species occur in the project area or in the vicinity due to historic agricultural development and the current vegetation maintenance regimen. No minimization, avoidance, or mitigation measures related to special status plants is warranted.

There is the potential for some special-status or protected wildlife species to be impacted by project activities. Mitigation Measures MM BIO-1 through MM BIO-8, as provided below, would protect, avoid, and minimize impacts to special-status wildlife species. When implemented, these measures would reduce impacts to these species to levels that are less than significant.

Through implementation of the mitigation measures listed below, impacts of the proposed project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service. Therefore, the project will have a less-than-significant impact with incorporation of mitigation measures.

MITIGATION MEASURE(S)

MM BIO-1: Prior to ground disturbing activities, a qualified wildlife biologist shall conduct a biological clearance survey between 14 and 30 days prior to the onset of construction.

The clearance survey shall include walking transects to identify presence of San Joaquin kit fox, Swainson's hawk, and burrowing owl and any other special-status species and their sign. The pre-construction survey shall be walked by no greater than 30-foot transects for 100 percent coverage of the project and a 250-foot buffer, where feasible. If no evidence of special-status species is detected, no further action is required but measures BIO-4 through BIO-6 and BIO-8 shall be implemented.

MM BIO-2: The following avoidance and minimization measures shall be implemented during all phases of the project to reduce the potential for impact from the project. They are modified from the *U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered SJKF Prior to or During Ground Disturbance* (USFWS 2011, Appendix F).

a. All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers. All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers and removed at least once a week from the construction or project site.
b. Construction-related vehicle traffic shall be restricted to established roads and predetermined ingress and egress corridors, staging, and parking areas. Vehicle speeds shall not exceed 20 miles per hour (mph) within the project site.
c. To prevent inadvertent entrapment of kit fox or other animals during construction, the contractor shall cover all excavated, steep-walled holes or trenches more than two feet deep at the close of each workday with plywood or similar materials. If holes or trenches cannot be covered, one or more escape ramps constructed of earthen fill or wooden planks shall be installed in the trench. Before such holes or trenches are filled, the contractor shall thoroughly inspect them for entrapped animals. All construction-related pipes, culverts, or similar structures with a diameter of four inches or greater that are stored on the project site shall be thoroughly inspected for wildlife before the pipe is subsequently buried, capped, or otherwise used or moved in anyway. If at any time an entrapped or injured kit fox is discovered, work in the immediate area shall be temporarily halted and USFWS and CDFW shall be consulted.

d. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the USFWS and CDFW have been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
e. No pets, such as dogs or cats, shall be permitted on the project sites to prevent harassment, mortality of kit foxes, or destruction of dens.
f. Use of anti-coagulant rodenticides and herbicides in project sites shall be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the USFWS and CDFW. If rodent control must be conducted, zinc phosphide shall be used because of the proven lower risk to kit foxes.
g. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative shall be identified during the employee education program and their name and telephone number shall be provided to the USFWS.
h. The Sacramento Fish and Wildlife Office of USFWS and CDFW shall be notified in writing within three working days of the accidental death or injury to a SJKF during project-related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, at the addresses and telephone numbers below. The CDFW contact can be reached at (559) 243-4014 and R4CESA@wildlifeca.gov.
i. All sightings of the SJKF shall be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed shall also be provided to the Service at the address below.
j. Any project-related information required by the USFWS or questions concerning the above conditions, or their implementation may be directed in writing to the U.S. Fish and Wildlife Service at: Endangered Species Division, 2800 Cottage Way, Suite W 2605, Sacramento, California 95825-1846, phone: (916) 414-6620 or (916) 414-6600.
k. New sightings of SJKF should be reported to the CNDDB.

MM BIO-3: Within 14 days prior to the start of project ground-disturbing activities, a pre-activity survey with a 500-foot buffer shall be conducted by a qualified biologist knowledgeable in the identification of these species and approved by the CDFW. If dens/burrows that could support any of these species are discovered during the pre-activity survey conducted under MM BIO-1, the avoidance buffers outlined below should be established. No work would occur within these buffers unless the biologist approves and monitors the activity.

Burrowing Owl (active burrows)

- Non-breeding season: September 1 – January 31 – 160 feet
- Breeding season: February 1 – August 31 – 250 feet

San Joaquin Kit Fox

- Potential or Atypical den – 50 feet
- Known den – 100 feet
- Natal or pupping den – 500 feet, unless otherwise specified by CDFW

MM BIO-4: If all project activities are completed outside of the Swainson's hawk nesting season (February 15 through August 31), this mitigation measure may be disregarded.

Nesting surveys for the Swainson's hawks shall be conducted in accordance with the protocol outlined in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (CDFG 2000). If potential Swainson's hawk nests or nesting substrates are located within 0.5 miles of the project site, then those nests or substrates must be monitored for activity on a routine and repeating basis throughout the breeding season, or until Swainson's hawks or other raptor species are verified to be using them. The protocol recommends that the following visits be made to each nest or nesting site: one visit during January 1–March 20 to identify potential nest sites, three visits during March 20–April 5, three visits during April 5–April 20, and three visits during June 10–July 30. A fewer number of visits may be permissible if deemed adequate by the City after consultation with a qualified biologist. To meet the minimum level of protection for the species, surveys shall be completed for at least the two survey periods immediately prior to project-related ground disturbance activities. If Swainson's hawks are not found to nest within the survey area, then no further action is warranted.

MM BIO-5: If an active Swainson's hawk nest is discovered at any time within 0.5 miles of active construction, a qualified biologist shall complete an assessment of the potential for current construction activities to impact the nest. The assessment will consider the type of construction activities, the location of construction relative to the nest, the visibility of construction activities from the nest location, and other existing disturbances in the area that are not related to construction activities of this project. Based on this assessment, the biologist shall determine if construction activities can proceed and the level of nest monitoring required. Construction activities shall not occur within 500 feet of an active nest but depending upon conditions at the site this distance may be reduced. Fulltime monitoring to evaluate the effects of construction activities on nesting Swainson's hawks may be required. The qualified biologist shall have the authority to stop work if it is determined that project construction is disturbing the nest. These buffers may need to increase depending on the sensitivity of the nest location, the sensitivity of the nesting Swainson's hawk to disturbances, and at the discretion of the qualified biologist.

MM BIO-6: If construction is planned outside the nesting period for raptors (other than burrowing owl) and migratory birds (February 15 to August 31), no mitigation shall be required. If construction is planned during the nesting season for migratory birds and raptors, a preconstruction survey to identify active bird nests shall be conducted by a qualified biologist to evaluate the site and a 250-foot buffer for migratory birds and a 500-foot buffer for raptors. If nesting birds are identified during the survey, active raptor nests shall be avoided by 500 feet and all other migratory bird nests shall be avoided by 250 feet. Avoidance buffers may be reduced if a qualified on-site monitor determines that encroachment into the buffer area is not affecting nest building, the rearing of young, or otherwise affecting the breeding behaviors of the resident birds. Because nesting birds can establish new nests or produce a second or even third clutch at any time during the nesting season, nesting bird surveys shall be repeated every 30 days as construction activities are occurring throughout the nesting season.

No construction or earth-moving activity shall occur within a non-disturbance buffer until it is determined by a qualified biologist that the young have fledged (left the nest) and have attained sufficient flight skills to avoid project construction areas. Once the migratory birds or raptors have completed nesting and young have fledged, disturbance buffers will no longer be needed and may be removed, and monitoring may cease.

MM BIO-7: A qualified biologist shall conduct a pre-construction survey on the project site and within 500 feet of its perimeter, where feasible, to identify the presence of the western burrowing owl. The survey shall be conducted between 14 and 30 days prior to the start of construction activities. If any burrowing owl burrows are observed during the preconstruction survey, avoidance measures shall be consistent with those included in the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). If occupied burrowing owl burrows are observed outside of the breeding season (September 1 through January 31) and within 250 feet of proposed construction activities, a passive relocation effort may be instituted in accordance with the guidelines established by the California Burrowing Owl Consortium (1993) and the California Department of Fish and Wildlife (2012). During the breeding season (February 1 through August 31), a 500-foot (minimum) buffer zone shall be maintained unless a qualified biologist verifies through noninvasive methods that either the birds have not begun egg laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

In addition, impacts to occupied burrowing owl burrows shall be avoided in accordance with the following table unless a qualified biologist approved by CDFW verifies through non-invasive methods that either: 1) the birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1-Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16-Mar 31	50 m	100 m	500 m

MM BIO-8: Prior to ground disturbance activities, or within one week of being deployed at the project site for newly hired workers, all construction workers at the project site shall attend a Construction Worker Environmental Awareness Training and Education Program, developed and presented by a qualified biologist.

The Construction Worker Environmental Awareness Training and Education Program shall be presented by the biologist and shall include information on the life history wildlife and plant species that may be encountered during construction activities, their legal protections, the definition of "take" under the Endangered Species Act, measures the project operator is implementing to protect the species, reporting requirements, specific measures that each worker must employ to avoid take of the species, and penalties for violation of the Act. Identification and information regarding special-status or other sensitive species with the potential to occur on the project site shall also be provided to construction personnel. The program shall include:

- An acknowledgement form signed by each worker indicating that environmental training has been completed.
- A copy of the training transcript and/or training video/CD, as well as a list of the names of all personnel who attended the training and copies of the signed acknowledgement forms shall be maintain on site for the duration of construction activities.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated.***

Impact #3.4.4b – Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

There is one CNDDB occurrence of Valley Sink Scrub, approximately 3.2 miles south of the project (EONDX 16344). This sensitive natural community or any other sensitive natural community was not observed during the survey. The project is not located within a river or an area that encompasses a river or potential floodplain and does not contain nor is near any riparian habitat. The proposed project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community. Therefore, the project's impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.4c – Would the project have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The United States Army Corps of Engineers (USACE) has regulatory authority over the Clean Water Act (CWA), as provided for by the EPA. The USACE has established specific criteria for the determination of wetlands based upon the presence of wetland hydrology, hydric soils, and hydrophilic vegetation. There are no federally protected wetlands or vernal pools that occur within the project.

Wetlands, streams, reservoirs, sloughs, and ponds typically meet the criteria for federal jurisdiction under Section 404 of the CWA and state jurisdiction under the Porter-Cologne Water Quality Control Act. Streams and ponds typically meet the criteria for State jurisdiction under Section 1602 of the California Fish and Game Code. There is a freshwater pond 0.3 miles southwest of the project area, but it will not be impacted by project activities.

Although there is a historic water feature identified as a "riverine" by the National Wetland Inventory (see Figure 3.4.4-1), that feature no longer exists on the project site. The development of the campus has eliminated it. As noted during the biological survey, there are no features on or near the project that would meet the criteria for either federal or State jurisdiction. Accordingly, there are no wetlands or Waters of the U.S. occurring on the project site. There would be no impact to federally protected wetlands or waterways as a result of the proposed project. Therefore, the project would have no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.4d – Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Wildlife migratory corridors are described as a narrow stretch of land that connects two open pieces of habitat that would otherwise be unconnected. These routes provide shelter and sufficient food supplies to support wildlife species during migration. Movement corridors generally consist of riparian, woodlands, or forested habitats that span contiguous acres of undisturbed habitat and are important elements of resident species' home ranges.

The project falls within the Pacific Flyway, a significant migratory route encompassing the west coast of North America, but the project represents a very small land acreage within this territory and does not support any significant migratory stopover habitat. The proposed project and surrounding area does not occur within a known terrestrial migration route, significant wildlife corridor, or linkage area as identified by the Essential Habitat Connectivity Project (Spencer, W.D., et al, 2010). The survey conducted for the project did not provide evidence of a wildlife nursery or important migratory habitat being present on the project site. Migratory birds and raptors could use habitat on and near the project for foraging and/or as stopover sites during migrations or movement between local areas.

The project will not restrict, eliminate, or significantly alter a wildlife movement corridor, wildlife core area, or Essential Habitat Connectivity area, either during construction or after the project has been constructed. Project construction will not substantially interfere with wildlife movements or reduce breeding opportunities.

The proposed project would not interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. Therefore, the project's impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.4e – Would the Project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

There are no adopted local policies or ordinances protecting biological that would apply to this project site. Therefore, implementation of the proposed project would have no conflict related to an adopted local policies or ordinances protecting biological.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.4f – Would the project conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or State habitat conservation plan?

The project is not located within any Natural Community Conservation Plan or any other local, regional, or State Conservation Plan. With mitigation, the proposed project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State Habitat Conservation Plan.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

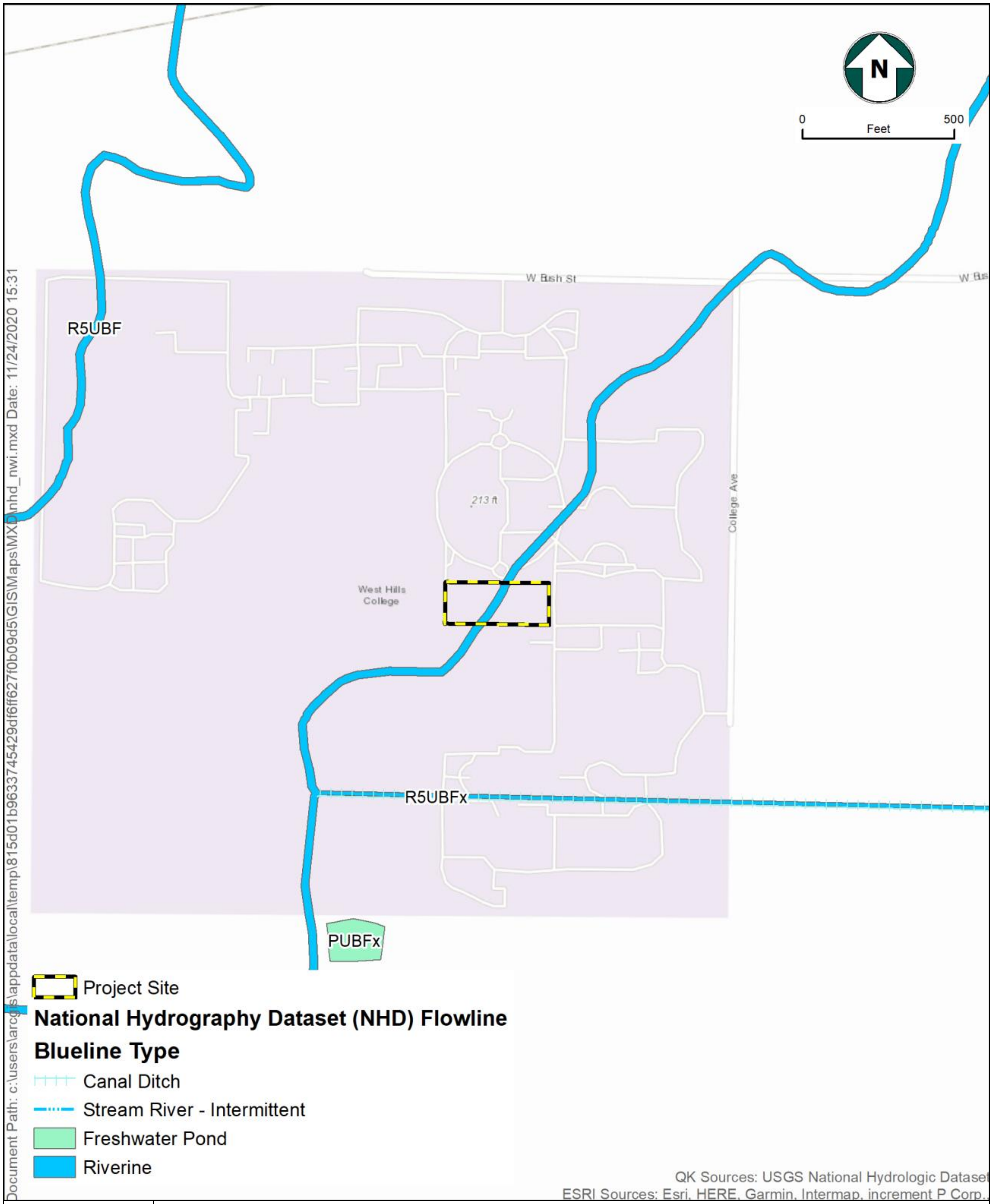

Figure 3.4.4-1
National Wetland Inventory and Hydrologic Information

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.5 - CULTURAL RESOURCES				
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5?	☐	☒	☐	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?	☐	☒	☐	☐
c. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

The analysis below is based on a Cultural Resources Technical Memorandum prepared for the project (QK, 2020) and found in Appendix B of this document.

Impact #3.4.5a – Would the project cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5?

The City of Lemoore 2030 General Plan states there are currently no buildings or structures listed in the National Register of Historic Places or as California Historic Landmarks. However, there are 37 sites listed as having local historic significance located within the downtown district (City of Lemoore , 2008).

A records search was conducted at the Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield to identify previously recorded resources and prior surveys within the project area and surrounding half-mile area. The records search covered an area within one-half mile of the project and included a review of the *National Register of Historic Places, California Points of Historical Interest, California Registry of Historic Resources, California Historical Landmarks, California State Historic Resources Inventory*, and a review of cultural resource reports on file.

The records search indicated that the subject property had never been surveyed for cultural resources and it is not known if any exist there. Only one cultural resource, a segment of the historic route of the Southern Pacific Railroad (now the San Joaquin Valley Railroad) (P-16-000122), has been identified within a half mile of the proposed project. However, the project will not impact this resource.

Based on the results of cultural records search findings and the lack of archaeological resources previously identified within a half-mile radius of the proposed project, the potential to encounter subsurface cultural resources is minimal. Additionally, the project construction would be conducted within the developed and previously disturbed roadways and road easements. The potential to uncover subsurface historical or archaeological deposits is would be considered unlikely.

However, there is still a possibility that historical or archaeological materials may be exposed during construction. Grading and trenching, as well as other ground-disturbing actions have the potential to damage or destroy these previously unidentified and potentially significant cultural resources within the project area, including historical or archaeological resources. Disturbance of any deposits that have the potential to provide significant cultural data would be considered a significant impact. To reduce the potential impacts of the project on cultural resources, the following measures are recommended. With implementation of CUL-1, impacts under cultural resources would be less than significant.

MITIGATION MEASURE(S)

MM CUL-1: If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. Implementation of the mitigation measure below would ensure that the proposed project would not cause a substantial adverse change in the significance of a historical resource.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

Impact #3.4.5b – Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?

See discussion of Impact #3.4.5a, above.

MITIGATION MEASURE(S)

Implement MM CUL-1.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

Impact #3.4.5c – Would the project disturb any human remains, including those interred outside of formal cemeteries?

Human remains are not known to exist within the project area. However, construction would involve earth-disturbing activities, and it is still possible that human remains may be discovered, possibly in association with archaeological sites. MM CUL-2 has been included in the unlikely event that human remains are found during ground-disturbing activities. Impacts would be less than significant with implementation of mitigation.

MITIGATION MEASURE(S)

MM CUL-2: If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code. The specific protocol, guidelines, and channels of communication outlined by the Native American Heritage Commission, in accordance with Section 7050.5 of the Health and Safety Code, Section 5097.98 of the Public Resources Code (Chapter 1492, Statutes of 1982, Senate Bill 297), and Senate Bill 447 (Chapter 44, Statutes of 1987), shall be followed. Section 7050.5(c) shall guide the potential Native American involvement, in the event of discovery of human remains, at the direction of the county coroner.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.6 - ENERGY				
Would the project:				
a. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b. Conflict with or obstruct a State or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Discussion

Impact #3.4.6a – Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Construction

Energy demand during the construction phase would result from the transportation of materials, construction equipment, and construction worker vehicle trips. Construction equipment includes a crane, bulldozer, grader, bob cat, trencher, cement trucks, water trucks, trash trucks, equipment delivery trucks, and company work vehicles. The project would comply with the SJVAPCD requirements regarding the limitation of vehicle idling, and the use of fuel-efficient vehicles and equipment, to the extent feasible. Energy saving strategies will be implemented where possible to further reduce the project's energy consumption, during the construction phase. Strategies being implemented include those recommended by the California Air Resources Board (CARB) that may reduce both the project's energy consumption, including diesel anti-idling measures, light-duty vehicle technology, usage of alternative fuels such as biodiesel blends and ethanol, and heavy-duty vehicle design measures to reduce energy consumption.

The project will not use natural gas during the construction phase. Compliance with standard regional and local regulations, the project would minimize fuel consumption during construction. By complying with standard regional and local regulations, the project would minimize fuel consumption during construction. Construction related fuel consumption is not expected to result in inefficient, wasteful, or unnecessary energy use. Thus, construction-related fuel consumption at the project would not result in inefficient, wasteful, or unnecessary energy use.

Post-Construction

With the project, it is expected that the annual electricity usage for the campus would increase by approximately six percent. The project will comply with all applicable standards and building codes included in the 2019 California Green Building Standards Code. Therefore, the project would have a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant.***

Impact #3.4.6b – Would the project conflict with or obstruct a State or local plan for renewable energy or energy efficiency?

See Impact #3.4.6a, above.

The project must comply with Title 24, Chapter 4 of the California Green Building Standards Code for residential development and Part 6, of the California Energy Code (CEC) the California Code of Regulations (CCR), Title 20 with adoptions of the California Energy Commission (California Building Standards Commission, 2019). It is the District's intention to exceed Title 24 requirements for energy efficiency, using the most effective equipment available to minimize energy consumption.

Energy saving strategies will be implemented where feasible to reduce the project's energy consumption during the construction and post-construction phases. Strategies being implemented include those recommended by the California Air Resources Board (CARB) that may reduce both the project's construction energy consumption, including diesel anti-idling measures, light-duty vehicle technology, usage of alternative fuels such as biodiesel blends and ethanol, and heavy-duty vehicle design measures to reduce energy consumption. The continued use of solar-generated energy along with the energy efficiency components outlined above will assist California in meeting greenhouse gas (GHG) emissions reduction goal by 2020 and 2030 as required by the California Global Warming Solutions Act (AB 32), as amended by SB 32 in 2016.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant.***

3.4.7 - Geology and Soils

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☒	☐	☐
iii. Seismic-related ground failure, including Liquefaction?	☐	☒	☐	☐
iv. Landslides?	☐	☐	☒	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☒	☐	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☒	☐	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	☐	☐	☒	☐
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

Discussion

The analysis below is based on the Geotechnical Engineering Investigation completed for the student center on the campus adjacent to the project site by BSK Associates (BSK Associates, 2011), found in Appendix C in this document.

Impact #3.4.7a(i) – Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

According to the City of Lemoore 2030 General Plan, there are no known major fault systems within Lemoore (City of Lemoore, 2008). The project site is not located within an Alquist-Priolo Earthquake Fault Zone and the closest Fault-Rupture Hazard Zone is associated with the Nunez Fault located approximately 35 miles west of the campus (BSK Associates, 2011). By adhering to the most recent California Building Standard Codes and other applicable local codes, the project will have a less-than-significant impact related to earthquakes and seismic events.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.7a(ii) – Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

See response to Impact #3.4.7a.

Secondary hazards from earthquakes include ground shaking/rupture, seiche, landslides, liquefaction, and subsidence. Since there are no known faults within the immediate area, ground shaking/rupture from surface faulting should not be a potential problem. Seiche and landslides are not potential hazards in the area. Lastly, deep subsidence problems may be low to moderate according to the conclusions of the Five County Seismic Safety Element. However, the site is not located in an area susceptible to subsidence due to petroleum or groundwater withdrawal (BSK Associates, 2011).

According to the Seismic Safety Map contained within the Health and Safety Element of the 2035 Kings County General Plan (Figure HS-2, page HS-10), the project site is located within an area designated as Zone V1 or Valley Zone 1, which is identified as the area of least expected seismic shaking by the Kings County Seismic Zone Description in the 2035 General Plan (County of Kings, 2010). The potential for ground shaking is discussed in terms of the percent probability of exceeding peak ground acceleration (% g) in the next 50 years (County of Kings, 2010).

The project is required to design the new facilities and associated infrastructure to withstand substantial ground shaking in accordance with all applicable State law and applicable codes included in the CBC Title 24 for earthquake construction standards and building standards code including those relating to soil characteristics (California Building Standards Commission, 2019). Based on previous projects, a final Geotechnical Report prepared by a licensed engineer to determine the preparation of the project site prior to construction and design the building to withstand seismic events The project will adhere to all applicable local and State regulations to reduce any potentially significant impacts to structures resulting from strong seismic ground shaking at the project site. With implementation of MM GEO-1 and all applicable local and State codes, project impacts would be less than significant with mitigation.

MITIGATION MEASURE(S)

MM GEO-1: Prior to the ground disturbance activities, a qualified engineer shall be obtained. The project engineer, structural engineer, civil engineer, general contractor, the earthwork contractor shall meet to discuss the grading plan and grading requirements as outlined in the final Geotechnical Report.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation.***

Impact #3.4.7a(iii) - Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

See discussion of Impact #3.4.7a(i) and a(ii), above.

The potential magnitude/geographic extent of expansive liquefaction erosion was deemed ‘negligible’ and its significance ‘low’ throughout the City (City of Lemoore, 2012). Liquefaction is possible in local areas during a strong earthquake or other seismic ground shaking, where unconsolidated sediments coincide with a high-water table.

Structures constructed as part of the project would be required by State law to be constructed in accordance with all applicable IBC and CBC earthquake construction standards, including those relating to soil characteristics. Adherence to all applicable regulations would avoid any potential impacts to structures resulting from liquefaction at the project site.

Test boring indicated that free groundwater was encountered at depths of approximately seven feet bgs during subsurface investigation. The analysis conducted to determine safety against liquefaction determined the site to have a value of less than 1.0, which is acceptable for most structures and it was determined the overall potential for liquefaction to occur at the site is low (BSK Associates, 2011).

Structures constructed as part of the project would be required by State law to be constructed in accordance with all applicable IBC CBC, Title 24 construction standards. Adherence to all applicable regulations and implementation of MM GEO-1 would reduce potential impacts to structures resulting from seismically related ground failure to less-than-significant levels.

MITIGATION MEASURE(S)

Implementation of MM GEO-1.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation.***

Impact #3.4.6a(iv) – Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

The site and surrounding areas are essentially flat. As such, there is no potential for rock fall and landslides to impact the project in the event of a major earthquake, as the area has no dramatic elevation changes (BSK Associates, 2011). Secondary hazards from earthquakes include ground shaking/rupture, seiche, landslides, liquefaction, and subsidence. Since there are no known faults within the immediate area, ground shaking/rupture from surface faulting should not be a potential problem. Additionally, there is not a potential for seiche and landslides. Lastly, deep subsidence problems may be low to moderate according to the conclusions of the Five County Seismic Safety Element. However, the project is not in an area susceptible to subsidence (BSK Associates, 2011).

The area surrounding the project site currently is developed. The site's topography would not change substantially as a result of project development since the site is essentially flat in nature from previous activities with no surrounding slopes and it is not considered to be prone to landslides. The project would not expose people or structures to potential substantial adverse effects from landslides. Therefore, there would be a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***

Impact #3.4.7b – Would the project result in substantial soil erosion or the loss of topsoil?

The type of soil found within the project site is Goldsberg loam. The construction of the project is not expected to subject the site to any extreme erosion problems.

Construction activities associated with the proposed project will disturb surface vegetation and soils during construction and would expose these disturbed areas to erosion by wind and water. To reduce the potential for soil erosion and loss of topsoil, the project would comply with the State Water Resources Control Board's (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit (No. 2012-0006-DWQ) during construction. Under the NPDES, the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) are required for construction activities that would disturb an area of one acre or more. A SWPPP must identify potential sources of erosion or sedimentation as well as identify and implement Best Management Practices (BMPs) that ensure reduce erosion. Typical BMPs intended to control erosion include sandbags, retention basins, silt fencing, street sweeping, etc.

Mitigation Measure MM GEO-2 requires the approval of a SWPPP to comply with the NPDES General Construction Permit. The project will comply with all the grading requirements as outlined in Title 24 and Appendix J of the California Building Code (UpCodes, 2016). The project is not expected to result in substantial soil erosion or the loss of topsoil with the incorporation of Mitigation Measure MM GEO-1.

Once constructed, the project will have both impermeable surfaces as well as permeable surfaces. Impermeable surfaces would include roadways, driveways and building sites. Permeable surfaces would include any landscaped areas and open space. Overall, development of the project would not result in conditions where substantial surface soils would be exposed to wind and water erosion.

MITIGATION MEASURE(S)

MM GEO-2: Prior to issuing of grading or building permits, the project applicant shall submit to the City: (1) the approved Storm Water Pollution Prevention Plan (SWPPP) and (2) the Notice of Intent (NOI) to comply with the General National Pollutant Discharge Elimination System (NPDES) from the Central Valley Regional Water Quality Control Board. The requirements of the SWPPP and NPDES shall be incorporated into design specifications and construction contracts. Recommended Best Management Practices for the construction phase may include the following:

- Stockpiling and disposing of demolition debris, concrete, and soil properly;
- Protecting existing storm drain inlets and stabilizing disturbed areas;
- Implementing erosion controls;
- Properly managing construction materials; and
- Managing waste, aggressively controlling litter, and implementing sediment controls.

Evidence of the approved SWPPP shall be submitted to the Lead Agency.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

Impact #3.4.7c – Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

As previously discussed, the site soils are considered stable in that there is not a potential of on or offsite landslides, lateral spreading, subsidence or collapse. As discussed in Impact #3.4.7a(iii), the project site soils have a low overall potential for significant liquefaction to occur at the site. All structures would be subject to all IBC and CBC earthquake construction standards, including those relating to soil characteristics. In order to reduce impacts related to unstable soils, MM GEO-1 requires a registered engineering geologist or soils engineer to provide recommendations to provide sufficient specification for project structures. With implementation of MM GEO-1, impacts would be less than significant.

MITIGATION MEASURE(S)

Implementation of MM GEO-1.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated.***

Impact #3.4.7d – Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

See Impact 3.4.7b and c.

Expansive clay soils are subject to shrinking and swelling due to changes in moisture content over the seasons. These changes can cause damage or failure of foundations, utilities, and pavements. During periods of high moisture content, expansive soils under foundations can heave and result in structures lifting. In dry periods, the same soils can collapse and result in settlement of structures.

The subject site and soil conditions consists of silty sands, silty clays, clayey silts, and sandy silts. Based on the results of the consolidation tests, the on-site soils below two feet are considered to have a low potential for hydrocompaction. The upper five feet of the on-site soils are considered to have medium expansion potential (BSK Associates, 2011). Any recommendations based on the results of the evaluation would be performed according to standard geotechnical engineering practices and meet all local and State codes and regulations. With implementation of MM GEO-1 impacts related to expansive soils would be less than significant.

MITIGATION MEASURE(S)

Implementation of GEO-1.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated.***

Impact #3.4.7e – Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?

Refer to *Section 3.4.19 - Utilities and Service Systems*.

The proposed project does not include the development or use of septic tanks or alternative wastewater disposal systems as the project would connect to the City's existing sewer system.

MITIGATION MEASURES

None are required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant.***

Impact #3.4.7f – Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The project does not intend to use undisturbed land; all construction will be conducted within the footprint of the existing campus. According to the Kings County General Plan EIR, there is only one site in the County considered to be sensitive for paleontological resources (Kings County, 2010b). There are no unique geological features or known fossil-bearing sediments in the vicinity of the project site. However, there remains the possibility for previously unknown, buried paleontological resources or unique geological sites to be uncovered during subsurface construction activities. Therefore, this would be a potentially significant impact. However, MM GEO-3, requires that if unknown paleontological resources are discovered during construction activities, work within a 25-foot buffer would cease until a qualified paleontologist determined the appropriate course of action. With implementation of MM GEO-3, the project will have a less-than-significant impact.

MITIGATION MEASURE(S)

MM GEO-3: If any paleontological resources are encountered during ground disturbance activities, all work within 25 feet of the find shall halt until a qualified paleontologist as defined by the Society of Vertebrate Paleontology Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (2010), can evaluate the find and make recommendations regarding treatment. Paleontological resource materials may include resources such as fossils, plant impressions, or animal tracks preserved in rock. The qualified paleontologist shall contact the Natural History Museum of Los Angeles County or other appropriate facility regarding any discoveries of paleontological resources.

If the qualified paleontologist determines that the discovery represents a potentially significant paleontological resource, additional investigations and fossil recovery may be required to mitigate adverse impacts from project implementation. If avoidance is not feasible, the paleontological resources shall be evaluated for their significance. If the resources are not significant, avoidance is not necessary. If the resources are significant, they shall be avoided to ensure no adverse effects, or such effects must be mitigated. Construction in that area shall not resume until the resource appropriate measures are recommended or the materials are determined to be less than significant. If the resource is significant and fossil recovery is the identified form of treatment, then the fossil shall be deposited in an accredited and permanent scientific institution. Copies of all correspondence and reports shall be submitted to the Lead Agency.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant. with mitigation incorporated***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.8 - GREENHOUSE GAS EMISSIONS				
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b. Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Discussion

The analysis in this section is based on the Small Project Analysis Level Assessment prepared for the project (Trinity Consultants, 2020), which can be found in Appendix A of this document.

There have been significant legislative and regulatory activities that directly and indirectly affect climate change and GHGs in California. The primary climate change legislation in California is AB 32, the California Global Warming Solutions Act of 2006. AB 32 focuses on reducing GHG emissions in California. GHGs, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and Nitrogen trifluoride. AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. The California Air Resources Board is the State agency charged with monitoring and regulating sources of emissions of GHGs that cause global warming in order to reduce emissions of GHGs. SB 32 was signed by the Governor in 2016, which would require the State Board to ensure that statewide greenhouse gas emissions are reduced to 40 percent below the 1990 level by 2030.

Although construction of the proposed project would result in temporary emissions of GHGs, the project as a whole is not expected to generate greenhouse gas emissions, either directly or indirectly that may have a significant impact on the environment. The project GHG emissions are primarily from mobile source activities.

The SJVAPCD Small Project Analysis Level (SPAL) process established review parameters to determine whether a project qualifies as a “small project.” A project that is found to be “less than” the established parameters, according to the SPAL review parameters, has “no possibility of exceeding criteria pollutant emissions thresholds.”

As shown in Table 3.4.3-3, the proposed project would not exceed the established SPAL limits for an educational project. The project would construct a new 42,429-square-foot, two-story Instructional Center, which is less than the SPAL threshold for a Junior College (2 year) of 74,400 square feet. Based on the above information, this project qualifies for a limited GHG analysis applying the SPAL guidance to determine air quality impacts.

Impact #3.4.8a – Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

See Impact #3.4.6a, above.

Construction and operation of this project will result in temporary Greenhouse Gases (GHG) emissions. The project as a whole is not expected to generate GHGs either directly or indirectly that may have a significant impact on the environment. The project's greenhouse gas (GHG) emissions are primarily from mobile source activities and are shown in Table 3.4.8-1.

Table 3.4.8-1
Estimated Annual Greenhouse Gas Emissions

	CO_2 Emissions metric tons	CH4 Emissions metric tons	N_2O Emissions metric tons	CO_2e Emissions metric tons
2024 Project Operations	1,298.58	0.82	0.004	1,320.16
2005 BAU	1,928.57	1.44	0.004	1,965.82
BAU less Project Emissions				32.8%

Source: (Trinity Consultants, 2020)

The SJVAPCD does not have thresholds or guidance regarding the significance of construction related emissions. Overall, the impacts to occur during the construction phase would be short-term and temporary in nature. As there are no current significance thresholds to quantify construction emissions and because construction-related impacts are considered temporary they are therefore, generally considered less than significant. In addition, construction of the proposed project would still have to comply with the SJVAPCD's regulation and requirements as discussed in the air quality section.

The project will not generate long-term emissions over the life of the project. Therefore, the project is considered less than significant for GHG emission impacts.

MITIGATION MEASURES

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***

Impact #3.4.8b – Would the project conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

See response to Impact #3.4.8a.

The amount of CO_2 that would be generated by the project is so small in relation to the California CO_2 equivalent estimates for 2020 (596 million metric tons CO_2e) that it's not possible for the contribution of the project to be cumulatively considerable. Additionally, the project's GHG emissions are less than the 2005 business as usual emissions for the project by 645.66 metric tons CO_2e, which is a 32.8 percent reduction. Therefore, the project would not generate a cumulatively considerable GHG impact nor would it conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. The project will also not conflict with any elements of the California Air Resources Board's 2008 Climate Change Scoping Plan. Therefore, this potential impact is less than significant.

MITIGATION MEASURES

No mitigation required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.9 - *HAZARDS AND HAZARDOUS MATERIALS*				
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c. Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f. Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires??	☐	☐	☐	☒

Discussion

Impact #3.4.9a – Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

The building and operation of the proposed project would not involve the transport, use, and storage of large quantities of hazardous materials. Although construction of the site would involve the transport and use of minor quantities of hazardous materials, such materials would be limited to fuels, oils, lubricants, hydraulic fluids, paints and solvents utilized at the project site for construction purposes. Moreover, use of such materials would be temporary in nature and would cease upon completion of the project. Some solid hazardous waste, such as welding materials and dried paint, may also be generated during construction. These materials would be transported to the project site during construction, and any hazardous materials that are produced as a result of the construction of the project would be collected and transported away from the site. During construction of the project, material safety data sheets for all applicable materials present at the site would be made readily available to onsite personnel. During construction activities, non-hazardous construction debris would be generated and disposed of in local landfills. Sanitary waste would be managed using portable toilets located at a reasonably accessible onsite location.

The project site is located within an existing school campus. The use of hazardous materials will be limited in quantities and duration, and if spilled, would be very localized. The proposed project would not emit hazardous emissions or involve handling hazardous or acutely hazardous materials substances. The transport use and storage of hazardous materials would be required to comply with all applicable State and federal regulations, such as requirements that spills would be cleaned immediately, and all wastes and spills control materials would be properly disposed of at approved disposal facilities.

Mitigation Measure MM GEO-2 requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP), which includes a list of BMPs to be implemented on the site both during construction to minimize potential impacts from accidental spills. Compliance with the SWPPP and all local, State, and federal regulations regarding hazardous materials, impacts associated with the use or accidental spill of hazardous materials would be less than significant.

MITIGATION MEASURE(S)

Implementation of MM GEO-2.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

Impact #3.4.9b – Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

See Impact #3.4.8a, above.

There are no active Geologic Energy Management Division (CalGEM) identified oil or gas fields in the project vicinity and there are no known existing or historical oil wells on the project site (CalGEM, 2020). As such, it is not expected that any wells would be impacted by the project.

The completed project will not create significant hazards to the public or the environment through a reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Therefore, the project will have a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant.***

Impact #3.4.9c – Would the project emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The closest school is Lemoore Elementary Charter School, which is on the campus and approximately 930 feet west of the project. However, construction of the project would require the use of minimal hazardous materials and require implementation of BMPs when handling any hazardous materials, substances, or waste. Operation of the project would not emit any involve handling of any hazardous materials near the elementary school campus site. Therefore, impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant.***

Impact #3.4.9d – Would the project be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

An online search was conducted of Cortese List to identify locations on or near the project site. The search indicated that there are no hazardous or toxic sites in the vicinity (within one mile) of the project site (Cal EPA, 2020). Currently, there are no hazardous wastes landfill sites within Lemoore. The Kings Waste & Recycling Authority maintains a permanent household hazardous waste facility in the City of Hanford. Lemoore residents can make use of this facility through free household hazardous waste disposal services available at collection sites in the City. The City collects e-waste, battery, and used oil for disposal (City of Lemoore, 2008).

According to EnviroStor, there are no hazardous waste and substances sites in the vicinity of the project site. The proposed project site is not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would therefore not create a significant hazard to the public or the environment.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.9e – For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

There are no public airports within two miles of the project site. The Lemoore NAS runways are located approximately five miles to the south west of the project site. The closest public airport is the Hanford Municipal Airport, located approximately 13 miles east of the project. The project is not within an airport land use compatibility plan area. Therefore, the Project would not result in a safety hazard as a result of proximity to a public or private use airport and would have no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.9f –Would the project impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?

The Kings County Emergency Operations Plan (EOP) establishes emergency procedures and policies and identifies responsible parties for emergency response in the County, and includes the incorporated City of Lemoore (Kings County, 2015). The EOP includes policies that would prevent new development from interfering with emergency response of evacuation plans. The proposed project would not impair implementation of or physically interfere with the West Hills Community College Emergency Response Plan.

The project would also comply with the appropriate local and State requirements regarding emergency response plans and access. The proposed project would not inhibit the ability of local roadways to continue to accommodate emergency response and evacuation activities. The proposed project would not interfere with the City or the District's adopted emergency response plan; therefore, there would be no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.9g – Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

The proposed project site is in an unzoned area of the Kings County Fire Hazard Severity Zone Map Local Responsibility Area (LRA) (Cal Fire, 2006). The project site is not within a wildland area nor is there within the vicinity of the project site. Construction activities and the project is not expected to increase the risk of wildfires on and adjacent to the project site.

The Lemoore City Volunteer Fire Department, located approximately 2.5 miles away, would provide fire protection services to the project.

The project will comply with all applicable State and local building standards as required by local fire codes. The project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. Therefore, there would be no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.10 - HYDROLOGY AND WATER QUALITY				
Would the project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality?	☐	☒	☐	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. Result in substantial erosion or siltation on or offsite?	☐	☒	☐	☐
. ii. Substantially increase the rate of amount of surface runoff in a manner which would result flooding on or offsite?	☐	☒	☐	☐
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☒	☐	☐
iv. Impede or redirect flood flows?	☐	☒	☐	☐
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

Discussion

Impact #3.4.10a – Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Project construction would cause ground disturbance that could result in soil erosion or siltation and subsequent water quality degradation offsite, which is a potentially significant impact. Construction-related activities would also involve the use of materials such as vehicle fuels, lubricating fluids, solvents, and other materials that could result in polluted runoff, which is also a potentially significant impact. Construction activities involving soil disturbance, excavation, cutting/filling, stockpiling and grading activities could result in increased erosion and sedimentation to surface waters. However, the potential consequences of any spill or release of these types of materials are generally minimal due to the localized, short-term nature of such releases. The volume of any spills would likely be relatively small because the volume in any single vehicle or container would generally be anticipated to be less than 50 gallons.

As noted in Impact #3.4.9b, accidental spills or disposal of potentially harmful materials used during construction could possibly wash into and pollute surface water runoff. Mitigation Measure MM GEO-2 requires the preparation and implementation of a SWPPP to comply with the Construction General Permit requirements.

In order to reduce potential impacts to water quality during construction activities, Mitigation Measures MM GEO-1 as well as MM HYD-1 would be required. MM HYD-1 limits the amount of ground disturbance during grading activities to a minimum and implement BMPs to reduce the potential for soil erosion or water runoff during a rain event. With mitigation, the proposed project would not violate any water quality standards or waste discharge requirements. Once constructed, the project would drain water into the existing City sewer system and would not degrade surface or groundwater quality.

MITIGATION MEASURE(S)

MM HYD-1: The District shall limit grading to the minimum area necessary for construction of the project. Final grading plans shall include best management practices to limit on-site and off-site erosion.

Implementation of Mitigation Measure MM GEO-1.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

Impact #3.4.10b – Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The water purveyor for the project is the City of Lemoore. The City has adopted an Urban Water Management Plan (UWMP) in 2017 (City of Lemoore, 2017). This document is a planning tool that was created to help generally guide the actions of urban water suppliers in successfully preparing for potential water supply disruptions and issues. It provides a framework for long-term water planning and informs the public of a supplier's plans for long-term resource planning that ensures adequate water supplies for existing and future demands.

The City currently utilizes local groundwater as its sole source of municipal water supply. The City's municipal water system extracts its water supply from underground aquifers via six active groundwater wells within the city limits. The City maintains four ground-level storage reservoirs within the distribution system, with a total capacity of 4.4 million gallons (MG) (City of Lemoore, 2017). The groundwater basin underlying the City is the Tulare Lake Basin as defined in the Department of Water Resources Bulletin 118 for construction and operation would come from the City of Lemoore's existing water system.

Per the City's 2015 UWMP, the City's existing system has a total supply capacity of 21,674,000 gallons per day with an average day demand of 8,769,000 gallons (City of Lemoore, 2017). As the project site is currently designated for community facilities, the General Plan has adequately analyzed the water needed to meet the water demand.

The existing college campus uses approximately 3,000 HCF (Hundred Cubic Feet) or 0.068 acre feet of water monthly (City of Lemoore, 2020). The proposed project will minimally increase the student population by five percent or 232 students. Since students commute and do not live on campus, this increase would not substantially increase water demand. Nor would implementation of the project deplete aquifer supplies or interfere substantially with groundwater recharge or significantly alter local groundwater supplies. Therefore, the project will have a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant.***

Impact #3.4.10c(i) – Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?

The rate and amount of surface runoff is determined by multiple factors, including the following: topography, the amount and intensity of precipitation, the amount of evaporation that occurs in the watershed and the amount of precipitation and water that infiltrates to the groundwater. The proposed project would alter the existing drainage pattern of the site, which would have the potential to result in erosion, siltation, or flooding on or offsite.

However, there are no streams or rivers located on the project site. The disturbance of soils onsite during construction could cause erosion, resulting in temporary construction impacts. In addition, the placement of permanent structures onsite could affect drainage in the long-term. Impacts from construction and operation are discussed below.

As discussed in Impact #3.4.10a. above, potential impacts on water quality arising from erosion and sedimentation are expected to be localized and temporary during construction. Construction-related erosion and sedimentation impacts as a result of soil disturbance would be less than significant after implementation of an SWPPP (see Mitigation Measure MM GEO-2) and BMPs required by the NPDES. No drainages or other water bodies are present on the project site, and therefore, the proposed project would not change the course of any such drainages.

Existing drainage pattern of the site and area would be affected by project development because of the increase in impervious surfaces at the site. The project design includes natural features such as landscaping and vegetation that would allow for the percolation of stormwater. However, there will be an addition in impervious surfaces that could increase the potential for stormwater runoff and soil erosion. The project would connect to existing City stormwater sewer infrastructure. The project will comply with all applicable local building codes and regulations in order to minimize impacts during construction and post-construction of the project. With implementation of MM GEO-2, impacts that would result in substantial erosion or siltation on or offsite is less than significant.

MITIGATION MEASURE(S)

Implementation of MM GEO-2.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

Impact #3.4.10c(ii) – Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?

See also Impact #3.4.10c(i), above. The project site is flat, and grading would be minimal. The topography of the site would not change because of grading activities, and it does not contain any water features, streams or rivers. The project would not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion or siltation on- or off-site with the implementation of recommended Mitigation Measures MM GEO-2, which require an approved SWPPP and the use of BMP, and MM HYD-1, which minimizes the amount of disturbed dirt where feasible during construction. Once operational, there would be no impact. Therefore, the project would have a less-than-significant impact with the incorporation of mitigation.

Mitigation Measure(s)

Implement MM GEO-2 and MM HYD-1.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated.***

Impact #3.4.10c(iii) – Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Please see Impact #3.4.10c(i)-c(ii), above, there are no water features, including a river or stream, on or near the project. Existing drainage pattern of the site and area would be affected by project development during grading as well as the construction of impervious surfaces such as the proposed buildings. Therefore, the project would have a less-than-significant impact.

With implementation recommended Mitigation Measures MM GEO-1, which require an approved SWPPP and the use of BMP, MM HYD-1, which minimizes the amount of disturbed dirt where feasible during construction, the project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site, contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, nor provide additional sources of polluted runoff during construction or operations. Therefore, with mitigation, the project would have a less-than-significant impact.

MITIGATION MEASURE(S)

Implementation of Mitigation Measures MM GEO-1and MM HYD-1.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated.***

Impact #3.4.10c(iv) – Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows?

As discussed above in Impact #3.4.10a through c(iii), construction activities could potentially degrade water quality through the occurrence of erosion or siltation at the project site.

Construction of the project would include soil-disturbing activities that could result in erosion and siltation, as well as the use of harmful and potentially hazardous materials required to operate vehicles and equipment. The transport of disturbed soils or the accidental release of potentially hazardous materials could result in water quality degradation. The project would be required comply with the NPDES Construction General Permit. A SWPPP would be prepared to specify BMPs to prevent construction pollutants as required by MM GEO-2. The proposed project would not otherwise substantially degrade water quality.

As discussed above, the existing drainage pattern of the site and area would be affected by project development. However, the project will connect to the existing stormwater sewer system, and therefore potential impacts resulting from the impeding or redirection of flood flows would be less than significant. Therefore, the project will have a less-than-significant impact with mitigation incorporated.

MITIGATION MEASURE(S)

Implementation MM GEO-2.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated**.*

Impact #3.4.10d – Would the project, in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

The project site is not located near the ocean or a steep topographic feature (i.e., mountain, hill, bluff, etc.). Additionally, there is no body of water within the vicinity of the project site. The proposed project's inland location makes the risk of tsunami highly unlikely. The probability of a seiche occurring in the City of Lemoore is considered negligible. Furthermore, given the geologic context at the proposed project site and the absence of pollutants, if such an event were to occur, the likelihood of it exposing project structures or people to a significant risk is considered low.

As shown in Figure 3.4.10-1, the project is not located within a FEMA 100-year floodplain. According to FEMA, the site is located in an area of minimal flood hazard. As such, the project would not place housing within a 100-year flood hazard area as mapped on a federal flood hazard boundary or flood insurance rate map or other flood hazard delineation map.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant.***

Impact #3.4.10e – Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

As discussed in Impact #3.4.10b, the water demand from this project would not result in a significant impact due to depleted groundwater resources or interference with groundwater recharge. Per the City's 2015 UWMP, the City's existing system has a total supply capacity of 21,674,000 gallons per day with an average day demand of 8,769,000 gallons (City of Lemoore, 2017). The existing college uses 22,158 gallons of water monthly, which represents a minimal portion of the water available from the City.

As the project site has a land use designation for Community Facilities, the General Plan has adequately analyzed the water needed to meet the increased water demand. The proposed project will not substantially deplete aquifer supplies or interfere substantially with groundwater recharge or significantly alter local groundwater supplies. Therefore, the project will have a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

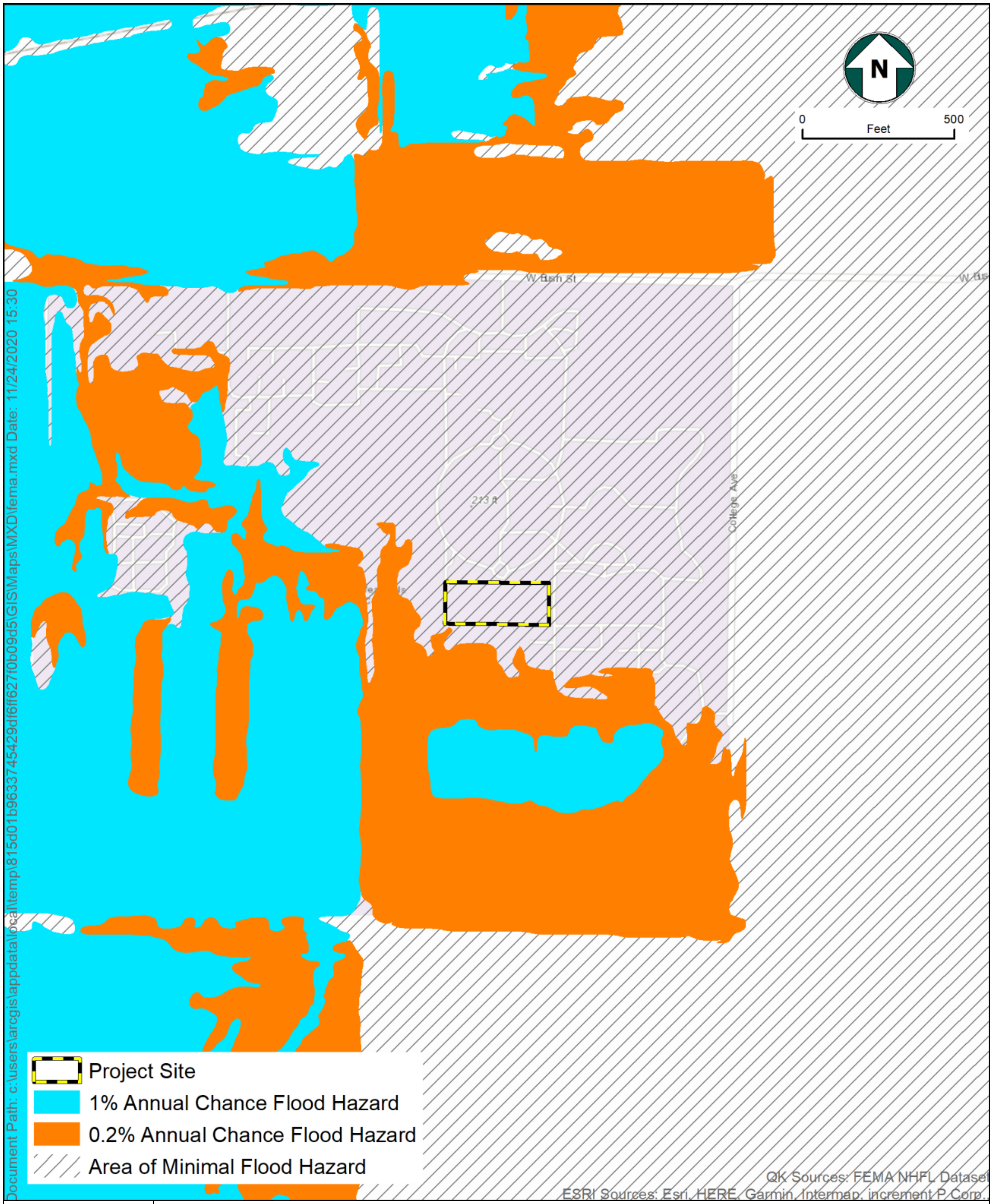

Figure 3.4.10-1
100-Year Floodplain

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact

3.4.11 - LAND USE AND PLANNING

Would the project:

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a.	Physically divide an established community?	☐	☐	☐	☒
b.	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Discussion

Impact #3.4.11a – Would the project physically divide an established community?

The project is within the existing West Hills College Lemoore campus. The proposed project will be implemented within the existing footprint of the campus and would not physically divide an established community. Therefore, the project would have no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.11b – Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

The project is within the Lemoore General Plan, which has land use designation of Community Facilities. However, Government Code Section 53091 does not require a school district to comply with County land use designations or zoning requirements. The project will build a new building within the existing campus footprint. The proposed project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect. Therefore, the project would have no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.12 - MINERAL RESOURCES				
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?	☐	☐	☐	☒
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Discussion

Impact #3.4.12a – Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?

The City of Lemoore and the surrounding area have no mapped mineral resources, and no regulated mine facilities (City of Lemoore, 2008). Additionally, per the California Department of Conservation - Geologic Energy Management Division (CalGEM, formerly the Division of Oil, Gas, and Geothermal Resources [DOGGR]), there are no active, inactive, or capped oil wells located within the project site, and it is not within a DOGGR-recognized oilfield. Therefore, there would be no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

Impact #3.4.12b – Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

The project site is not designated for mineral and petroleum resources activities by the City of Lemoore General Plan. The project site and surrounding lands are zoned for residential, mixed-use, and community facilities. No mining occurs in the project area or in the nearby vicinity. The closest active oil and gas field is located in the unincorporated community of Westhaven, approximately 10 miles southwest of the project site. There are no mineral extraction activities that will be conducted in the future as a result of the project. The project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan and would therefore have no impact.

MITIGATION MEASURES

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.13 - *NOISE*				
Would the project result in:				
a. Exposure of persons to, or generate, noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?	☐	☐	☒	☐
b. Exposure of persons to or generate excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. For a project located within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

Discussion

Impact #3.4.13a – Would the project result in exposure of persons to, or generate, noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?

The City of Lemoore 2030 General Plan Section 8.6-Noise provides a land use compatibility for community noise environment thresholds for schools of acceptable up to 70 dB (City of Lemoore, 2008). Construction and operation of the project will not exceed this standard.

Construction-related noise levels and activities will be temporary and intermittent. The proposed project will generate noise from the following construction equipment: crane, bulldozer, grader, bob cat, trencher, cement truck, water truck, trash truck, equipment delivery truck, and company vehicles. Additionally, traffic and the various other noises generally associated with construction activities will be temporary and only take place during daylight hours. In addition, the construction-related noise will be intermittent and cease once the proposed project is completed. Consequently, sensitive receptors located at the school site will not be exposed to noise levels that violate applicable noise standards. Impacts to sensitive receptors onsite are considered less than significant.

Once constructed, the project would not significantly increase traffic on local roadways and will not generate other types of noise. Activities that would take place within the new facilities would be similar to noise currently generated around the school site.

As indicated above, the project's noise impacts are anticipated to generate noise levels below standards established and comply with local codes and regulations. Any permanent increase in ambient noise levels in the project vicinity and temporary or periodic increases in ambient noise levels in the project vicinity would not be considered significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.13b – Would the project result in exposure of persons to or generate excessive groundborne vibration or groundborne noise levels?

Construction activities in general can have the potential to create groundborne vibrations. However, based on the soil types found in the general project vicinity, it is unlikely that any blasting or pile-driving would be required in connection with construction of the project.

The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations (Federal Highway Administration (FHWA), U.S. Department of Transportation, 2017). In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.2 inch/second) appears to be conservative even for sustained pile driving. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. The typical vibration produced by construction equipment is illustrated in Table 3.4.13-1.

As indicated in Table 3.4.13-1, below, based on the FTA data, vibration velocities from typical heavy construction equipment that would be used during project construction range from 0.003 to 0.210 inch-per-second peak particle velocity (PPV) at 25 feet from the source of activity.

Table 3.4.13-1
Vibration Generated by Construction Equipment

Equipment	Reference peak particle velocity at 25 feet (inches/second)[1]	Approximate peak particle velocity at 100 feet (inches/second)[2]
Large bulldozer	0.089	0.011
Loaded trucks	0.076	0.010
Small bulldozer	0.003	0.0004

Vibratory compactor/roller	0.210	0.026

Notes:
1 – Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006. Table 12-2.
2 – Calculated using the following formula:
PPV $_{equip}$ = PPVref x (25/D)1.5
where: PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance PPV (ref) = the reference vibration level in in/sec from Table 12-2 of the FTA Transit Noise and Vibration Impact Assessment Guidelines
D = the distance from the equipment to the receiver

Construction will be of short duration and not required jackhammers or pile driving. Therefore, the potential for groundborne vibrations impacts during the construction of the project is considered less than significant. Once operational, the project would not have any activities that would create groundborne vibrations. The proposed project would not result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.13c – For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

To minimize noise conflicts, the City has taken steps to ensure appropriate noise mitigation measures are in place before allowing development, including measures such as the noise level reduction (NLR) criteria in Air Installations Compatible Use Zones (AICUZ)instructions aircraft noise policies.

The City Zoning Ordinance established a Naval Air Station Lemoore (NASL) overlay zone as provided in this article will apply to those properties as designated on the zoning map, generally west of State Route 41 and south of the city limits, which fall in the military influence area (MIA) (Ord. 2013-05, 2-6-2014) (City of Lemoore, 2020). The project is within the Overlay III area, which experiences aircraft noise less than 65 decibels (<65 dB CNEL). Development located within Overlay III of the NASL overlay zone are required to be constructed so as to attain an indoor noise level of 45 decibels (45 dB CNEL). The project shall be constructed in accordance with noise attenuation standards of the City adopted building code AICUZ. Impacts would be less than significant.

MITIGATION MEASURES

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less- than Significant Impact	No Impact
3.4.14 - POPULATION AND HOUSING				
Would the project:				
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

Impact #3.4.14a – Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The project includes a new Instructional Center could slight population growth in the area because is anticipated to increase the student population by five percent. However, the potential for population growth is not substantial relative to the total population of the City of Lemoore. According the California Department of Finance estimate, the City's population was 26,257 in 2019. The City anticipates a 3.1 percent annual increase in population, with an estimated population of 34,719 in 2025 and 47,115 by 2035 (City of Lemoore, 2017). Therefore, the impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.14b – Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

The proposed project would not require demolition of any housing, as the project site is currently undeveloped. Therefore, there would be no need to construct replacement housing elsewhere. There would be no impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

There would be ***no impact***.

3.4.15 - PUBLIC SERVICES

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services:				
i. Fire protection?	☐	☐	☒	☐
ii. Police protection?	☐	☐	☒	☐
iii. Schools?	☐	☐	☒	☐
iv. Parks?	☐	☐	☒	☐
v. Other public facilities?	☐	☐	☒	☐

Discussion

Impact #3.4.15a(i) – Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services – fire protection?

The Lemoore Volunteer Fire Department (LVFD) has operated as an all-volunteer department since 1921. The LVFD includes one Chief, two Assistant Chiefs, four Crew Captains, seven Engineers, eleven Emergency Medical Technicians, one paid part-time Secretary, and one paid full-time maintenance worker. The department covers an area of approximately nine square miles, with Mutual Aid Agreements with Kings County Fire, Hanford City Fire and the Naval Air Station Lemoore.

Table 3.4.15-1
Fire Service Existing and Future Demand

	Existing (2006)	Demand Buildout (2030)
Staffing	35 volunteers	72 volunteers
Facilities	2	3

(City of Lemoore , 2008)

Construction and operation of the proposed project would not be expected to result in an increase in demand of fire protection services leading to the construction of new or physically altered facilities. Fire suppression support is provided by the City of Lemoore Volunteer Fire Department (LVFD), which has two fire stations and the closest station to the project site is located at 210 Fox Street, approximately 2.5 miles east of the project site.

The project will increase the local school population by approximately 232 students. The project will not result in significant environmental impacts related to acceptable service ratios, response times, or to other performance objectives fire protection services.

The City of Lemoore will ensure that construction activities would be in accordance with local and State fire codes. Fire protection services are adequately planned for within the City's General Plan through policies to ensure the City maintains Fire Department performance and response standards by allocating the appropriate resources. The project applicant is responsible for constructing any infrastructure needed to serve the project and pay the appropriate impact fees, which would reduce impacts to fire protection to less-than-significant levels.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.15a(ii) – Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services – police protection?

The Police Department has a staff of 31 sworn peace officers and seven civilian staff members. There are 30 vehicles assigned to the department.

The Police Department currently operates at a ratio of 1.33 officers per thousand residents, which is lower than the Western U.S. average of 1.5 officers per thousand residents reported by the Federal Bureau of Investigation. Average response times in 2006 averaged between 2.1 to 6.1 minutes depending on the priority type. Response times and the ability of the Police

Department to provide acceptable levels of service are contingent on increasing staffing levels, sworn and civilian, consistent with resident population increase and the population of visitors, merchants, schools, and shoppers with the department's service area.

Table 3.4.15-2
Police Service Existing and Future Demand

	Existing (2006)	Demand Buildout (2030)
Sworn Officers	31	64
Population	23,390	48,250

(City of Lemoore , 2008)

The City's police station is located at 657 Fox Street, approximately three miles northeast of the project site. The project will increase the local population by approximately 232 students. The project will not result in significant environmental impacts related to acceptable service ratios, response times, or to other performance objectives police protection services. Therefore, impacts on police protection services would therefore be considered less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.15a(iii) – Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response

The project is not anticipated to result in the need for additional schools in the area. Therefore, impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.15a(iv) – Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause

significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services – parks?

The nearest park to the site is two miles east. The project is not anticipated to result in a significantly greater usage of the parks in the project vicinity. Therefore, impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.15a(v) – Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or to other performance objectives for any of the public services – other public facilities?

Community facilities are the network of public and private institutions that support the civic and social needs of the population. They offer a variety of recreational, artistic, and educational programs and special events. New community facilities are not specifically sited on the General Plan Land Use Diagram. Small-scale facilities are appropriately sited as integral parts of neighborhoods and communities, while existing larger-scale facilities are generally depicted as public/semi-public land use, as appropriate (City of Lemoore , 2008).

The proposed project does not include any impacts to other public facilities such as libraries, hospitals or emergency medical facilities. The proposed project would comply with the goals, policies, and implementation measures of the General Plan.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.16 - RECREATION				
Would the project:				
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☒	☐

Discussion

Impact #3.4.16a – Would the project Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment. Therefore, the project would have a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.16b – Would the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

See Impact #3.4.15a, above.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.17 - TRANSPORTATION AND TRAFFIC					
Would the project:					
a.	Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☒	☐	☐
b.	Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	☐	☐	☒	☐
c.	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d.	Result in inadequate emergency access?	☐	☐	☒	☐

Discussion

A Traffic Study was prepared for this project (Ruettgers & Schuler Civil Engineers, 2020), and is included in Appendix D.

Impact #3.4.17a – Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

The project trip generation and design hour volumes shown in Table 3.4.17-1 were estimated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Rates and directional splits for ITE Land Use Code 540 (Junior/Community College: Students, Weekday, Peak Hour of Adjacent Street Traffic) were used to estimate project trip generation based on a total of 232 students. The AM and PM peak hours of adjacent street traffic was determined to be between 7:00 a.m. and 8:00 a.m., and between 4:30 p.m. and 5:30 p.m., based on a review of historical count data.

Table 3.4.17-1
Project Estimated Trips

General Information			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE Code	Development Type	Variable	ADT RATE	ADT	Rate	In % Split/ Trips	Out % Split/ Trips	Rate	In % Split/ Trips	Out % Split/ Trips
540	Junior/Community College	232 Students	eq	1012	eq	81% 92	19% 22	eq	56% 51	44% 40

Transit

The Kings Area Rural Transit (KART) operates two transit routes in the study area. Route 12, KART Transit Center to Skyline and Union, has stops at Bush and Belle Haven and West Hills College (WHC). The route operates Monday through Friday with three a.m. and two p.m. stops starting around 8:10 a.m. and stopping at 5:00 p.m. Route 20, KART Transit Center to WHC, likewise has stops at Bush and Belle Haven and WHC. This route operates Monday through Friday from approximately 6:10 a.m. to 10:40 a.m. with 30-minute headways.

Bike

A Class 1 bike path is located along the south side of Bush Street between College Avenue and Belle Haven Drive. Class 1, shared use paths, are non-motorized facilities, paved or unpaved, physically separated from motorized vehicular traffic by an open space or barrier. Additional bike facilities are planned for Bush Street east and west of the current bike path, College Avenue, Semas Avenue (new alignment), Pederson Street, 19 ½ Avenue, the Union Pacific Railroad alignment, and the trail and gas pipeline easement that runs through the project site.

Roadways

The City of Lemoore does not have an adopted level of service standard, however, per the General Plan most traffic studies are using a LOS "D" as their standard for traffic impact study purposes. Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities.

As shown in Table 3.4.17-2, Bush Street and State Route 41 Southbound Ramps operates below an acceptable level of service in the existing year prior to the addition of project traffic. All other intersections within the scope of the study are anticipated to operate at an acceptable level of service prior to and with the addition of project traffic.

In 2024, Bush Street and Semas Drive is anticipated to operate below an acceptable level of service prior to the addition of project traffic. With the addition of project traffic, Bush Street and S. 19 ½ Avenue is anticipated to operate below an acceptable level of service. All other intersections within the scope of the study are anticipated to operate at an acceptable level of service prior to and with the addition of project traffic.

Table 3.4.17-2
Traffic Conditions Analysis

Street	2020 Directional LOS		2024 Directional LOS		2040 Directional LOS	
	East AM/PM	West AM/PM	East AM/PM	West AM/PM	East AM/PM	West AM/PM
Bush St: College Ave to Semas Dr	A/B	C/B	B/B	B/B	C/C	C/C
Bush St: Semas Dr to Belle Haven Dr	B/B	B/B	B/B	B/B	C/B	C/B
Bush St: Belle Haven Dr to SR 41 SB	B/B	B/B	B/B	B/B	C/B	C/B
Bush St: SR 41 SB to SR 41 NB	A/A	A/A	A/A	A/A	A/A	B/A
Bush St: SR 41 NB to N 19 ½ Ave	A/A	A/A	A/A	A/A	A/A	B/A
Street	**2020+Project Directional LOS**		**2024+Project Directional LOS**		**2040+Project Directional LOS**	
Bush St: College Ave to Semas Dr	B/C	B/B	B/B	B/B	C/C	C/C
Bush St: Semas Dr to Belle Haven Dr	B/B	B/B	B/B	B/B	C/B	C/B
Bush St: Belle Haven Dr to SR 41 SB	B/B	B/B	B/B	C/B	C/C	C/C
Bush St: SR 41 SB to SR 41 NB	A/A	A/A	A/A	A/A	A/A	B/A
Bush St: SR 41 NB to N 19 ½ Ave	A/A	A/A	A/A	A/A	A/A	B/A

In 2040, Bush Street and Belle Haven Drive and Bush Street and State Route 41 Northbound Ramps are anticipated to operate below an acceptable level of service prior to the addition of project traffic. The remaining intersections within the scope of study are anticipated to operate at acceptable levels of service during the peak hour.

To mitigate the intersections that are projected to operate below the appropriate adopted level of service standard, MM TRA-1 should be implemented.

MITIGATION MEASURE(S)

MM TRA-1: Intersection and roadway improvements needed by the year 2040 to maintain or improve the operational level of service of the street system in the vicinity include:

- Install a signal at Bust St & Semas Dr
- Install a signal at Bust St & Belle Haven Dr
- Install a signal at Bust St & SR 41 SB Ramps
- Install a signal at Bust St & SR 41 NB Ramps

- Install a signal at Bust St & S. 19th ½ Ave

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

Impact #3.4.17b – Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

An evaluation of vehicle miles traveled (VMT) for project traffic was conducted based on applicable California Environmental Quality Act (CEQA) Guidelines. The analysis involved comparing an estimate of VMT attributable to the project to a baseline VMT and assessing whether project VMT would result in a significant transportation impact. Following CEQA Guidelines, only passenger vehicles were included in the analysis.

Several factors were taken into consideration when estimating project VMT, including proposed land use, project trip type and distribution, and location of other land developments. 82.8 percent of project traffic is anticipated to be students, 15.7 percent of project traffic is anticipated to be faculty and staff, and 1.5 percent is anticipated to be heavy truck trips. Of the staff and faculty trips, 40 percent were anticipated to be local trips and 60 percent were anticipated to be traveling from other towns such as Hanford, Visalia, and Fresno. No pass-by trips are anticipated since there are no other land developments in the vicinity of the project.

As shown in Table 3.4.17-3, it is anticipated that the project would result in an average VMT of 5.49 miles per person. An average regional VMT of 8.37 miles per capita for the year 2020 was obtained from the Kings County 2018 Regional Transportation Plan.

Table 3.4.17-3
Traffic Conditions Analysis

Trip Type	Project ADT	Weighted Average	Miles Traveled	VMT per Trip	Vehicle Occupancy	VMT per Person
Staff/Faculty	159	9.30	1,477	9.30	1	9.30
Student	838	4.0	3,352	4.0	1	4.0
Heavy Trucks	15	47.6	723	47.6	1	47.6
Total	**1,012**		**Weighted Average**			**5.49**

The average project VMT of 5.49 miles per person is more than 15 percent less than the baseline average VMT of 8.37 miles per capita. Therefore, the project would have less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant.***

Impact #3.4.17c – Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The project will be designed to current standards and safety regulations. All intersections will be constructed as to comply with the City and Caltrans regulations, and design and safety standards of Chapter 33 of the California Building Codes (CBC) and the guidelines of Title 24 in order to create safe and accessible roadways.

Vehicles exiting the subdivision will be provided with a clear view of the roadway without obstructions. Landscaping associated with the entry driveways could impede such views, if improperly installed. Specific circulation patterns and roadway designs will incorporate all applicable safety measures to ensure that hazardous design features or inadequate emergency access to the site or other areas surrounding the project area would not occur.

Therefore, with the incorporated design features and all applicable rules and regulations, the project will have a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.17d – Would the project result in inadequate emergency access?

See the discussion in Impact #3.4.9f.

State and City Fire Codes establishes standards by which emergency access may be determined. The proposed project would have to provide adequate unobstructed space for fire trucks to turn around. The proposed project site would have adequate internal circulation capacity including entrance and exit routes to provide adequate unobstructed space for fire trucks and other emergency vehicles to gain access and to turn around.

The proposed project would not inhibit the ability of local roadways to continue to accommodate emergency response and evacuation activities. The proposed project would not interfere with the District's established Emergency Response Plan.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.18 - TRIBAL CULTURAL RESOURCES				
Would the project:				
a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	☒	☐	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Discussion

Impact #3.4.18a(i) – Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?

Please see Impacts #3.4.5a, #3.4.5b, and #3.4.5d, above.

On December 10, 2020 letters were mailed to tribes listed in Appendix B. The letters included a brief project description and location maps (Appendix B). To date, no response has been received from any of the Indian tribes contacted.

On November 24, 2020, the Native American Heritage Commission (NAHC) was asked to conduct a search of its Sacred Lands File to identify previously recorded sacred sites or cultural resources of special importance to tribes and provide contact information for local Native American representatives who may have information about the project area. The NAHC responded on December 18, 2020, with its findings and attached a list of Native American tribes and individuals culturally affiliated with the project area.

With implementation of Mitigation Measures MM CUL-1 through MM CUL-2, the project would not cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources.

MITIGATION MEASURE(S)

Implement MM CUL-1 through MM CUL-2.

LEVEL OF SIGNIFICANCE

Impact would be ***less than significant with mitigation incorporated.***

Impact #3.15.17a(ii) - Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Please see Impacts #3.4.5a, #3.4.5b, and #3.4.5d, above.

With implementation of Mitigation Measures MM CUL-1 through MM CUL-2, the project would not cause a substantial adverse change in the significance of a tribal cultural resource that is a resource determined by the Lead Agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1.

MITIGATION MEASURE(S)

Implement MM CUL-1 through MM CUL-2.

LEVEL OF SIGNIFICANCE

Impact would be ***less than significant with mitigation incorporated***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.19 - Utilities and Service Systems				
Would the project:				
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☒	☐	☐
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e. Comply with federal, State, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

Discussion:

Impact #3.4.19a – Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

The project would be constructed on land that has already been designated for commercial facilities in the General Plan. The City has indicated that the infrastructure necessary to serve the project is available and sufficient and will connect to the City's existing water and sewer systems. The project is located within the planned future growth and service area for the City services.

Therefore, no additional sewer capacity would be required for the proposed project. Impacts are considered less than significant.

The City of Lemoore belongs to the San Joaquin Valley Power Authority, which was formed in November 2006, to develop and conduct electricity-related programs for the region. The San Joaquin Valley Power Authority is the governing body authorized by Community Choice, created by the California legislature in 2002, to provide an opportunity for local government (cities, counties or combinations of cities and counties) to purchase electricity on behalf of their residents and businesses. Community Choice is only for the purchase of electricity. The delivery, metering, billing, operation and maintenance of wires and poles remains the responsibility of PG&E within Lemoore (City of Lemoore , 2008).

There is existing trunk and transmission facilities adequate to meet present and projected demand in the community. The project will connect to the existing transmission lines for electrical power. Telecommunication requirements for the project are typical of this type of land use and would not require any expansion or construction of new telecommunication facilities.

The proposed project would not require or result in the construction or expansion of existing of new water, wastewater treatment, electrical or telecommunications facilities. Therefore, the project would have a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.19b – Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

As noted in Impact #3.4.10b, the Tulare Lake Subbasin total storage capacity is estimated to be 17,100,000 acre-feet to a depth of 300 feet, and 82,500,000 acre-feet to the base of fresh groundwater. According to the 2015 Urban Water Management Plan, the City's 2015 maximum day demand is approximately 12.8 mgd. As noted in Section 3.4.10b, the existing college campus uses approximately 0.068 acre feet of water monthly (City of Lemoore, 2020). The proposed project will minimally increase the student population by five percent or 232 students. Since students commute and do not live on campus, this increase would not substantially increase water demand. It is anticipated that the subbasin has sufficient water available to supply the project.

The project will connect to the existing water supply system. The usage of water would be consistent with the City's current demands. The proposed increase in water usage at the project site is minimal and not anticipated to require the construction of new water facilities or the expansion of existing facilities. Impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.19c – Would the project result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

The project will connect to the existing City sewer system. The generation of wastewater and water would be consistent with the City requirements. The proposed increase in water and wastewater usage at the project site is minimal and is not anticipated to require the construction of new water or wastewater treatment facilities or the expansion of existing facilities. Impacts would be less than significant.

The project will connect to the existing storm drain lines. The site engineering and design plans for the proposed project would be required to implement BMPs, comply with requirements of the City Building and Development Standards and comply with the NPDES General Permit during construction. Implementation of MM GEO-1 would reduce impacts to less than significant.

Therefore, the project would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities.

MITIGATION MEASURE(S)

Implementation of MM GEO-1.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant.***

Impact #3.4.19d – Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Implementation of the proposed project would result in the generation of solid waste on the site, which would increase the demand for solid waste disposal. During construction these materials, which are not anticipated to contain hazardous materials, would be collected and transported away from the site to an appropriate disposal facility.

Solid waste disposal for Lemoore is managed by Kings Waste and Recycling Authority (KWRA). The City's PWD Refuse Division is responsible for solid waste collection services. The majority of the City's solid waste is taken to the Kettleman Hills non-hazardous landfill facility, owned by Chemical Waste Management (CWMI). The facility is located south of Lemoore and has an available capacity of 15.6 million cubic yards as of 2020 (Cal Recycle , 2020). KWRA is currently studying the future needs of solid waste services including building a new landfill to be operated by CWMI near the existing site. The County has a 25-year contract with CWMI to handle its solid waste until 2023 (City of Lemoore , 2008).

The project, in compliance with federal, State, and local statutes and regulations related to solid waste, would dispose of all waste generated onsite at an approved solid waste facility. The project does not, and would not conflict with federal, State, or local regulations related to solid waste. The proposed project would be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs in compliance with federal, State, and local statutes and regulations related to solid waste. Therefore, the project would have a less-than-significant impact.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.19e – Would the project comply with federal, State, and local management and reduction statutes and regulations related to solid waste?

See discussion for Impact #3.4.19d.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.20 - WILDFIRE				
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or	☐	☐	☒	☐
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

Discussion:

Impact #3.4.20a – Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

See Impact #3.4.9f regarding emergency response.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.20b – Would the project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire?

Wildfire hazard data for the Lemoore Planning Area is provided by the California Department of Forestry and Fire Protection, as summarized in Table 3.4.20-1. The majority of the City is considered to have either little or no threat or a moderate threat of wildfire. Only one percent of the Planning Area currently has a high threat of wildfire. Wildfire hazard present in the Planning Area should decrease as vacant parcels become developed.

Table 3.4.20-1
Existing Wildfire Hazards

Fire Hazards	Acreage	Percent of City Area
Little or No Threat	5,648	46
Moderate	6,494	53
High	85	1
Very High	0	0
Total	**12,227**	**100**

There are no other factors of the project or the surrounding area that would exacerbate wildfire risks, and thereby expose project occupants to pollutant concentration from a wildfire or the uncontrolled spread of a wildfire. Therefore, impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.20c – Would the project, require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines?

See Impacts #3.4.20a and b, above.

As discussed above, the proposed project site is not located in or near State responsibility areas or lands classified as very high hazard severity zones. Additionally, the project would not require the installation or maintenance of infrastructure that would exacerbate fire risk or result in environmental impacts. Therefore, impacts would be less than significant.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

Impact #3.4.20d – Would the project, expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The project site is not located near the ocean or a steep topographic feature (i.e., mountain, hill, bluff, etc.). Additionally, there is no body of water within the vicinity of the project site. As shown in Figure 3.4.10-1, the project is not located within a FEMA 100-year floodplain. According to FEMA, the site is located in an area of minimal flood hazard and has a less than 0.2 percent chance of an annual flooding. As such, the project would not place housing within a 100-year flood hazard area as mapped on a federal flood hazard boundary or flood insurance rate map or other flood hazard delineation map.

Therefore, the project will not expose people or structures to risks of flooding, landslides, runoff, slope instability, or drainage changes.

MITIGATION MEASURE(S)

No mitigation is required.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.4.21 - MANDATORY FINDINGS OF SIGNIFICANCE				
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐
c. Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Discussion:

Impact #3.4.21a – Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

As evaluated in this IS/MND, the proposed project would not substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; reduce the number or restrict the range of an endangered, rare, or threatened species; or eliminate important examples of the major periods of California history or prehistory. Mitigation measures have been included to lessen the significance of potential impacts. Similar mitigation measures would be expected of other projects in the surrounding area, most of which share a similar cultural paleontological and biological resources. Consequently, the incremental effects of the proposed project, after mitigation, would not contribute to an adverse cumulative impact on these resources. Therefore, the project would have a less-than-significant impact with mitigation incorporated.

MITIGATION MEASURE(S)

Implement MM BIO-1 through MM BIO-8; MM CUL-1 through MM CUL-2.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

Impact #3.4.21b - Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

As described in the impact analyses in Sections 3.4.1 through 3.4.20 of this IS/MND, any potentially significant impacts of the proposed project would be reduced to a less-than-significant level following incorporation of the mitigation measures. All planned projects in the vicinity of the proposed project would be subject to review in separate environmental documents and required to conform to the City of Lemoore General Plan, zoning, mitigate for project-specific impacts, and provide appropriate engineering to ensure the development meets are applicable federal, State and local regulations and codes. As currently designed, and with compliance of the recommended mitigation measures, the proposed project would not contribute to a cumulative impact. Thus, the cumulative impacts of past, present, and reasonably foreseeable future projects would be less than cumulatively considerable.

MITIGATION MEASURE(S)

Implement MM BIO-1 through MM BIO-8, MM CUL-1 through MM CUL-2, MM GEO-1 through MM GEO-3, MM HYD-1, and MM TRA-1.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

Impact #3.4.21c - Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?

All of the project's impacts, both direct and indirect, that are attributable to the project were identified and mitigated to a less-than-significant level. The project will have the appropriate engineering to ensure the development meets are applicable federal, State and local regulations and codes. Thus, the cumulative impacts of past, present, and reasonably foreseeable future projects would be less than cumulatively considerable. Therefore, the proposed project would not either directly or indirectly cause substantial adverse effects on human beings because all potentially adverse direct impacts of the proposed project are identified as having no impact, less-than-significant impact, or less-than-significant impact with mitigation incorporated.

MITIGATION MEASURE(S)

Implement MM BIO-1 through MM BIO-8, MM CUL-1 through MM CUL-2, MM GEO-1 through MM GEO-3, MM HYD-1, and MM TRA-1.

LEVEL OF SIGNIFICANCE

Impacts would be ***less than significant with mitigation incorporated***.

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SECTION 5 - LIST OF PREPARERS

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- Ronald W. Hunter- Managing Principal Consultant

Ruettgers and Schuler: Transportation

- Ian Parks, Principal Engineer

BSK Associate: Soils, Geology

- South Valley Regional Manager

SECTION 6 - MITIGATION MONITORING AND REPORTING PROGRAM

RESERVED- to be included later

APPENDIX A

SMALL PROJECT ANALYSIS LEVEL ASSESSMENT

SMALL PROJECT ANALYSIS LEVEL ASSESSMENT

West Hills CCD Lemoore
Lemoore, CA

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December 2020

Project 200505.0231

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1. EXECUTIVE SUMMARY

1.1 Executive Summary

Trinity Consultants (Trinity) has completed a limited air quality assessment for the West Hills Community College, Lemoore campus. The Project includes the construction of a new 42,000 square foot, two-story Instruction Center on an undeveloped but disturbed portion of the existing campus.

This limited air quality assessment uses the San Joaquin Valley Air Pollution Control District's (SJVAPCD) screening tool, Small Project Analysis Level (SPAL) (SJVAPCD 2020). This SPAL assessment was prepared pursuant to the SJVAPCD's Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI) (SJVAPCD 2015), the California Environmental Quality Act (CEQA) (Public Resources Code 21000 to 21189) and the CEQA Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000 – 15387).

1.2 Statement of Finding

Based on the SPAL established by the SJVAPCD's GAMAQI, the emissions estimates prepared pursuant to this SPAL assessment do not exceed the SJVAPCD's established emissions thresholds and significance thresholds for all CEQA air quality determinations; this Project would therefore not pose a significant impact to the San Joaquin Valley Air Basin and would have a less than significant air quality impact.

2. PROJECT INFORMATION

2.1 Introduction

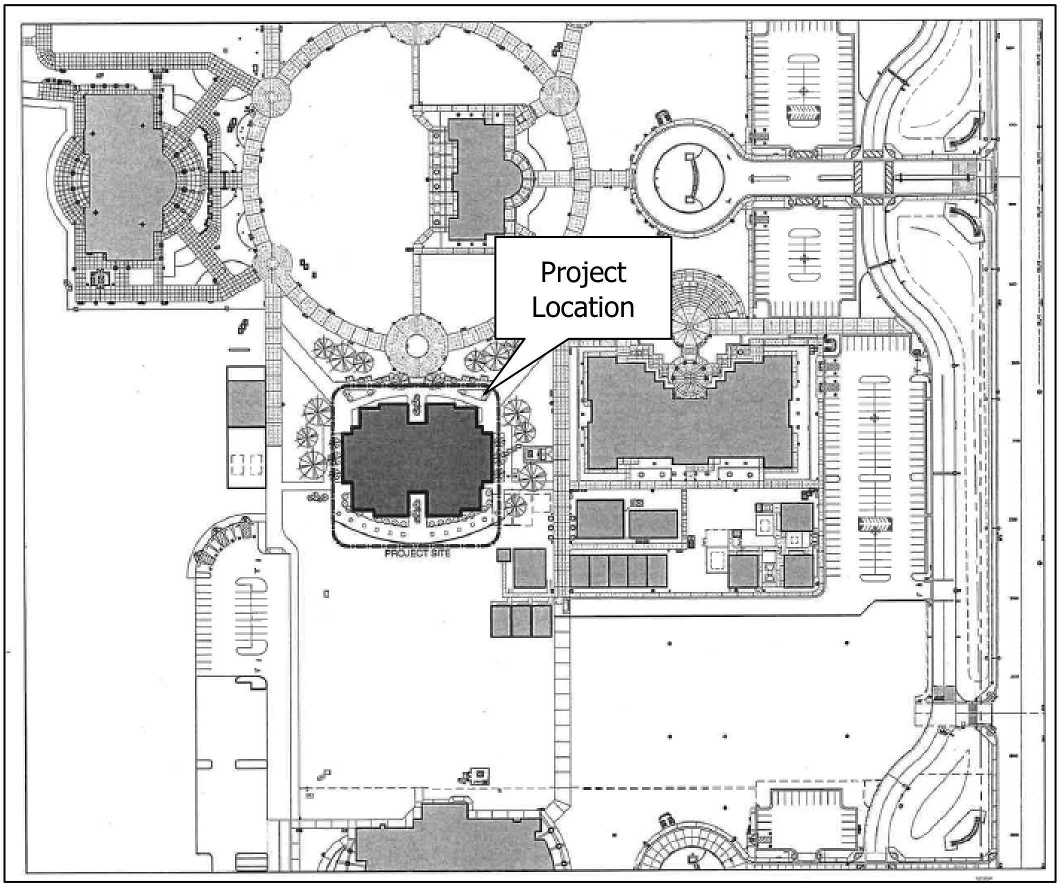
The Project site is located at the West Hills Community College, Lemoore campus. The Project includes the construction of a new 42,000 square foot, two-story Instruction Center on an undeveloped but disturbed portion of the existing campus. The Project was assessed as if it would be developed in one phase. This assessment examines the projected gross impacts to air quality posed by this Project to the San Joaquin Valley Air Basin to determine whether or not the Project remains below established air quality thresholds of significance.

2.2 Project Location

The Project is located in Lemoore, California near the southwest corner of Bush Street and College Avenue. **Figure 2-1** depicts the Project location within the City of Lemoore and **Figure 2-2** depicts the proposed site plan.

Figure 2-1. Project Location

Figure 2-2. Proposed Site Plan



3. SMALL PROJECT ANALYSIS LEVEL QUALIFICATION

This assessment was prepared pursuant to the SJVAPCD's GAMAQI (SJVAPCD 2015), the CEQA (Public Resources Code 21000 to 21189) and CEQA Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000 – 15387). The SJVAPCD created the SPAL screening tool to streamline air quality assessments of commonly encountered projects. According to GAMAQI, the SJVAPCD "pre-calculated the emissions on a large number and types of projects to identify the level at which they have no possibility of exceeding the emissions thresholds"[1].

The SJVAPCD SPAL process established review parameters to determine whether a project qualifies as a "small project." A project that is found to be "less than" the established parameters has "no possibility of exceeding criteria pollutant emissions thresholds." **Table 3-1** presents the SPAL size parameters for educational projects, and **Table 3-2** presents the SPAL daily trip parameters for educational projects.

Table 3-1. Small Project Analysis Level in Units for Educational

Land Use Category - Educational	Project Size (square feet)*
Elementary	156,000
Junior High School	168,800
High School	153,600
Junior College (2 year)	74,400
University/College (4 year)	1,200 students
Library	38,400
Place of Worship	141,000
Proposed Project – Junior College	42,000
SPAL Exceeded?	**No**
*Project size based on SPAL Table 5, as posted on SJVAPCD webpage: https://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI-SPAL.PDF	

As shown in **Table 3-1**, the proposed Project would not exceed the established SPAL limits for a "Junior College" educational project. The Project would construct a new 42,000 square foot, two-story Instruction Center on an undeveloped but disturbed portion of the existing campus.

Table 3-2. Small Project Analysis Level in Daily Trips for Educational

Land Use Category - Educational	Average Daily Trips (non-HHD)*	Average Daily Trips (HHD)*
Elementary	1,000	15
Junior High School		
High School		
Junior College (2 year)		
University/College (4 year)		
Library		
Place of Worship		
Proposed Project – Junior College	997	15
SPAL Exceeded?	**No**	**No**
*Daily trips based on SPAL Table 5, as posted on SJVAPCD webpage: https://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI-SPAL.PDF		

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[1] SJVAPCD GAMAQI, Section 8.3.4, Page 85.

As shown in **Table 3-2**, the proposed Project would not exceed the established SPAL limits for a "Junior College" educational project. The Project would include 997 additional daily trips for all vehicle types except HHD and 15 additional daily trips for HHD vehicles. The SPAL threshold for HHD trips is based on a 50-mile trip length. Per traffic estimations from Ruettgers and Schuler, the HHD trips for the proposed Project are based on a 47.6-mile trip length.

Based on the above information, this Project qualifies for a limited air quality analysis applying the SPAL guidance to determine air quality impacts.

4. AIR QUALITY IMPACTS THRESHOLDS AND EVALUATION METHODOLOGY

Significance thresholds are based on the CEQA Appendix G Environmental Checklist Form (not included herein) and SJVAPCD air quality thresholds (SJVAPCD 2015). A potentially significant impact to air quality, as defined by the CEQA Checklist, would occur if the project caused one or more of the following to occur:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; and/or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The SJVAPCD has identified quantitative emission thresholds to determine whether the potential air quality impacts of a project require analysis in the form of an Environmental Impact Report. The SJVAPCD air quality thresholds from the GAMAQI are presented in **Table 4-1** (SJVAPCD 2015). The SJVAPCD separates construction emissions from operational emissions, and further separates permitted operational emissions from non-permitted operational emissions, for determining significance thresholds for air pollutant emissions.

Table 4-1. SJVAPCD Air Quality Thresholds of Significance - Criteria Pollutants

Pollutant/ Precursor	Construction Emissions	Operational Emissions	
		Permitted Equipment and Activities	Non-Permitted Equipment and Activities
	Emissions (tpy)	Emissions (tpy)	Emissions (tpy)
CO	100	100	100
NOx	10	10	10
ROG	10	10	10
SOx	27	27	27
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15

Source: SJVAPCD 2015

Criteria pollutant emissions were estimated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2 (California Air Pollution Control Officers Association (CAPCOA) 2016). This project would generate short-term construction emissions and long-term operational emissions.

An air quality evaluation also considers: 1) exposure of sensitive receptors to substantial pollutant concentrations; and 2) the creation of other emissions (such as those leading to odors) adversely affecting a substantial number of people. The criteria for this evaluation are based on the Lead Agency's determination of the proximity of the proposed Project to sensitive receptors. A sensitive receptor is a location where human populations, especially children, senior citizens and sick persons, are present, and where there is a reasonable expectation of continuous human exposure to pollutants, according to the averaging period for ambient air quality standards, i.e., the 24-hour, 8-hour or 1-hour standards. Commercial and industrial sources are not considered sensitive receptors.

5. PROJECT-RELATED EMISSIONS

This document was prepared pursuant to the SJVAPCD's GAMAQI and SPAL guidelines and provides a cursory review of the Project emissions to demonstrate that it would not exceed established air quality emissions thresholds.

5.1 Short-Term Emissions

Table 5-1 shows the construction emission levels using default CalEEMod factors for construction of a new 42,000 square foot, two-story Instruction Center on an undeveloped but disturbed portion of the existing campus (see Attachment A).

Construction emission estimates also included the following SJVAPCD's required measures for all projects:

- Water exposed area 3 times per day; and
- Reduce vehicle speed to less than 15 miles per hour.

Based on these anticipated activity levels, the Project construction activities would not exceed construction thresholds (**Table 4-1**). Therefore, construction emissions were found to be less than significant, and no further evaluation is required.

Table 5-1. Construction Emissions

Emissions Source	Pollutant					
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
	(tons/year)					
2023 Construction Emissions	0.10	0.91	1.01	0.002	0.08	0.05
2024 Construction Emissions	0.31	0.20	0.25	0.000	0.02	0.01
SJVAPCD Construction Emissions Thresholds	10	10	100	27	15	15
Is Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

5.2 Long-Term Emissions

Table 5-2 presents the Project's long-term operations emissions generated from mobile, energy, and area sources as well as from water use and waste generation emissions. Most of these emissions impacts are from mobile sources traveling to and from the Project area. The following changes to default values were incorporated during the CalEEMod analysis:

- Daily trip rate for non-HHD vehicles was updated to 997 trips per day according to the Traffic Study (Ruettgers & Schuler 2020)
  - Trip rate was split into 159 trips per day for staff/faculty, with an average trip length of 9.3 miles, and 838 trips per day for students, with an average trip length of 4 miles.
- Daily trip rate for HHD vehicles was updated to 15 trips per day, with an average trip length of 47.6 miles, according to the Traffic Study (Ruettgers & Schuler 2020)

Operational emission estimates also included the following mitigation measures even though the project was less than significant before mitigation:

- Improved Destination Accessibility;

- Improved Pedestrian Network;
- Use electric lawnmower, leaf blower, and chainsaw (3% per SJVAPCD).

Table 5-2. Total Project Operational Emissions

Emissions Source	Pollutant					
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
	(tons/year)					
Unmitigated						
Operational Emissions	0.38	2.38	2.00	0.01	0.87	0.24
SJVAPCD Operational Emissions Thresholds – non-permitted sources	10	10	100	27	15	15
Is Threshold Exceeded Before Mitigation?	**No**	**No**	**No**	**No**	**No**	**No**
Mitigated						
Operational Emissions	0.38	2.34	1.91	0.01	0.81	0.22
SJVAPCD Operational Emissions Thresholds – non-permitted sources	10	10	100	27	15	15
Is Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

As calculated (see **Attachment A**), the long-term operational emissions associated with the proposed Project would be less than SJVAPCD significance threshold levels and would, therefore, not pose a significant impact to criteria air pollutants. This finding is consistent with the SPAL screening thresholds.

5.3 Greenhouse Gas Emissions

The Project's greenhouse gas (GHG) emissions are primarily from mobile source activities. Not all GHGs exhibit the same ability to induce climate change; as a result, GHG contributions are commonly quantified as carbon dioxide equivalents (CO_2e) (**see Attachment A**). The proposed Project's operational CO_2e emissions were estimated using CalEEMod. These emissions are summarized in **Table 5-3**.

Table 5-3. Estimated Annual Greenhouse Gas Emissions

	CO_2 Emissions metric tons	CH_4 Emissions metric tons	N_2O Emissions metric tons	CO_2e Emissions metric tons
2024 Project Operations	1,298.58	0.82	0.004	1,320.16
2005 BAU	1,928.57	1.44	0.004	1,965.82
BAU less Project emissions				32.8%

The current inventory and forecast for GHG emissions in the California Air Resources Board's 2008 Climate Change Scoping Plan supports the 2011 IPPC estimates. The 2008 Climate Change Scoping Plan also indicates that GHG emissions will increase to 596.41 million metric tons of CO_2e by 2020. It is widely understood that climate change is a "global" issue and, as such, GHG emissions are a cumulative problem and can only be evaluated as such.

The amount of CO_2 that would be generated by the Project is so small in relation to the California CO_2 equivalent estimates for 2020 (596 million metric tons CO_2e) that it's not possible for the contribution of the project to be cumulatively considerable. Additionally, the Project's GHG emissions are less than the 2005 business as usual emissions for the Project by 645.66 metric tons CO_2e, which is a 32.8% reduction. Therefore, the Project would not generate a cumulatively considerable GHG impact nor would it conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. The Project will also not conflict with any elements of the California Air Resources Board's 2008 Climate Change Scoping Plan. Therefore, this potential impact is less than significant.

5.4 Potential Impact on Sensitive Receptors

The proposed Project is located near the southwest corner of Bush Street and College Avenue. Sensitive receptors are defined as areas where young children, chronically ill individuals, the elderly, or people who are more sensitive than the general population reside. Schools, hospitals, nursing homes and daycare centers are locations where sensitive receptors would likely reside. There are currently sensitive receptors at the existing Lemoore University Elementary Charter and Lemoore Middle College High School located on the proposed Project site. There are no other known schools, hospitals, or nursing homes within a one-mile radius of the Project.

Based on the predicted operational emissions and activity types, the proposed Project is not expected to affect any on-site or off-site sensitive receptors and is not expected to have any adverse impacts on any known sensitive receptor.

5.5 Potential Impacts to Visibility to Nearby Class 1 Areas

It should be noted that visibility impact analyses are not usually conducted for area sources. The recommended analysis methodology was initially intended for stationary sources of emissions which were subject to the Prevention of Significant Deterioration (PSD) requirements in 40 CFR Part 60. Since the Project's emissions are predicted to be significantly less than the PSD threshold levels, an impact at either the Dome Land Wilderness or the Sequoia National Park Areas (the two nearest Class 1 areas to the Project) is extremely unlikely. Therefore, based on the Project's predicted emissions, the Project is not expected to have any adverse impact to visibility at any Class 1 Area.

5.6 Potential Odor Impacts

The proposed Project is a junior college building surrounded by open land. Expected uses are not known to be a source of nuisance odors and are not listed in Table 6 of the SJVAPCD's GAMAQI. The Project is therefore not anticipated to have substantial odor impacts. The Project is therefore anticipated to have a less than significant odor impact.

5.7 Ambient Air Quality Impacts

As stated in the of GAMAQI (2015, p 96-97), SJVAPCD has developed screening levels for requiring an Ambient Air Quality Analysis (AAQA). The SJVAPCD recommends that an AAQA be performed for all criteria pollutants when emissions of any criteria pollutant resulting from project construction or operational activities exceed the 100 pounds per day screening level, after compliance with Rule 9510 requirements and implementation of all enforceable mitigation measures.

As shown above in **Table 5-1** and **Table 5-2**, average daily emissions for construction and operational activities associated with this Project would not exceed 100 pounds per day. Therefore, an AAQA is not required for this Project.

5.8 Toxic Air Contaminant (TAC) Impacts

TACs, as defined by the California Health & Safety Code (CH&SC) §44321, are listed in Appendices AI and AII in AB 2588 Air Toxic "Hot Spots" and Assessment Act's Emissions Inventory Criteria and Guideline Regulation document. SJVAPCD's risk management objectives for permitting and CEQA are as follows:

- Minimize health risks from new and modified sources of air pollution.
- Health risks from new and modified sources shall not be significant relative to the background risk levels and other risk levels that are typically accepted throughout the community.
- Avoid unreasonable restrictions on permitting.

The proposed Project is a junior college building and is not expected to generate any TAC emissions. The increase in HHD trucks on-site due to this Project would generate small amounts of TAC emissions. The diesel particulate matter (DPM) generated by the additional HHD trucks is less than 0.1 pound per year. The prioritization score from this additional DPM is less than 1, and therefore the potential health risk impacts would be considered less than significant, and no further health risk assessment is required. The TAC emission calculations and prioritization are provided in Appendix B.

6. CONCLUSIONS

Based on the criteria established by the SJVAPCD's GAMAQI and SPAL guidelines, the proposed Project does not meet the minimum standards to require a full Air Quality Impact Analysis. Furthermore, the Project as proposed would not exceed the SJVAPCD's criteria air pollutant emission levels and would generate *less than significant air quality impacts*.

7. REFERENCES

California Environmental Quality Act (CEQA). 2019. (Public Resources Code 21000 - 21189) and CEQA Guidelines (California Code of Regulations Title 14, Division 6, Chapter 3, Sections 15000 – 15387).

---------. 2019. CEQA, Appendix G – Environmental Checklist Form, Final Text.

California Air Pollution Control Officers Association (CAPCOA). 2016. California Emissions Estimator Model tm (CalEEMod), version 2016.3.2.

----------. 2016. "Air Toxic Hot Spots" Facility Prioritization Guidelines, Revised 2016.

Ruettgers & Schuler. 2020. Proposed Expansion Lemoore Community College Campus.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2020. Small Project Analysis Levels (SPAL), November 13, 2020. https://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI-SPAL.PDF

-----------. 2015. Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI). March 19, 2015. http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf

-----------. 2009. Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. December 17, 2009.

APPENDIX A. CALEEMOD EMISSIONS ESTIMATES OUTPUT FILES

West Hills CCD Lemoore

Kings County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Junior College (2Yr)	42.00	1000sqft	0.96	42,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	37
Climate Zone	3			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Start January 2023, End April 2024

Grading -

Vehicle Trips - Based on vehicle trip adjustment spreadsheet

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation -

Fleet Mix - Based on vehicle trip adjustment spreadsheet

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	5.00	15.00
tblConstructionPhase	NumDays	100.00	297.00
tblConstructionPhase	NumDays	2.00	6.00
tblConstructionPhase	NumDays	5.00	15.00
tblConstructionPhase	NumDays	1.00	3.00
tblFleetMix	HHD	0.17	0.11
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDT1	0.03	0.03
tblFleetMix	LDT2	0.15	0.19
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	4.0800e-003	0.00
tblFleetMix	MCY	5.4520e-003	0.00
tblFleetMix	MDV	0.11	0.00
tblFleetMix	MH	6.1300e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	1.6890e-003	0.00
tblFleetMix	SBUS	9.0400e-004	0.00
tblFleetMix	UBUS	1.6060e-003	0.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	CC_TL	6.60	4.84
tblVehicleTrips	CC_TTP	88.60	82.80
tblVehicleTrips	CNW_TL	6.60	47.60
tblVehicleTrips	CNW_TTP	5.00	1.50
tblVehicleTrips	CW_TL	14.70	9.30
tblVehicleTrips	CW_TTP	6.40	15.70

tblVehicleTrips	DV_TP	7.00	0.00
tblVehicleTrips	PB_TP	1.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	11.23	24.10
tblVehicleTrips	SU_TR	1.21	24.10
tblVehicleTrips	WD_TR	27.49	24.10

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0953	0.9076	1.0134	1.9500e-003	0.0370	0.0416	0.0786	0.0105	0.0383	0.0488	0.0000	173.1500	173.1500	0.0439	0.0000	174.2484
2024	0.3145	0.1998	0.2500	4.7000e-004	8.2000e-003	8.8300e-003	0.0170	2.2000e-003	8.1800e-003	0.0104	0.0000	41.1613	41.1613	0.0101	0.0000	41.4131
Maximum	**0.3145**	**0.9076**	**1.0134**	**1.9500e-003**	**0.0370**	**0.0416**	**0.0786**	**0.0105**	**0.0383**	**0.0488**	**0.0000**	**173.1500**	**173.1500**	**0.0439**	**0.0000**	**174.2484**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0953	0.9076	1.0134	1.9500e-003	0.0352	0.0416	0.0768	9.6700e-003	0.0383	0.0480	0.0000	173.1498	173.1498	0.0439	0.0000	174.2482
2024	0.3145	0.1998	0.2500	4.7000e-004	8.2000e-003	8.8300e-003	0.0170	2.2000e-003	8.1800e-003	0.0104	0.0000	41.1613	41.1613	0.0101	0.0000	41.4130
Maximum	**0.3145**	**0.9076**	**1.0134**	**1.9500e-003**	**0.0352**	**0.0416**	**0.0768**	**9.6700e-003**	**0.0383**	**0.0480**	**0.0000**	**173.1498**	**173.1498**	**0.0439**	**0.0000**	**174.2482**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**4.11**	**0.00**	**1.94**	**6.39**	**0.00**	**1.37**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-2-2023**	**4-1-2023**	0.2450	0.2450
2	**4-2-2023**	**7-1-2023**	0.2520	0.2520
3	**7-2-2023**	**10-1-2023**	0.2548	0.2548
4	**10-2-2023**	**1-1-2024**	0.2550	0.2550
5	**1-2-2024**	**4-1-2024**	0.3092	0.3092
6	**4-2-2024**	**7-1-2024**	0.2018	0.2018
		Highest	0.3092	0.3092

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1933	0.0000	3.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.0000e-004
Energy	5.0000e-003	0.0455	0.0382	2.7000e-004		3.4600e-003	3.4600e-003		3.4600e-003	3.4600e-003	0.0000	189.0427	189.0427	7.2600e-003	2.2100e-003	189.8836
Mobile	0.1805	2.3378	1.9692	0.0124	0.8612	6.2000e-003	0.8674	0.2297	5.7700e-003	0.2355	0.0000	1,152.5852	1,152.5852	0.0884	0.0000	1,154.7954
Waste						0.0000	0.0000		0.0000	0.0000	11.0833	0.0000	11.0833	0.6550	0.0000	27.4584
Water						0.0000	0.0000		0.0000	0.0000	0.6536	6.5235	7.1771	0.0674	1.6500e-003	9.3532
Total	**0.3787**	**2.3832**	**2.0077**	**0.0127**	**0.8612**	**9.6600e-003**	**0.8709**	**0.2297**	**9.2300e-003**	**0.2389**	**11.7369**	**1,348.1521**	**1,359.8890**	**0.8181**	**3.8600e-003**	**1,381.4913**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1933	0.0000	3.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.4000e-004	7.4000e-004	0.0000	0.0000	7.9000e-004
Energy	5.0000e-003	0.0455	0.0382	2.7000e-004		3.4600e-003	3.4600e-003		3.4600e-003	3.4600e-003	0.0000	189.0427	189.0427	7.2600e-003	2.2100e-003	189.8836
Mobile	0.1772	2.2955	1.8707	0.0117	0.8018	5.8400e-003	0.8076	0.2139	5.4300e-003	0.2193	0.0000	1,091.2735	1,091.2735	0.0877	0.0000	1,093.4658
Waste						0.0000	0.0000		0.0000	0.0000	11.0833	0.0000	11.0833	0.6550	0.0000	27.4584
Water						0.0000	0.0000		0.0000	0.0000	0.6536	6.5235	7.1771	0.0674	1.6500e-003	9.3532
Total	**0.3754**	**2.3409**	**1.9092**	**0.0120**	**0.8018**	**9.3000e-003**	**0.8111**	**0.2139**	**8.8900e-003**	**0.2228**	**11.7369**	**1,286.8404**	**1,298.5773**	**0.8174**	**3.8600e-003**	**1,320.1618**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.87**	**1.78**	**4.91**	**5.21**	**6.90**	**3.73**	**6.86**	**6.90**	**3.68**	**6.78**	**0.00**	**4.55**	**4.51**	**0.09**	**0.00**	**4.44**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/2/2023	1/4/2023	5	3	
2	Grading	Grading	1/5/2023	1/12/2023	5	6	
3	Building Construction	Building Construction	1/13/2023	3/4/2024	5	297	
4	Paving	Paving	3/5/2024	3/25/2024	5	15	
5	Architectural Coating	Architectural Coating	3/26/2024	4/15/2024	5	15	

Acres of Grading (Site Preparation Phase): 1.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 63,000; Non-Residential Outdoor: 21,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	2	5.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	18.00	7.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.0000e-004	0.0000	8.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-004	9.2800e-003	5.8900e-003	1.0000e-005		3.4000e-004	3.4000e-004		3.1000e-004	3.1000e-004	0.0000	1.2824	1.2824	4.1000e-004	0.0000	1.2928
Total	**8.0000e-004**	**9.2800e-003**	**5.8900e-003**	**1.0000e-005**	**8.0000e-004**	**3.4000e-004**	**1.1400e-003**	**9.0000e-005**	**3.1000e-004**	**4.0000e-004**	**0.0000**	**1.2824**	**1.2824**	**4.1000e-004**	**0.0000**	**1.2928**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	2.6000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	3.0000e-005	0.0000	0.0709	0.0709	0.0000	0.0000	0.0709
Total	**4.0000e-005**	**3.0000e-005**	**2.6000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0709**	**0.0709**	**0.0000**	**0.0000**	**0.0709**

3.2 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-004	9.2800e-003	5.8900e-003	1.0000e-005		3.4000e-004	3.4000e-004		3.1000e-004	3.1000e-004	0.0000	1.2824	1.2824	4.1000e-004	0.0000	1.2928
Total	**8.0000e-004**	**9.2800e-003**	**5.8900e-003**	**1.0000e-005**	**3.1000e-004**	**3.4000e-004**	**6.5000e-004**	**3.0000e-005**	**3.1000e-004**	**3.4000e-004**	**0.0000**	**1.2824**	**1.2824**	**4.1000e-004**	**0.0000**	**1.2928**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	2.6000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	3.0000e-005	0.0000	0.0709	0.0709	0.0000	0.0000	0.0709
Total	**4.0000e-005**	**3.0000e-005**	**2.6000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0709**	**0.0709**	**0.0000**	**0.0000**	**0.0709**

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.2600e-003	0.0000	2.2600e-003	1.2400e-003	0.0000	1.2400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9400e-003	0.0173	0.0222	4.0000e-005		8.5000e-004	8.5000e-004		8.1000e-004	8.1000e-004	0.0000	3.1255	3.1255	5.7000e-004	0.0000	3.1397
Total	**1.9400e-003**	**0.0173**	**0.0222**	**4.0000e-005**	**2.2600e-003**	**8.5000e-004**	**3.1100e-003**	**1.2400e-003**	**8.1000e-004**	**2.0500e-003**	**0.0000**	**3.1255**	**3.1255**	**5.7000e-004**	**0.0000**	**3.1397**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.1000e-004	1.0600e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.2834	0.2834	1.0000e-005	0.0000	0.2836
Total	**1.5000e-004**	**1.1000e-004**	**1.0600e-003**	**0.0000**	**3.7000e-004**	**0.0000**	**3.8000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.2834**	**0.2834**	**1.0000e-005**	**0.0000**	**0.2836**

3.3 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.8000e-004	0.0000	8.8000e-004	4.8000e-004	0.0000	4.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.9400e-003	0.0173	0.0222	4.0000e-005		8.5000e-004	8.5000e-004		8.1000e-004	8.1000e-004	0.0000	3.1254	3.1254	5.7000e-004	0.0000	3.1397
Total	**1.9400e-003**	**0.0173**	**0.0222**	**4.0000e-005**	**8.8000e-004**	**8.5000e-004**	**1.7300e-003**	**4.8000e-004**	**8.1000e-004**	**1.2900e-003**	**0.0000**	**3.1254**	**3.1254**	**5.7000e-004**	**0.0000**	**3.1397**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	1.1000e-004	1.0600e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.2834	0.2834	1.0000e-005	0.0000	0.2836
Total	**1.5000e-004**	**1.1000e-004**	**1.0600e-003**	**0.0000**	**3.7000e-004**	**0.0000**	**3.8000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.2834**	**0.2834**	**1.0000e-005**	**0.0000**	**0.2836**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0794	0.8055	0.8907	1.4300e-003		0.0402	0.0402		0.0370	0.0370	0.0000	125.7616	125.7616	0.0407	0.0000	126.7784
Total	**0.0794**	**0.8055**	**0.8907**	**1.4300e-003**		**0.0402**	**0.0402**		**0.0370**	**0.0370**	**0.0000**	**125.7616**	**125.7616**	**0.0407**	**0.0000**	**126.7784**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8600e-003	0.0671	0.0139	2.2000e-004	5.2900e-003	6.0000e-005	5.3600e-003	1.5300e-003	6.0000e-005	1.5900e-003	0.0000	21.2857	21.2857	1.6700e-003	0.0000	21.3276
Worker	0.0111	8.2300e-003	0.0795	2.4000e-004	0.0282	1.7000e-004	0.0284	7.5000e-003	1.5000e-004	7.6500e-003	0.0000	21.3405	21.3405	6.0000e-004	0.0000	21.3554
Total	**0.0130**	**0.0753**	**0.0933**	**4.6000e-004**	**0.0335**	**2.3000e-004**	**0.0338**	**9.0300e-003**	**2.1000e-004**	**9.2400e-003**	**0.0000**	**42.6262**	**42.6262**	**2.2700e-003**	**0.0000**	**42.6830**

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0794	0.8055	0.8907	1.4300e-003		0.0402	0.0402		0.0370	0.0370	0.0000	125.7614	125.7614	0.0407	0.0000	126.7783
Total	**0.0794**	**0.8055**	**0.8907**	**1.4300e-003**		**0.0402**	**0.0402**		**0.0370**	**0.0370**	**0.0000**	**125.7614**	**125.7614**	**0.0407**	**0.0000**	**126.7783**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8600e-003	0.0671	0.0139	2.2000e-004	5.2900e-003	6.0000e-005	5.3600e-003	1.5300e-003	6.0000e-005	1.5900e-003	0.0000	21.2857	21.2857	1.6700e-003	0.0000	21.3276
Worker	0.0111	8.2300e-003	0.0795	2.4000e-004	0.0282	1.7000e-004	0.0284	7.5000e-003	1.5000e-004	7.6500e-003	0.0000	21.3405	21.3405	6.0000e-004	0.0000	21.3554
Total	**0.0130**	**0.0753**	**0.0933**	**4.6000e-004**	**0.0335**	**2.3000e-004**	**0.0338**	**9.0300e-003**	**2.1000e-004**	**9.2400e-003**	**0.0000**	**42.6262**	**42.6262**	**2.2700e-003**	**0.0000**	**42.6830**

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0137	0.1374	0.1626	2.6000e-004		6.4900e-003	6.4900e-003		5.9700e-003	5.9700e-003	0.0000	23.0558	23.0558	7.4600e-003	0.0000	23.2422
Total	**0.0137**	**0.1374**	**0.1626**	**2.6000e-004**		**6.4900e-003**	**6.4900e-003**		**5.9700e-003**	**5.9700e-003**	**0.0000**	**23.0558**	**23.0558**	**7.4600e-003**	**0.0000**	**23.2422**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.3000e-004	0.0122	2.4100e-003	4.0000e-005	9.7000e-004	1.0000e-005	9.8000e-004	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	3.8686	3.8686	3.1000e-004	0.0000	3.8765
Worker	1.9100e-003	1.3600e-003	0.0134	4.0000e-005	5.1700e-003	3.0000e-005	5.2000e-003	1.3700e-003	3.0000e-005	1.4000e-003	0.0000	3.7693	3.7693	1.0000e-004	0.0000	3.7718
Total	**2.2400e-003**	**0.0135**	**0.0158**	**8.0000e-005**	**6.1400e-003**	**4.0000e-005**	**6.1800e-003**	**1.6500e-003**	**4.0000e-005**	**1.6900e-003**	**0.0000**	**7.6379**	**7.6379**	**4.1000e-004**	**0.0000**	**7.6482**

3.4 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0137	0.1374	0.1626	2.6000e-004		6.4900e-003	6.4900e-003		5.9700e-003	5.9700e-003	0.0000	23.0557	23.0557	7.4600e-003	0.0000	23.2421
Total	**0.0137**	**0.1374**	**0.1626**	**2.6000e-004**		**6.4900e-003**	**6.4900e-003**		**5.9700e-003**	**5.9700e-003**	**0.0000**	**23.0557**	**23.0557**	**7.4600e-003**	**0.0000**	**23.2421**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.3000e-004	0.0122	2.4100e-003	4.0000e-005	9.7000e-004	1.0000e-005	9.8000e-004	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	3.8686	3.8686	3.1000e-004	0.0000	3.8765
Worker	1.9100e-003	1.3600e-003	0.0134	4.0000e-005	5.1700e-003	3.0000e-005	5.2000e-003	1.3700e-003	3.0000e-005	1.4000e-003	0.0000	3.7693	3.7693	1.0000e-004	0.0000	3.7718
Total	**2.2400e-003**	**0.0135**	**0.0158**	**8.0000e-005**	**6.1400e-003**	**4.0000e-005**	**6.1800e-003**	**1.6500e-003**	**4.0000e-005**	**1.6900e-003**	**0.0000**	**7.6379**	**7.6379**	**4.1000e-004**	**0.0000**	**7.6482**

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.4300e-003	0.0392	0.0527	8.0000e-005		1.8200e-003	1.8200e-003		1.7000e-003	1.7000e-003	0.0000	7.0505	7.0505	2.0500e-003	0.0000	7.1018
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.4300e-003**	**0.0392**	**0.0527**	**8.0000e-005**		**1.8200e-003**	**1.8200e-003**		**1.7000e-003**	**1.7000e-003**	**0.0000**	**7.0505**	**7.0505**	**2.0500e-003**	**0.0000**	**7.1018**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	4.4000e-004	4.3700e-003	1.0000e-005	1.6900e-003	1.0000e-005	1.7000e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.2291	1.2291	3.0000e-005	0.0000	1.2299
Total	**6.2000e-004**	**4.4000e-004**	**4.3700e-003**	**1.0000e-005**	**1.6900e-003**	**1.0000e-005**	**1.7000e-003**	**4.5000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.2291**	**1.2291**	**3.0000e-005**	**0.0000**	**1.2299**

3.5 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.4300e-003	0.0392	0.0527	8.0000e-005		1.8200e-003	1.8200e-003		1.7000e-003	1.7000e-003	0.0000	7.0504	7.0504	2.0500e-003	0.0000	7.1018
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.4300e-003**	**0.0392**	**0.0527**	**8.0000e-005**		**1.8200e-003**	**1.8200e-003**		**1.7000e-003**	**1.7000e-003**	**0.0000**	**7.0504**	**7.0504**	**2.0500e-003**	**0.0000**	**7.1018**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	4.4000e-004	4.3700e-003	1.0000e-005	1.6900e-003	1.0000e-005	1.7000e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.2291	1.2291	3.0000e-005	0.0000	1.2299
Total	**6.2000e-004**	**4.4000e-004**	**4.3700e-003**	**1.0000e-005**	**1.6900e-003**	**1.0000e-005**	**1.7000e-003**	**4.5000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.2291**	**1.2291**	**3.0000e-005**	**0.0000**	**1.2299**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2920					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3600e-003	9.1400e-003	0.0136	2.0000e-005		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004	0.0000	1.9149	1.9149	1.1000e-004	0.0000	1.9176
Total	**0.2934**	**9.1400e-003**	**0.0136**	**2.0000e-005**		**4.6000e-004**	**4.6000e-004**		**4.6000e-004**	**4.6000e-004**	**0.0000**	**1.9149**	**1.9149**	**1.1000e-004**	**0.0000**	**1.9176**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.0000e-004	9.7000e-004	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.2731	0.2731	1.0000e-005	0.0000	0.2733
Total	**1.4000e-004**	**1.0000e-004**	**9.7000e-004**	**0.0000**	**3.7000e-004**	**0.0000**	**3.8000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.2731**	**0.2731**	**1.0000e-005**	**0.0000**	**0.2733**

3.6 Architectural Coating - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2920					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3600e-003	9.1400e-003	0.0136	2.0000e-005		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004	0.0000	1.9149	1.9149	1.1000e-004	0.0000	1.9176
Total	**0.2934**	**9.1400e-003**	**0.0136**	**2.0000e-005**		**4.6000e-004**	**4.6000e-004**		**4.6000e-004**	**4.6000e-004**	**0.0000**	**1.9149**	**1.9149**	**1.1000e-004**	**0.0000**	**1.9176**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.0000e-004	9.7000e-004	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.2731	0.2731	1.0000e-005	0.0000	0.2733
Total	**1.4000e-004**	**1.0000e-004**	**9.7000e-004**	**0.0000**	**3.7000e-004**	**0.0000**	**3.8000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.2731**	**0.2731**	**1.0000e-005**	**0.0000**	**0.2733**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Destination Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1772	2.2955	1.8707	0.0117	0.8018	5.8400e-003	0.8076	0.2139	5.4300e-003	0.2193	0.0000	1,091.2735	1,091.2735	0.0877	0.0000	1,093.4658
Unmitigated	0.1805	2.3378	1.9692	0.0124	0.8612	6.2000e-003	0.8674	0.2297	5.7700e-003	0.2355	0.0000	1,152.5852	1,152.5852	0.0884	0.0000	1,154.7954

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Junior College (2Yr)	1,012.20	1,012.20	1012.20	2,277,561	2,120,409
Total	1,012.20	1,012.20	1,012.20	2,277,561	2,120,409

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Junior College (2Yr)	9.30	4.84	47.60	15.70	82.80	1.50	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Junior College (2Yr)	0.655841	0.034949	0.194945	0.000000	0.000000	0.000000	0.000000	0.114265	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	139.5328	139.5328	6.3100e-003	1.3100e-003	140.0795
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	139.5328	139.5328	6.3100e-003	1.3100e-003	140.0795
NaturalGas Mitigated	5.0000e-003	0.0455	0.0382	2.7000e-004		3.4600e-003	3.4600e-003		3.4600e-003	3.4600e-003	0.0000	49.5099	49.5099	9.5000e-004	9.1000e-004	49.8041
NaturalGas Unmitigated	5.0000e-003	0.0455	0.0382	2.7000e-004		3.4600e-003	3.4600e-003		3.4600e-003	3.4600e-003	0.0000	49.5099	49.5099	9.5000e-004	9.1000e-004	49.8041

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Junior College (2Yr)	927780	5.0000e-003	0.0455	0.0382	2.7000e-004		3.4600e-003	3.4600e-003		3.4600e-003	3.4600e-003	0.0000	49.5099	49.5099	9.5000e-004	9.1000e-004	49.8041
Total		**5.0000e-003**	**0.0455**	**0.0382**	**2.7000e-004**		**3.4600e-003**	**3.4600e-003**		**3.4600e-003**	**3.4600e-003**	**0.0000**	**49.5099**	**49.5099**	**9.5000e-004**	**9.1000e-004**	**49.8041**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Junior College (2Yr)	927780	5.0000e-003	0.0455	0.0382	2.7000e-004		3.4600e-003	3.4600e-003		3.4600e-003	3.4600e-003	0.0000	49.5099	49.5099	9.5000e-004	9.1000e-004	49.8041
Total		**5.0000e-003**	**0.0455**	**0.0382**	**2.7000e-004**		**3.4600e-003**	**3.4600e-003**		**3.4600e-003**	**3.4600e-003**	**0.0000**	**49.5099**	**49.5099**	**9.5000e-004**	**9.1000e-004**	**49.8041**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Junior College (2Yr)	479640	139.5328	6.3100e-003	1.3100e-003	140.0795
Total		**139.5328**	**6.3100e-003**	**1.3100e-003**	**140.0795**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Junior College (2Yr)	479640	139.5328	6.3100e-003	1.3100e-003	140.0795
Total		**139.5328**	**6.3100e-003**	**1.3100e-003**	**140.0795**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1933	0.0000	3.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.4000e-004	7.4000e-004	0.0000	0.0000	7.9000e-004
Unmitigated	0.1933	0.0000	3.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.0000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0292					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1640					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.0000e-005	0.0000	3.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.0000e-004
Total	**0.1933**	**0.0000**	**3.9000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**7.5000e-004**	**7.5000e-004**	**0.0000**	**0.0000**	**8.0000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0292					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1640					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	3.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	7.4000e-004	7.4000e-004	0.0000	0.0000	7.9000e-004
Total	**0.1933**	**0.0000**	**3.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**7.4000e-004**	**7.4000e-004**	**0.0000**	**0.0000**	**7.9000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	7.1771	0.0674	1.6500e-003	9.3532
Unmitigated	7.1771	0.0674	1.6500e-003	9.3532

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Junior College (2Yr)	2.06006 / 3.22214	7.1771	0.0674	1.6500e-003	9.3532
Total		**7.1771**	**0.0674**	**1.6500e-003**	**9.3532**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Junior College (2Yr)	2.06006 / 3.22214	7.1771	0.0674	1.6500e-003	9.3532
Total		**7.1771**	**0.0674**	**1.6500e-003**	**9.3532**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	11.0833	0.6550	0.0000	27.4584
Unmitigated	11.0833	0.6550	0.0000	27.4584

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Junior College (2Yr)	54.6	11.0833	0.6550	0.0000	27.4584
Total		**11.0833**	**0.6550**	**0.0000**	**27.4584**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Junior College (2Yr)	54.6	11.0833	0.6550	0.0000	27.4584
Total		**11.0833**	**0.6550**	**0.0000**	**27.4584**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Project: West Hills CCD Lemoore SPAL
Land Use Subtype: Junior College (2-year)

Key

Data from CalEEMod or client	value
Data entered in CalEEMod	value

Weekly Trips

Weekday Trip Rate[1] (trips/size unit)	Saturday Trip Rate[1] (trips/size unit)	Sunday Trip Rate[1] (trips/size unit)	# of Size Unit	Total Weekly[2] Trips	Total Annual Trips
24.10	24.10	24.10	42	7,084	368,368

1.Weekly trip rate provided by traffic engineer.

2. Total Weekly Trips = [(Trip Rate$_{weekday}$ x 5) + Trip Rate$_{Saturday}$ + Trip Rate$_{Sunday}$] * Land Use$_i$

Average Trip Length

Trip Length (miles)[1]			Trip Purpose[2]			Trip Percentage[3]		
C-C	C-W	C-NW	Primary	Diverted	Passby	C-C	C-W	C-NW
4.84	9.30	47.6	100%	0%	0%	82.8%	15.7%	1.5%

1. C-C represents average trip length for students, C-W represents average trip length for staff/faculty, C-NW represents average trip length for HHD trips, provided by traffic engineer.
2. Trip purpose assumed to be 100% primary trips.
3. Trip percentage breakdown based on number of each trip type provided by traffic engineer.

Annual VMT

Annual Trips by Type			Average Trip Length[1]			Annual VMT[2]			Total Annual VMT
C-C	C-W	C-NW	C-C	C-W	C-NW	C-C	C-W	C-NW	
305,032	57,876	5,460	4.84	9.30	47.60	1,476,355	538,247	259,896	2,274,498

1. Average Trip Length$_{i,m}$ = (Link %$_{primary}$ x Trip Length$_{primary}$) + (Link %$_{diverted}$ x 0.25 x Trip Length$_{primary}$) + (Link %$_{passby}$ x 0.1 miles)
2. VMT = (Number of Trips x Average Trip Length)

Default Vehicle Fleet Mix

Category	Vehicle Type													
	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH	Total
Default Fleet Mix	0.508492	0.027097	0.151146	0.105962	0.015839	0.00408	0.011483	0.165636	0.001689	0.001606	0.005452	0.000904	0.000613	0.999999
Annual VMT by Vehicle Type	1,156,564	61,632	343,781	241,010	36,026	9,280	26,118	376,739	3,842	3,653	12,401	2,056	1,394	2,274,495

Heavy Heavy Duty (HHD) VMT Adjustment

Weekly Trips [1]	Trip Length (miles)[2]	Total Annual Trips	Total Annual VMT	Annual VMT to Adjust
105	47.60	5,460	259,896	116,843

1. HHD weekly trips provided by developer.
2. C-NW trip length based on HHD trip length provided by traffic engineer.

VMT Adjustment

Annual VMT to Adjust[1]
452,622

1. HHD VMT to Adjust plus MDV, LHD1, LHD2, MHD, OBUS, UBUS, MCY, SBUS, MH VMTs

Fleet Mix Adjustment

Category	Vehicle Type			
	LDA	LDT1	LDT2	Total
Default Annual VMT	1,156,564	61,632	343,781	1,561,977
Additional VMT	335,144	17,859	99,619	452,622
Total VMT	1,491,707	79,492	443,400	2,014,599

Adjusted Fleet Mix - non-HHD

Category	Vehicle Type													
	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH	Total
Annual VMT by Vehicle Type	1,491,707	79,492	443,400	0	0	0	0	259,896	0	0	0	0	0	2,274,495
Fleet Mix	0.655841	0.034949	0.194945	0.000000	0.000000	0.000000	0.000000	0.114265	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000

West Hills CCD Lemoore - BAU

Kings County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Junior College (2Yr)	42.00	1000sqft	0.96	42,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	37
Climate Zone	3			**Operational Year**	2005
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	PhaseEndDate	6/23/2004	6/9/2004
tblConstructionPhase	PhaseEndDate	6/9/2004	5/26/2004
tblConstructionPhase	PhaseEndDate	1/21/2004	1/7/2004
tblConstructionPhase	PhaseEndDate	6/16/2004	6/2/2004
tblConstructionPhase	PhaseEndDate	1/19/2004	1/5/2004
tblConstructionPhase	PhaseStartDate	6/17/2004	6/3/2004
tblConstructionPhase	PhaseStartDate	1/22/2004	1/8/2004
tblConstructionPhase	PhaseStartDate	1/20/2004	1/6/2004
tblConstructionPhase	PhaseStartDate	6/10/2004	5/27/2004
tblConstructionPhase	PhaseStartDate	1/17/2004	1/5/2004
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2004											0.0000	86.9835	86.9835	0.0218	0.0000	87.5293
Maximum											**0.0000**	**86.9835**	**86.9835**	**0.0218**	**0.0000**	**87.5293**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2004											0.0000	86.9834	86.9834	0.0218	0.0000	87.5293
Maximum											**0.0000**	**86.9834**	**86.9834**	**0.0218**	**0.0000**	**87.5293**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.4000e-004
Energy											0.0000	189.0427	189.0427	7.2600e-003	2.2100e-003	189.8836
Mobile											0.0000	1,721.2687	1,721.2687	0.7143	0.0000	1,739.1252
Waste											11.0833	0.0000	11.0833	0.6550	0.0000	27.4584
Water											0.6536	6.5235	7.1771	0.0674	1.6500e-003	9.3532
Total											**11.7369**	**1,916.8357**	**1,928.5725**	**1.4439**	**3.8600e-003**	**1,965.8212**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.4000e-004
Energy											0.0000	189.0427	189.0427	7.2600e-003	2.2100e-003	189.8836
Mobile											0.0000	1,721.2687	1,721.2687	0.7143	0.0000	1,739.1252
Waste											11.0833	0.0000	11.0833	0.6550	0.0000	27.4584
Water											0.6536	6.5235	7.1771	0.0674	1.6500e-003	9.3532
Total											**11.7369**	**1,916.8357**	**1,928.5725**	**1.4439**	**3.8600e-003**	**1,965.8212**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/5/2004	1/5/2004	5	1	
2	Grading	Grading	1/6/2004	1/7/2004	5	2	
3	Building Construction	Building Construction	1/8/2004	5/26/2004	5	100	
4	Paving	Paving	5/27/2004	6/2/2004	5	5	
5	Architectural Coating	Architectural Coating	6/3/2004	6/9/2004	5	5	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 63,000; Non-Residential Outdoor: 21,000; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	2	5.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	18.00	7.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2004

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	0.5117	0.5117	1.0000e-004	0.0000	0.5143
Total											**0.0000**	**0.5117**	**0.5117**	**1.0000e-004**	**0.0000**	**0.5143**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.0327	0.0327	1.0000e-005	0.0000	0.0328
Total											**0.0000**	**0.0327**	**0.0327**	**1.0000e-005**	**0.0000**	**0.0328**

3.2 Site Preparation - 2004

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	0.5117	0.5117	1.0000e-004	0.0000	0.5143
Total											**0.0000**	**0.5117**	**0.5117**	**1.0000e-004**	**0.0000**	**0.5143**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.0327	0.0327	1.0000e-005	0.0000	0.0328
Total											**0.0000**	**0.0327**	**0.0327**	**1.0000e-005**	**0.0000**	**0.0328**

3.3 Grading - 2004

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	1.1395	1.1395	3.0000e-004	0.0000	1.1469
Total											**0.0000**	**1.1395**	**1.1395**	**3.0000e-004**	**0.0000**	**1.1469**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.1308	0.1308	2.0000e-005	0.0000	0.1314
Total											**0.0000**	**0.1308**	**0.1308**	**2.0000e-005**	**0.0000**	**0.1314**

3.3 Grading - 2004

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	1.1395	1.1395	3.0000e-004	0.0000	1.1469
Total											**0.0000**	**1.1395**	**1.1395**	**3.0000e-004**	**0.0000**	**1.1469**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.1308	0.1308	2.0000e-005	0.0000	0.1314
Total											**0.0000**	**0.1308**	**0.1308**	**2.0000e-005**	**0.0000**	**0.1314**

3.4 Building Construction - 2004

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	60.0010	60.0010	0.0150	0.0000	60.3765
Total											**0.0000**	**60.0010**	**60.0010**	**0.0150**	**0.0000**	**60.3765**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	9.2908	9.2908	3.3500e-003	0.0000	9.3745
Worker											0.0000	11.7711	11.7711	2.0500e-003	0.0000	11.8223
Total											**0.0000**	**21.0619**	**21.0619**	**5.4000e-003**	**0.0000**	**21.1968**

3.4 Building Construction - 2004

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	60.0009	60.0009	0.0150	0.0000	60.3764
Total											**0.0000**	**60.0009**	**60.0009**	**0.0150**	**0.0000**	**60.3764**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	9.2908	9.2908	3.3500e-003	0.0000	9.3745
Worker											0.0000	11.7711	11.7711	2.0500e-003	0.0000	11.8223
Total											**0.0000**	**21.0619**	**21.0619**	**5.4000e-003**	**0.0000**	**21.1968**

3.5 Paving - 2004

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	2.7483	2.7483	6.9000e-004	0.0000	2.7654
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**2.7483**	**2.7483**	**6.9000e-004**	**0.0000**	**2.7654**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.5886	0.5886	1.0000e-004	0.0000	0.5911
Total											**0.0000**	**0.5886**	**0.5886**	**1.0000e-004**	**0.0000**	**0.5911**

3.5 Paving - 2004

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road											0.0000	2.7483	2.7483	6.9000e-004	0.0000	2.7654
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**2.7483**	**2.7483**	**6.9000e-004**	**0.0000**	**2.7654**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.5886	0.5886	1.0000e-004	0.0000	0.5911
Total											**0.0000**	**0.5886**	**0.5886**	**1.0000e-004**	**0.0000**	**0.5911**

3.6 Architectural Coating - 2004

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	0.6383	0.6383	1.8000e-004	0.0000	0.6428
Total											**0.0000**	**0.6383**	**0.6383**	**1.8000e-004**	**0.0000**	**0.6428**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.1308	0.1308	2.0000e-005	0.0000	0.1314
Total											**0.0000**	**0.1308**	**0.1308**	**2.0000e-005**	**0.0000**	**0.1314**

3.6 Architectural Coating - 2004

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	0.6383	0.6383	1.8000e-004	0.0000	0.6428
Total											**0.0000**	**0.6383**	**0.6383**	**1.8000e-004**	**0.0000**	**0.6428**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.1308	0.1308	2.0000e-005	0.0000	0.1314
Total											**0.0000**	**0.1308**	**0.1308**	**2.0000e-005**	**0.0000**	**0.1314**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	1,721.2687	1,721.2687	0.7143	0.0000	1,739.1252
Unmitigated											0.0000	1,721.2687	1,721.2687	0.7143	0.0000	1,739.1252

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Junior College (2Yr)	1,154.58	471.66	50.82	2,184,963	2,184,963
Total	1,154.58	471.66	50.82	2,184,963	2,184,963

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Junior College (2Yr)	14.70	6.60	6.60	6.40	88.60	5.00	92	7	1

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Junior College (2Yr)	0.404531	0.053546	0.132256	0.184203	0.044106	0.005671	0.014637	0.148129	0.001331	0.002758	0.005848	0.001227	0.001758

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	139.5328	139.5328	6.3100e-003	1.3100e-003	140.0795
Electricity Unmitigated											0.0000	139.5328	139.5328	6.3100e-003	1.3100e-003	140.0795
NaturalGas Mitigated											0.0000	49.5099	49.5099	9.5000e-004	9.1000e-004	49.8041
NaturalGas Unmitigated											0.0000	49.5099	49.5099	9.5000e-004	9.1000e-004	49.8041

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Junior College (2Yr)	927780											0.0000	49.5099	49.5099	9.5000e-004	9.1000e-004	49.8041
Total												**0.0000**	**49.5099**	**49.5099**	**9.5000e-004**	**9.1000e-004**	**49.8041**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Junior College (2Yr)	927780											0.0000	49.5099	49.5099	9.5000e-004	9.1000e-004	49.8041
Total												**0.0000**	**49.5099**	**49.5099**	**9.5000e-004**	**9.1000e-004**	**49.8041**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Junior College (2Yr)	479640	139.5328	6.3100e-003	1.3100e-003	140.0795
Total		**139.5328**	**6.3100e-003**	**1.3100e-003**	**140.0795**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Junior College (2Yr)	479640	139.5328	6.3100e-003	1.3100e-003	140.0795
Total		**139.5328**	**6.3100e-003**	**1.3100e-003**	**140.0795**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.4000e-004
Unmitigated											0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.4000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.4000e-004
Total											**0.0000**	**7.5000e-004**	**7.5000e-004**	**0.0000**	**0.0000**	**8.4000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	7.5000e-004	7.5000e-004	0.0000	0.0000	8.4000e-004
Total											**0.0000**	**7.5000e-004**	**7.5000e-004**	**0.0000**	**0.0000**	**8.4000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	7.1771	0.0674	1.6500e-003	9.3532
Unmitigated	7.1771	0.0674	1.6500e-003	9.3532

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Junior College (2Yr)	2.06006 / 3.22214	7.1771	0.0674	1.6500e-003	9.3532
Total		**7.1771**	**0.0674**	**1.6500e-003**	**9.3532**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Junior College (2Yr)	2.06006 / 3.22214	7.1771	0.0674	1.6500e-003	9.3532
Total		**7.1771**	**0.0674**	**1.6500e-003**	**9.3532**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	11.0833	0.6550	0.0000	27.4584
Unmitigated	11.0833	0.6550	0.0000	27.4584

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Junior College (2Yr)	54.6	11.0833	0.6550	0.0000	27.4584
Total		**11.0833**	**0.6550**	**0.0000**	**27.4584**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Junior College (2Yr)	54.6	11.0833	0.6550	0.0000	27.4584
Total		**11.0833**	**0.6550**	**0.0000**	**27.4584**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B. TOXIC EMISSIONS AND PRIORITIZATION

West Hills CCD Lemoore SPAL

HHD Diesel Particulate Matter

Based on:

Trips/Year:	5,475	(15 trips per day x 365 days/year)
Miles/Trip:	0.5	(on-site distance for HHD trucks)
Miles/Year:	2,738	

	PM10[1]
Em. Factor (grams/mile)	1.32E-02
Lbs/Mile	2.91E-05
Lbs/Year[2]	0.0797

1. EMFAC PM10 emission factor for 2024 T7 Single vehicle category.
2. Assume total DPM is equivalent to total PM10.

Max Prioritization
for
CEQA West Hills CCD (C-1)

Grouped Facilities: None

Area Name: No Sub-Areas Identified

Receptor: Stack Table Distance

Options Selected:
☐ 2,500 m Distance Limit
☐ Remove Pollutants < 1/2 the Applicable Degree of Accuracy

Toxic Device #: 1
Device Name: HHD Trucks
Receptor Distance (m): 0
Greater Than 2500m ☐

					Emissions and Potency Method Prioritization Scores			Dispersion Adjustment Method Prioritization Scores		
CAS NUMBER	POLLUTANT NAME	PROID	LBS/YEAR	LBS/HOUR	CANCER	CHRONIC	ACUTE	CANCER	CHRONIC	ACUTE
9901	Diesel engine exhaust, particulate matt	1	7.97E-02	0.00E+00	1.84E-01	2.73E-04		3.06E-03	4.55E-06	
				TOTALS FOR DEVICE 1	1.84E-01	2.73E-04		3.06E-03	4.55E-06	
				Total For Area:	1.84E-01	2.73E-04		3.06E-03	4.55E-06	

Emissions and Potency Method

Prioritization Scores

CANCER	CHRONIC	ACUTE
1.84E-01	2.73E-04	

TS = Total Score
t = Specific Toxic Substance
EYR = Emissions in lbs / year
EHR = Emissions in Maximum lbs / hour for Acute and Average lbs / hour for Chronic
NF = Normalization Factor (Cancer = 7700, Acute = 1500, Chronic = 150)
URF = Unit Risk Factor
AREL = Acute Reference Exposure Level
CREL = Chronic Reference Exposure Level
RP = Receptor Proximity Adjustment Factor
R = Receptor Distance

R	RP
0m < R < 100m	1.0
100m < R < 250m	0.25
250m < R < 500m	0.04
500m < R < 1000m	0.011
1000m < R < 1500m	0.003
1500m < R < 2000m	0.002
R > 2000m	0.001

Cancer Score:
TS(t) = EYR(t) * URF(t) * RP * 7700

Acute Score:
TS(t) = [EHR(t) / AREL(t)] * RP * 1500

Chronic Score:
TS(t) = [EYR(t) / CREL(t)] * RP * 150

Dispersion Adjustment Method

Prioritization Scores

CANCER	CHRONIC	ACUTE
3.06E-03	4.55E-06	

TS = Total Score
t = Specific Toxic Substance
EYR = Emissions in lbs / year
EHR = Emissions in Maximum lbs / hour for Acute and Average lbs / hour for Chronic
NF = Normalization Factor (Cancer = 128, Acute = 25, Chronic = 2.5)
URF = Unit Risk Factor
AREL = Acute Reference Exposure Level
CREL = Chronic Reference Exposure Level
SHA = Stack Height Adjustment (< 20m = 60, < 45m = 9, >= 45m = 1)
RP = Receptor Proximity Adjustment Factor
R = Receptor Distance
H = Stack Height

For Stacks 0m <= H < 20m		For Stacks 20m <= H < 45m		For Stacks - >= H < 45m	
R	RP	R	RP	R	RP
0m < R < 100m	1.0	0m < R < 100m	1.0	0m < R < 100m	1.0
100m < R < 250m	0.25	100m < R < 250m	0.85	100m < R < 250m	1.0
250m < R < 500m	0.04	250m < R < 500m	0.22	250m < R < 500m	0.90
500m < R < 1000m	0.011	500m < R < 1000m	0.064	500m < R < 1000m	0.40
1000m < R < 1500m	0.003	1000m < R < 1500m	0.018	1000m < R < 1500m	0.13
1500m < R < 2000m	0.002	1500m < R < 2000m	0.009	1500m < R < 2000m	0.066
R > 2000m	0.001	R > 2000m	0.006	R > 2000m	0.042

Cancer Score:
TS(t) = EYR(t) * URF(t) * RP * SHA * 128

Acute Score:
TS(t) = [EHR(t) / AREL(t)] * RP * SHA * 25

Chronic Score:
TS(t) = [EYR(t) / CREL(t)] * RP * 150 * SHA * 2.5}

APPENDIX B

CULTURAL MEMORANDUM

TECHNICAL MEMORANDUM

Date: December 7, 2020

Project: Cultural resources records search- West Hills Community College Lemoore Campus Institutional Center Project, City of Lemoore, Kings County, CA (200400)

To: Jaymie Brauer, Principal Planner

From: Robert Parr, MS, RPA, Senior Archaeologist

Subject: Cultural Resources Records Search Results (RS#20- 429)

Background

This cultural resources records search (RS #20-429) was conducted at the Southern San Joaquin Valley Information Center, CSU Bakersfield for the above referenced Project in the City of Lemoore, Kings County to determine whether any known cultural resources were located on or near the proposed project that might be impacted by project development and activities.

Location

The Project located on Bush St and College Ave and is within Section 8, T19S R20E, MDB&M and in the Lemoore USGS quadrangle (Figures 1-4).

Project Description

The West Hills Community College District is proposing to construct a 42,000 square foot, 2 story Instructional Center (IC) on an undeveloped but disturbed portion of the existing campus. The proposed expansion is anticipated to increase the overall student population by approximately 5 percent. The IC will be used to expand education opportunities in the areas of allied health services, computer science and graphic arts.

Results

The records search covered an area within one-half mile of the Project and included a review of the *National Register of Historic Places, California Points of Historical Interest, California Registry of Historic Resources, California Historical Landmarks, California State Historic Resources Inventory*, and a review of cultural resource reports on file.

The records search indicated that the subject property had never been surveyed for cultural resources and it is not known if any exist there.

Five cultural resource studies have been conducted within a half mile of the property (Hatoff et al. 1995; Love and Tang 2002a, 2002b; Varner 2003; Girado and Orfila 2009). Only one cultural resource, a segment of the historic route of the Southern Pacific Railroad (now the San Joaquin Valley Railroad) (P-16-000122), has been identified within a half mile of the proposed project. However, the Project will not impact this resource.

A Sacred Lands File request was also submitted to the Native American Heritage Commission. A response dated December 18, 2020 indicates negative results (see Attachment B).

Conclusions

Based on the results of cultural records search findings and the lack of archaeological resources previously identified within a half mile radius of the proposed Project, the potential to encounter subsurface cultural resources is minimal. Additionally, the Project construction would be conducted within the developed and previously disturbed roadways and road easements. The potential to uncover subsurface historical or archaeological deposits is would be considered unlikely.

However, there is still a possibility that historical or archaeological materials may be exposed during construction. Grading and trenching, as well as other ground-disturbing actions have the potential to damage or destroy these previously unidentified and potentially significant cultural resources within the project area, including historical or archaeological resources. Disturbance of any deposits that have the potential to provide significant cultural data would be considered a significant impact. To reduce the potential impacts of the Project on cultural resources, the following measures are recommended. With implementation of CUL-1 and CUL-2, the Project would have a less than significant impact related to cultural resources.

CUL-1: If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from Project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. Implementation of the mitigation measure below would ensure that the proposed Project would not cause a substantial adverse change in the significance of a historical resource.

CUL-2: If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code. The specific protocol, guidelines, and channels of communication outlined by the Native American Heritage Commission, in accordance with Section 7050.5 of the Health and Safety Code, Section 5097.98 of the Public Resources Code (Chapter 1492, Statutes of 1982, Senate Bill 297), and Senate Bill 447 (Chapter 44, Statutes of 1987), shall be followed. Section 7050.5(c) shall guide the potential Native American involvement, in the event of discovery of human remains, at the direction of the county coroner.

(s) Robert E. Parr, MS, RPA
Senior Archaeologist

Attachment A- Figures
Attachment B- Sacred Lands File Response by the Native American Heritage Commission

References

(all reports on file at the Southern San Joaquin Valley Information Center, California State University, Bakersfield)

Girado, Amy and Rebecca S. Orfila
2009 A Cultural Resources Assessment of Approximately 70 Acres of Land for the City Lemoore Arsenic Mitigation Program, Kings County, California. (KI-00191)

Hatoff, Brian, Barb Voss, Sharon Waechter, Vance Benté, and Stephen Wee
1995 Cultural Resources Inventory Report for the Proposed Mojave Northward Expansion Project. (KI-00028)

Love, Bruce and Bai "Tom" Tang
2002a Archaeological Survey Report: Cross Valley Rail Corridor Project Between the Cities of Visalia and Huron, Tulare, Kings, and Fresno Counties, California. (KI-00110).

2002b Historic Study Report/Historical Resources Evaluation Report: Cross Valley Rail Corridor Project Between the Cities of Visalia and Huron, Tulare, Kings, and Fresno Counties, California. (KI-00111)

Varner, Dudley M.
2003 A Cultural Resource Study for the Tachi Yokuts Cultural Center Project, West Hills Community College Districy, Lemoore Campus, Kings County, California. (KI-00140)

ATTACHMENT A
PROJECT FIGURES

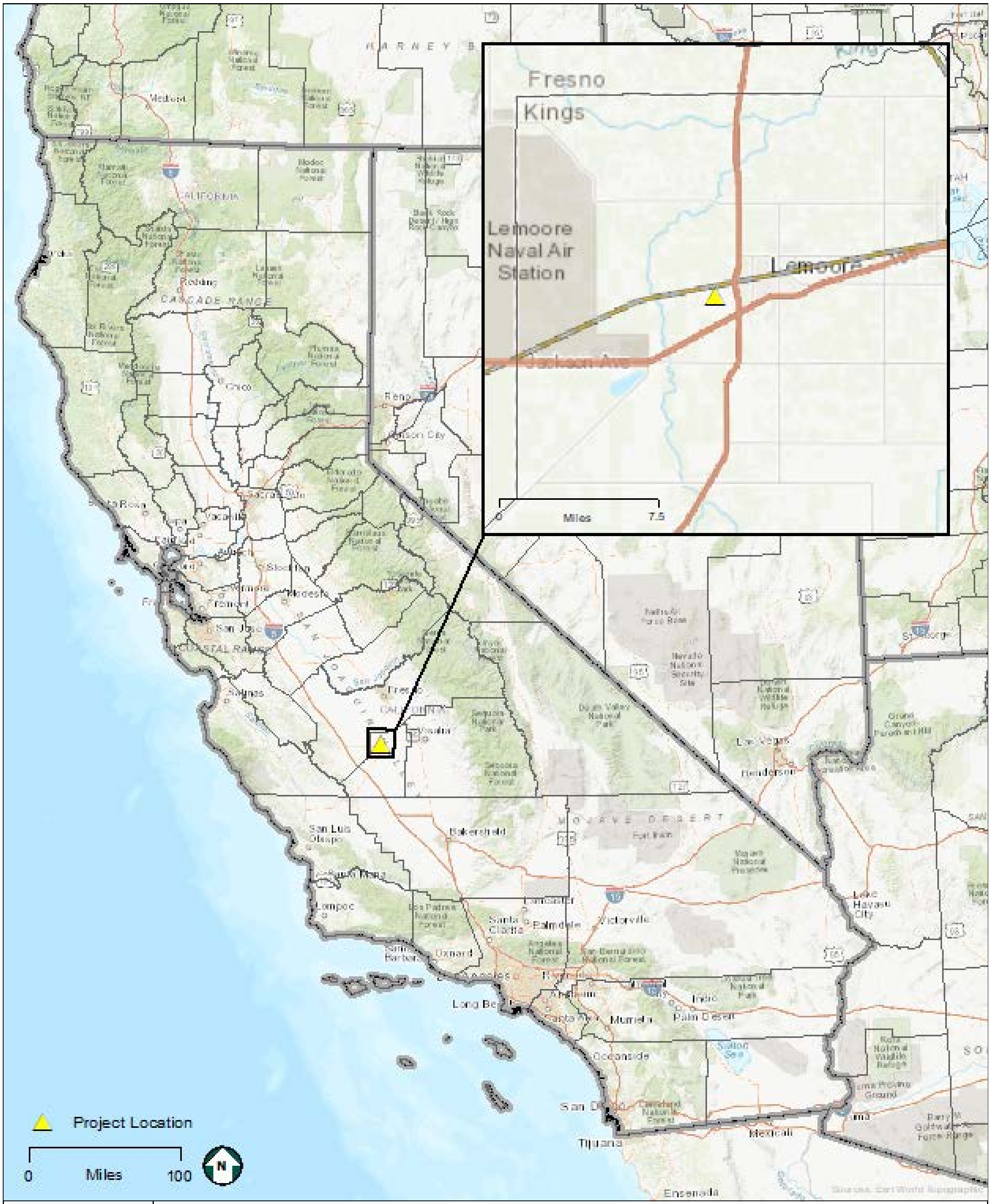


Figure - 1
Regional Location

Figure - 2
Project Area

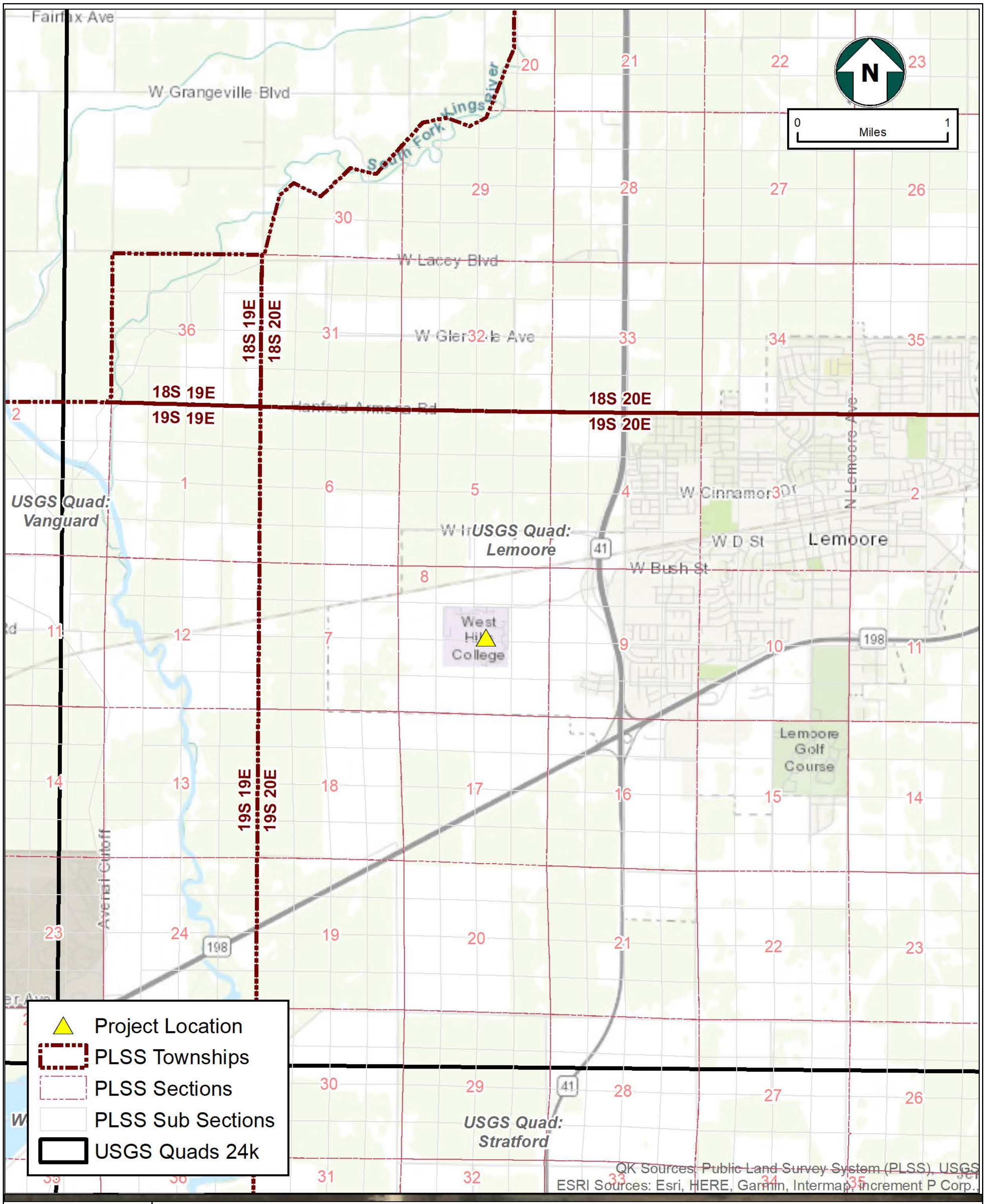
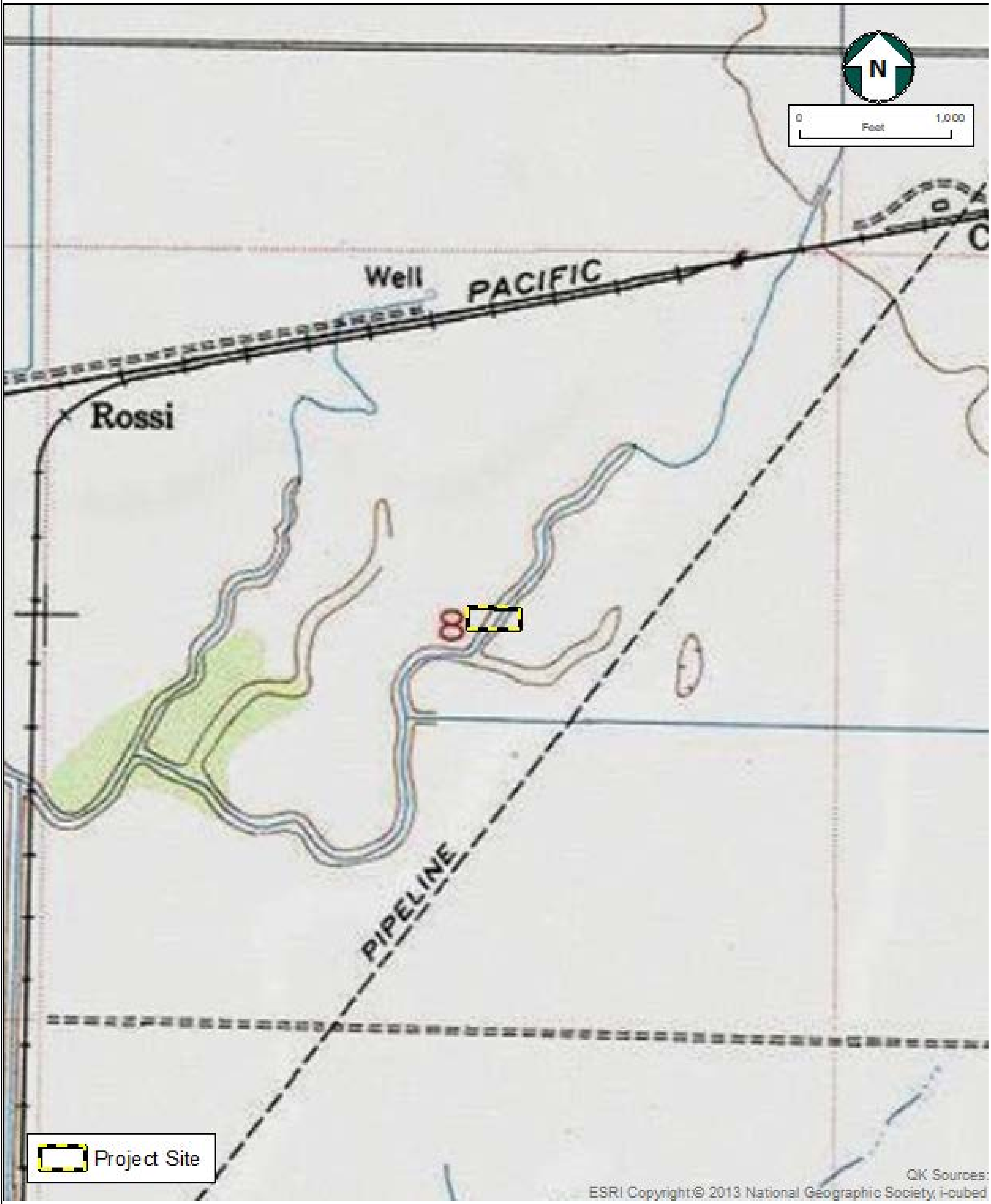


Figure - 3
PLSS/USGS Quad



QK Sources:
ESRI Copyright© 2013 National Geographic Society, i-cubed

Figure - 4
Topo

Attachment B-
Sacred Lands File Response by the Native American Heritage Commission

STATE OF CALIFORNIA Gavin Newsom, *Governor*

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

December 18, 2020

Jaymie Brauer
Quad Knopf, Inc.

Via Email to: jaymie.brauer@qkinc.com

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, West Hills Community College District Leemore Campus Construction Project, Kings County

Dear Ms. Brauer:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measures.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions, please contact me at my email address: Nancy.Gonzalez-Lopez@nahc.ca.gov.

Sincerely,

Nancy Gonzalez-Lopez

Nancy Gonzalez-Lopez
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Tribal Consultation List
December 18, 2020

Kings River Choinumni Farm Tribe
Stan Alec
3515 East Fedora Avenue Foothill Yokuts
Fresno , CA 93726 Choinumni
(559) 647-3227 Cell

Santa Rosa Rancheria Tachi Yokut Tribe
Leo Sisco. Chairperson
P.O. Box 8 Tache
Lemoore , CA 93245 Tachi
Yokut
(559) 924-1278

Table Mountain Rancheria
Brenda D. Lavell. Chairperson
P.O. Box 410 Yokuts
Friant , CA 93626
rpennell@tmr.org
(559) 822-2587

Table Mountain Rancheria
Bob Pennell. Cultural Resources Director
P.O. Box 410 Yokuts
Friant , CA 93626
rpennell@tmr.org
(559) 325-0351
(559) 217-9718 - cell

Tule River Indian Tribe
Neil Peyron. Chairperson
P.O. Box 589 Yokuts
Porterville , CA 93258
neil.peyron@tulerivertribe-nsn.gov
(559) 781-4271

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow. Chairperson
1179 Rock Haven Ct. Foothill Yokuts
Salinas , CA 93906 Mono
kwood8934@aol.com Wuksache
(831) 443-9702

This list is current only as of the date of this document and is based on the information available to the Commission on the date it was produced. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list applicable only for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed:
West Hills Community College District Leemore Campus Construction Project, Kings County.

WEST HILLS
COMMUNITY COLLEGE DISTRICT

December 10, 2020

FROM: West Hills Community College District

RE: Tribal Cultural Resources under the California Environmental Quality Act, AB 52 (Gatto, 2014). A Formal Notification of a Decision to Undertake a Project and Notification of Consultation Opportunity, pursuant to Public Resources Code § 21080.3.1 (hereafter PRC).

Dear Chairperson:

The West Hills Community College District (District) has decided to undertake the West Hills- Lemoore Campus Construction Project (Project) in the City of Lemoore, California. The District is designated as Lead Agency under the California Environmental Quality Act (CEQA).

The project site is located on the West Hills Community College- Lemoore campus on the northwest corner of Pederson Avenue and College Avenue in the City of Lemoore, Kings County, CA. The project site is within a portion of Assessor's Parcel Numbers 023-510-018, which totals approximately 27.1 acres in area, Section 8, Township 19S, Range 20E, MMB&M.

The District is proposing to construct a 42,000 square foot, two-story Instructional Center (IC) and ancillary parking on an undeveloped but disturbed portion of the existing Lemoore campus. Figure 1 shows the regional location and Figure 2 shows the Project's aerial location. Figure 3 shows the PLSS/USGS quadrangle and Figure 4 shows the topography of the site.

No new construction would occur outside of the existing campus footprint. The College has a current student enrollment of 4,600 students and the proposed expansion is anticipated to increase the overall student population by approximately 5 percent or approximately 232 students. The IC will be used to expand education opportunities in the areas of allied health services, computer science and graphic arts.

Pursuant to PRC § 21080.3.1 (b), you have 30 days from the receipt of this letter to request consultation, in writing, with the West Hills Community College District.

Should you have any comments or questions please contact our designated representative, Jaymie L. Brauer at (661) 616-2600 or at jaymie.brauer@QKinc.com.

Very Respectfully,

Richard Storti

Richard Storti
Deputy Chancellor- Business Services

Enclosures: Figures 1-4

ATTACHMENT A
PROJECT FIGURES

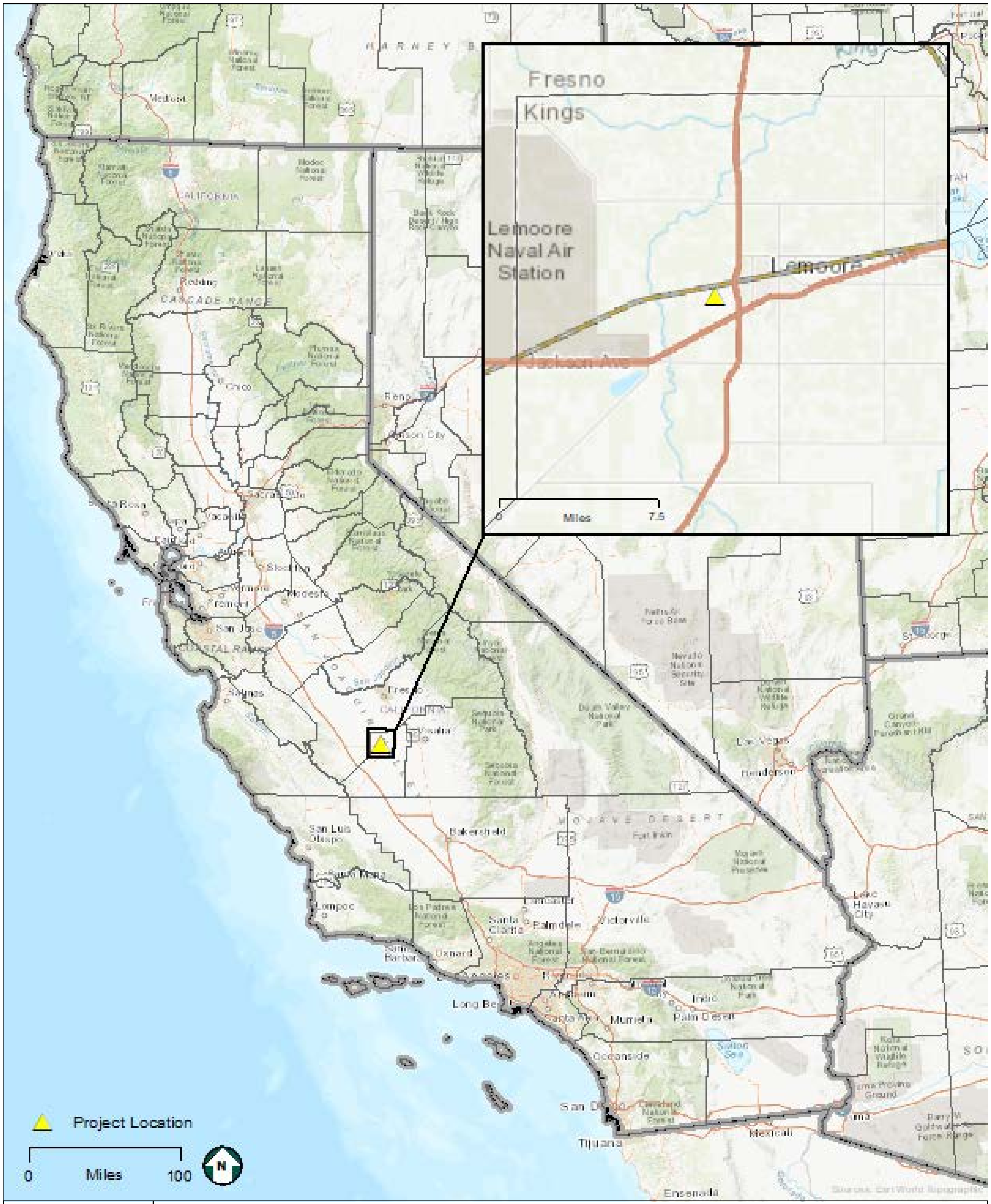
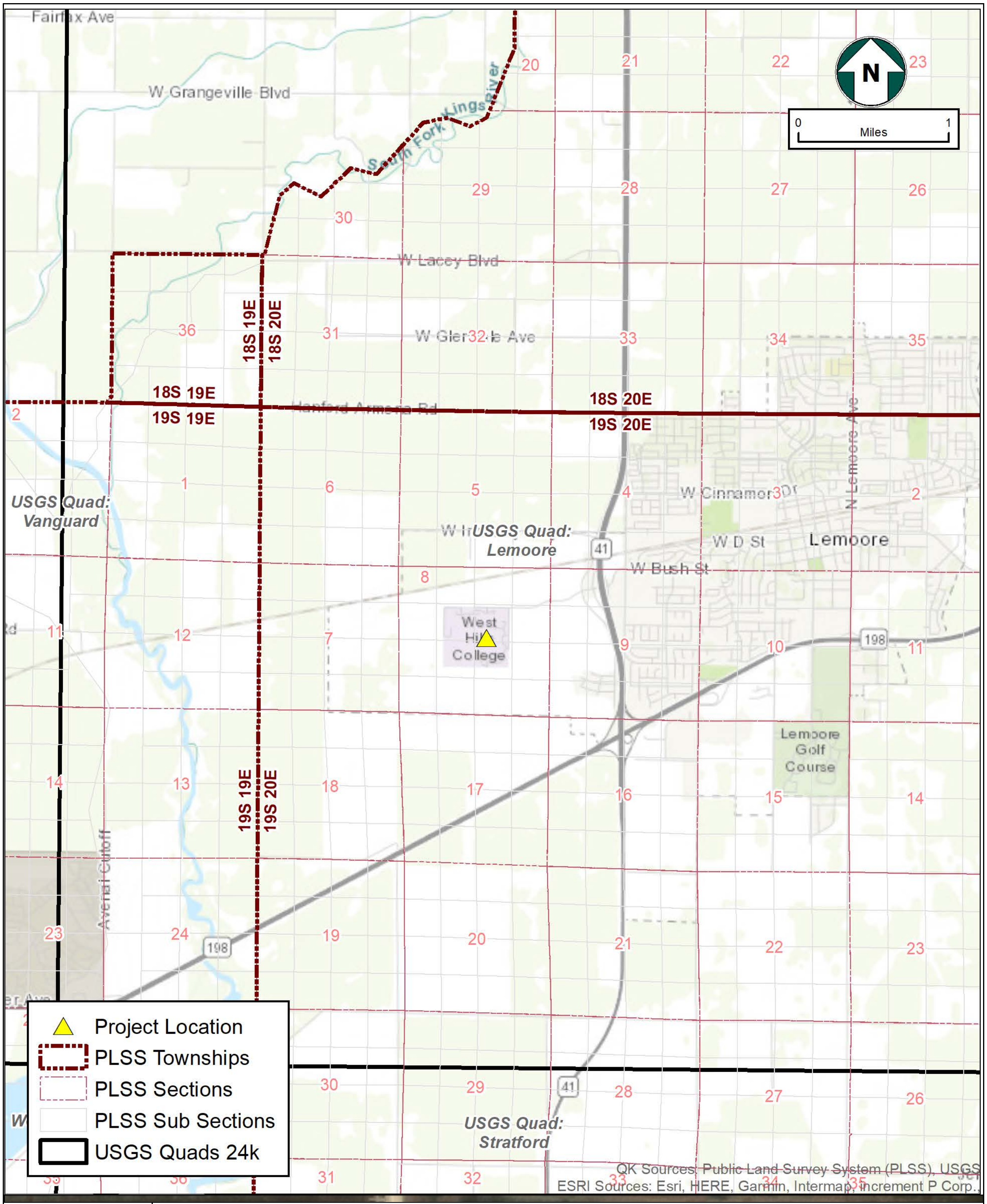


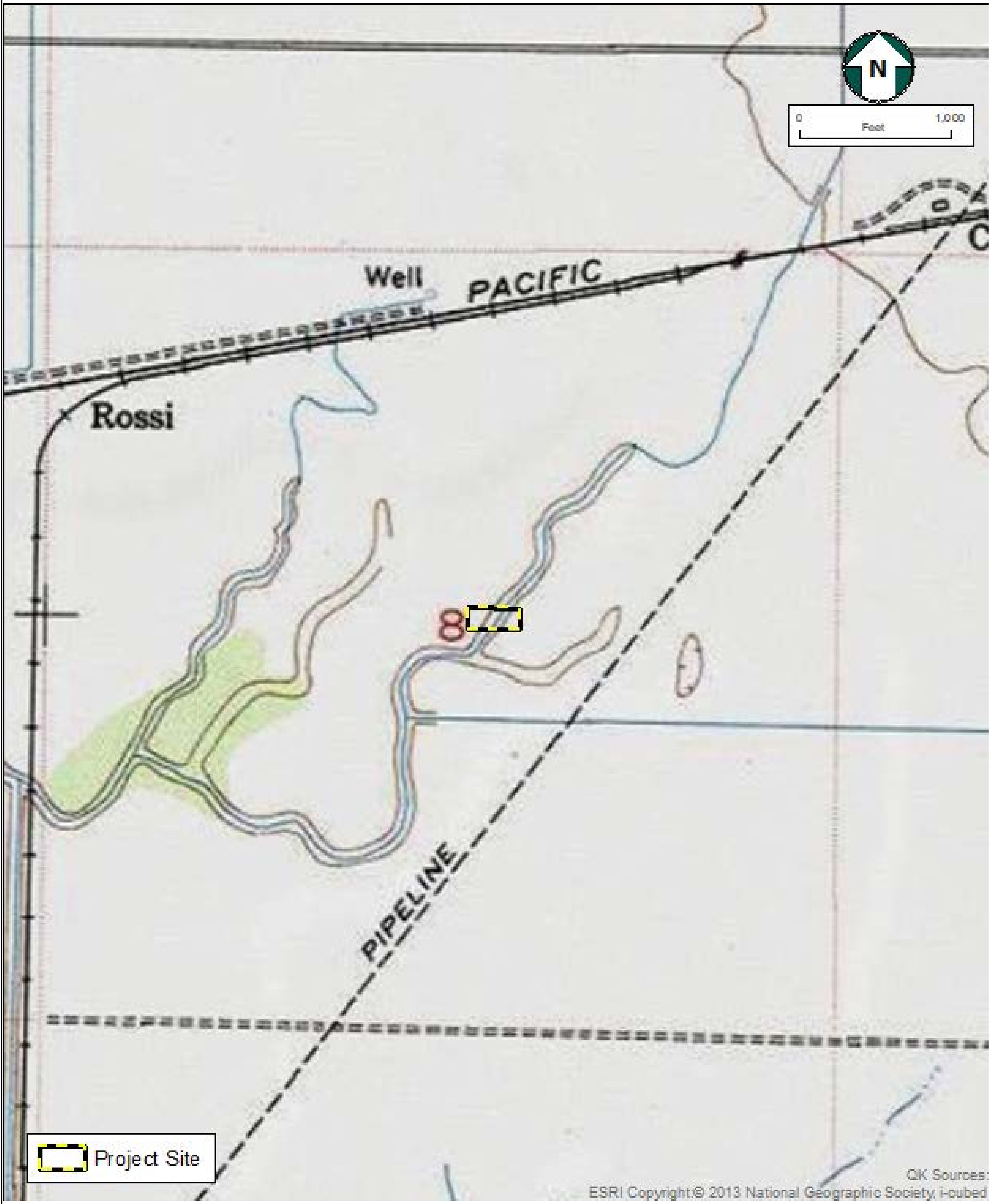
Figure - 1
Regional Location

Figure - 2
Project Area



QK Sources: Public Land Survey System (PLSS), USGS
ESRI Sources: Esri, HERE, Garmin, Intermap, increment P Corp.

Figure - 3
PLSS/USGS Quad



QK Sources:
ESRI Copyright:© 2013 National Geographic Society, i-cubed

Figure - 4
Topo

APPENDIX C

GEOTECHNICAL REPORT

GEOTECHNICAL ENGINEERING INVESTIGATION REPORT AND GEOLOGIC AND SEISMIC HAZARDS EVALUATION PROPOSED STUDENT CENTER WEST HILLS COLLEGE, LEMOORE LEMOORE, CALIFORNIA

BSK G11-003-11B

Prepared for:

AP Architects, Inc.
3434 Truxtun Avenue, Suite 240
Bakersfield, CA 93301

June 6, 2010

BSK Associates
Engineers & Laboratories

700 22nd Street
Bakersfield CA 93301
P 661.327.0671
F 661.324.4218
www.bskassociates.com

VIA US MAIL & E-MAIL

June 6, 2011 **BSK G11-003-11B**

Ms. Celina Garcia
AP Architects, Inc.
3434 Truxtun Avenue, Suite 240
Bakersfield, CA 93301

SUBJECT: **Geotechnical Engineering Investigation**
and Geologic / Seismic Hazards Evaluation
Proposed Student Center
West Hills College, Lemoore
Lemoore, California

Dear Ms. Garcia:

BSK Associates (BSK) has completed the geotechnical investigation and geologic and seismic hazards evaluation for the proposed West Hills College Student Center in Lemoore, California. The geotechnical investigation, which included a field exploration, laboratory testing program, engineering analysis, and preparation of this report, was conducted in accordance with our proposal BSK GB10-5306, dated December 6, 2010. The enclosed report provides geotechnical recommendations for use in preparation of plans and specifications for the subject project. Appendix C provides the Geologic and Seismic Hazards Evaluation.

We appreciate the opportunity to assist you during the design phase of your project and look forward to continuing our relationship on this project through construction. If you have any questions, please contact us.

Respectfully submitted,
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GEOTECHNICAL ENGINEERING INVESTIGATION REPORT
AND GEOLOGIC AND SEISMIC HAZARDS EVALUATION
PROPOSED STUDENT CENTER
WEST HILLS COLLEGE, LEMOORE
LEMOORE, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of a Geotechnical Engineering Investigation and Geologic & Seismic Hazards Evaluation conducted by BSK Associates (BSK) for the proposed West Hills College, Lemoore Student Center (Site). The Site is located southeast of the intersection of Bush Street and College Avenue in Lemoore, California as shown on the Site Vicinity Map, Figure A-1. The geotechnical engineering investigation was conducted in accordance with BSK Proposal GB10-5306, dated December 6, 2010.

This report provides a description of the geotechnical conditions at the site and provides specific recommendations for earthwork and foundation design with respect to the planned building. In the event that changes occur in the design of the project, this report's conclusions and recommendations will not be considered valid unless the changes are reviewed with BSK and the conclusions and recommendations are modified or verified in writing. Examples of such changes would include location, size of structures, foundation loads, basement addition, etc.

1.1 PLANNED CONSTRUCTION

BSK's understanding of the planned project is based on information provided from Ms. Celina Garcia with AP Architects. We understand that the proposed building will be a single story, concrete slab-on-grade structure. The building pad will be raised 5 feet to enhance constructability and provide site drainage. The building will have CMU exterior walls and light metal stud interior framing. Structural loads were provided during our investigation. Based on the information provided by AP Architects, the structural loads to be on the order of 0.36 kips per lineal foot for wall loads, and column loads on the order of 65 kips. In addition to the planned structure, concrete flat works areas are planned.

In the event that significant departures are identified between our assumed structural characteristics and foundation loading, and those reflecting the actual proposed construction, then we should be notified in writing and be given the opportunity to verify or amend this report and its recommendations to reflect the corresponding changes.

1.2 PURPOSE AND SCOPE OF SERVICES

The objective of this geotechnical investigation was to characterize the subsurface conditions in the areas of the proposed building and concrete flat works areas, and provide geotechnical engineering recommendations for the preparation of plans and specifications. The scope of the investigation included a field exploration, laboratory testing, engineering analyses, preparation of this report, and preparation of a geologic/seismic hazards evaluation report that is provided in Appendix C.

2.0 FIELD INVESTIGATION AND LABORATORY TESTING

2.1 FIELD EXPLORATION

The field exploration for this investigation was conducted under the oversight of a BSK Staff Engineer. Eight (8) borings were drilled at the site between May 12 and May 19, 2011 using a truck-mounted hollow stem auger drill rig and hand auguring equipment. Four (4) CPT soundings were taken around the site to a maximum explored depth of 50 feet. The hand auger and hollow stem auger borings were drilled to depths ranging from 5 to 21.5 feet beneath the existing ground surface (bgs). The locations of the borings are indicated on the Boring Location Map, Figure A-2. Details of the field exploration and the boring logs are provided in Appendix A.

2.2 LABORATORY TESTING

Laboratory tests were performed on selected soil samples to evaluate moisture content, dry density, shear strength, consolidation properties, expansion potential, corrosion characteristics, fines content, and maximum dry density and optimum moisture content. A description of the laboratory test methods and results are presented in Appendix B.

3.0 SITE CONDITIONS

The following sections address the geologic setting, site description, surface and subsurface conditions, and groundwater conditions at the Site. This information is based on BSK's field exploration, and published maps and reports.

3.1 OVERVIEW OF GEOLOGIC SETTING

The Site is located in the southeast quarter of the northwest quarter of Section 8, Township 19 South, Range 20 East, Mount Diablo Base and Meridian. The coordinates for the site location are 36.21219° North latitude and 119.82609° West longitude. Appendix C provides further information on the regional geology.

3.2 SITE DESCRIPTION AND SURFACE CONDITIONS

The Site is currently in an open field within the campus, to the south of some existing buildings. A large earth pad was placed at the location previously. The pad is about 5 feet high and covers most of the area occupied by the proposed Student Center footprint. The integrity of the pad is in question because of its observed condition. There are many animal burrows, which are located around the existing building pad, there are no compaction testing records available, and the time of construction is unknown. The in place relative compaction at the upper 4 feet of the existing pad ranged from 79 to 93 percent and the majority of the compaction results were below 90 percent (based on ASTM D1557). The results of the in place dry densities are presented in Table B-3 in Appendix B.

The rest of the site is flat with dry grass. The site is bounded by WHC, Lemoore to the north and east, and by open fields to the south and west.

3.3 SUBSURFACE CONDITIONS

The soils encountered during our subsurface exploration consisted of silty sands, silty clays, clayey silts, and sandy silts. Based on the hand auguring soil boring data, the existing building pad consists primarily of silty sand. Based on hollow stem auger borings and CPT soundings, the native soil consists primarily of silty clays and clayey silts in the upper 10 feet. The soil below 10 feet is layered sand and silt with some silty clay. The maximum explored depth was 50 feet. Based on the results of the consolidation tests, the on-site soils below 2 feet are considered to have a low potential for hydrocompaction. The upper 5 feet of the on-site soils are considered to have medium expansion potential with an expansion index of 83. The soils were classified in the field during drilling operations. The stratification lines were approximated based on observations made at the time of drilling. The actual boundaries between different soil types may be gradual and soil conditions may vary between points of exploration. For a more detailed description of the subsurface materials encountered, the logs of the borings should be consulted Borings B-01 through B-08 in Appendix A. These logs include the soil type, color, moisture and dry density, and the applicable Unified Soil Classification Chart presented on Figure A-3. The CPT soundings can be consulted for depths greater than 16.5 feet bgs. The logs of the CPT soundings are found in Appendix C.

3.4 GROUNDWATER CONDITIONS

Groundwater was encountered in the borings during our investigation at a depth of 7 feet bgs between May 12 and May 19, 2011. To ascertain groundwater levels for the area during other times, groundwater elevation data from the California Department of Water Resources (DWR) was reviewed. Water level hydrographs from wells near the Site are presented in Appendix C. The hydrographs indicate that the historical shallowest depth to groundwater near the Site from 1950 to 2007 was approximately 6 feet bgs.

3.5 SEISMICALLY INDUCED SETTLEMENT

Our analysis indicates that during the design event, the factor of safety against liquefaction is less than a value of 1.0 (acceptable for most structures) in some minor subsurface units. Based on the limited thickness of the potential liquefiable units (less than two feet), the overall potential for significant liquefaction to occur at the Site is low.

Liquefaction analyses were performed assuming the shallowest groundwater depth of 6 feet and incorporating information from the boring logs and CPT logs. Four (4) CPT soundings were performed. The locations of the CPT soundings are presented in the Boring Location Map, Figure A-2, Appendix A.

The range of total seismically induced settlement for the MCE is approximately 1.0 to 1.4 inches and the associated differential settlement is approximately 0.4 inches spanning a distance of approximately 100 feet between CPT locations. The design standard for buildings under extreme seismic events is that they do not collapse, though they may be damaged. These magnitudes of settlement are consistent with the designs standard.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the data collected during this investigation, and from a geotechnical engineering standpoint, it is our opinion that the geologic setting or soil conditions would not preclude the construction of the proposed improvements. The near-surface soils across the project site consist primarily of silty sands, silty clays, and clayey silts that may be considered to have favorable bearing characteristics for design purposes. However, our test borings indicate that there are localized zones of moderately expansive soils in the upper 6 feet at the site within the planned building and concrete flat works. These conditions will require localized over excavation and replacement with an approved engineered fill pending inspection by the geotechnical engineer once the areas have been fully exposed during earthwork operations. Also, another geotechnical constraint is the shallow groundwater.

The proposed structures may be supported on reinforced concrete foundations provided that the recommendations presented herein are incorporated into the design and construction of the project.

4.1 SEISMIC DESIGN CRITERIA

There are not any known active or potentially active fault zones within 30 miles of the project site. Based on sampler blow counts and the correlated Standard Penetration Test (SPT) "N" values from our soil borings and in accordance with Table 1613.5.2 of the 2010 California Building Code (CBC), the site can be classified as Site Class D ($15 \leq N \leq 50$).

Use of the 2010 California Building Code (CBC) seismic design criteria is considered appropriate and the following parameters should be considered applicable for the structural design of structural improvements:

Table 1: Seismic Design Parameters

Seismic Design Parameter	Value		Reference
MCE Mapped Spectral Acceleration (g)	$S_S = 0.81$	$S_1 = 0.31$	USGS Mapped Value
Amplification Factors (Site Class D)	$F_a = 1.18$	$F_v = 1.78$	Table 1613.5.3
Site Adjusted MCE Spectral Acceleration (g)	$S_{MS} = 0.95$	$S_{M1} = 0.55$	Equations 16-37, 38
Design Spectral Acceleration (g)	$S_{DS} = 0.63$	$S_{D1} = 0.37$	Equations 16-39, 40
Design Peak Ground Acceleration (S_{DS} /2.5) (g)	PGA = 0.25		CGS Note 48

As shown above, the mapped spectral acceleration parameter at 1-second period (S_1) is less than 0.75 and is greater than 0.20, therefore the site lies in Seismic Design Category D as specified in Section 1613.5.6 of the 2010 CBC. Appendix C provides the complete details of the Seismic Hazard Assessment performed.

4.2 SOIL CORROSIVITY

One soil sample was analyzed to evaluate the potential for concrete deterioration or steel corrosion due to attack by soluble salts in the on-site soils. Based on the test results, native, near-surface soils have high soluble sulfate and chloride contents, a low resistivity, and are slightly basic. Native soils are generally considered to have a high corrosion potential with respect to buried concrete and metal conduits. We recommend that Type V cement be used in the formulation of concrete and buried reinforcing steel protection with a minimum concrete cover required by the American Concrete Institute (ACI) Building Code Requirements for Structural Concrete, ACI 318-95, Chapter 7.7. We recommend the use of a water/cement ratio of 0.45. Buried metal conduits should have a protective coating in accordance with the manufacturer's specifications. If detailed recommendations for corrosion protection are desired, a corrosion specialist must be consulted.

4.3 SITE PREPARATION AND EARTHWORK CONSTRUCTION

The following procedures must be implemented during Site preparation for the proposed Site improvements. References to maximum dry density, optimum moisture content, and relative compaction are based on ASTM D 1557 (latest test revision) laboratory test procedures.

1. The areas of proposed improvements should be cleared of surface vegetation and debris. Materials resulting from the clearing and stripping operations should be removed and properly disposed of off-site. Removal of vegetation must be complete and include the associated root systems. The anticipated stripping depth is 4 to 6 inches. Organic rich strippings must not be used in engineered fill but may be used in landscape areas.
2. At the building pad area, based on our compaction test results, the existing pad has average compaction below 90 percent. Therefore, the existing pad should be removed. After the existing pad is removed, the site should be over-excavated to a depth of 12 inches below existing grade or 12 inches below the bottom of the footing elevation, whichever is greater. The overexcavation must extend at least five feet laterally outside the planned building.
3. Following the required stripping and over-excavation, ***the exposed ground surface must be inspected by the Geotechnical Engineer to evaluate if loose or soft zones are present that will require additional over excavation.*** Following approval by the Geotechnical Engineer, the ground surface must be scarified a depth of 8 inches, moisture conditioned to within two percent (2%) of optimum moisture content, and compacted to at least 90 percent of the maximum dry density. Over-excavated areas must be backfilled with engineered fill as described below. The upper 12 inches in paved areas should be compacted to a minimum of 95 percent relative compaction.
4. Generally, the near surface on-site soils are considered to have a moderate expansion potential. At the building pad and exterior concrete flatworks, these soils may be used at a minimum of two feet below the finished pad. The existing pad material can be used as engineered fill as long as the material is placed two feet below the finished pad elevation. Imported or native excavated soils, free of organic materials or deleterious substances, may be placed as engineered fill. On-site clayey soil as engineered fill must be placed in uniform layers not exceeding 8 inches in loose thickness, moisture conditioned to within 2 to 4 percent above optimum moisture content, and compacted to at least 90 percent relative compaction. Import soil as engineered fill must be placed in uniform layers not exceeding 8 inches in loose thickness, moisture conditioned to within 2 percent of optimum moisture content, and compacted to at least 90 percent relative compaction.
5. Import fill materials must be free from organic materials or deleterious substances. The project specifications must require the contractor to contact BSK to review the proposed import fill materials for conformance with these recommendations at least one week prior to importing to the Site, whether from on-site or off-site borrow areas. Imported fill soils must be non-hazardous and derived from a single, consistent soil type source conforming to the following criteria:

Plasticity Index:	< 12
Expansion Index:	< 20 (Very Low Expansion Potential)
Maximum Particle Size:	3 inches
Percent Passing #4 Sieve:	65 - 100
Percent Passing #200 Sieve:	20 - 45
Minimum R-value (in paved areas)	30
Low Corrosion Potential:	Soluble Sulfates < 1,500 ppm
	Soluble Chlorides < 300 ppm
	Minimum Resistivity > 5,000 ohm-cm

6. If possible, earthwork operations should be scheduled during a dry, warm period of the year. Should these operations be performed during or shortly following periods of inclement weather, unstable soil conditions may result in the soils exhibiting a "pumping" condition. This condition is caused by excess moisture, in combination with compaction, resulting in saturation and zero air voids in the soils. If this condition occurs, the adverse soils will need to be over-excavated to the depth at which stable soils are encountered, and replaced with suitable soils compacted as engineered fill. Alternatively, the Contractor may proceed with grading operations after utilizing a method to stabilize the soil subgrade, which should be subject to review and approval by BSK prior to implementation.

4.4 Foundations

Provided the Site is prepared as recommended above, the proposed structures may be supported on continuous, or isolated shallow foundations bearing on engineered fill. The thickness of foundations and steel reinforcement must be designed by the Project Structural Engineer.

Continuous and isolated spread footings must have a minimum width of 12 inches and 24 inches, respectively. Spread footing foundations may be designed using a net allowable bearing pressure of 3,000 pounds per square foot (psf). This bearing value applies to the dead load plus live load (DL + LL) condition, and may be increased by 1/3 for short duration wind or seismic loads. Total foundation settlements are expected to be less than 0.5-inches and differential settlements between similarly loaded (DL + LL) and sized footings are anticipated to be less than 0.25-inches. Due to the predominantly granular nature of the foundation soils, the majority of the settlement is expected to occur within a few months after the design loads are applied.

A modulus of subgrade reaction of 120 pci can be used for design.

4.5 Lateral Earth Pressures and Frictional Resistance

Provided the Site is prepared as recommended above, the following earth pressure parameters for footings may be used for design purposes. The parameters shown in the table below are for drained conditions of select engineered fill or undisturbed native soil.

Table 2: Recommended Static Lateral Earth Pressures

Lateral Pressure Condition	Equivalent Fluid Density (pcf) Drained Condition
Active Pressure	35
At-Rest Pressure	55
Passive Pressure	390

Active pressure refers to walls that are free to rotate. At-rest pressure refers to walls that are restrained against rotation. The lateral earth pressures listed herein assume level backfill. The conventional equation for active, at-rest, and passive conditions, using soil bulk unit weights of 120 pcf are appropriate for the medium dense to dense sand and silty sand above the groundwater because undrained conditions prevail in the soil mass.

A coefficient of friction of 0.4 may be used between soil sub-grade and the bottom of footings. The coefficient of friction and passive earth pressure values given above represent ultimate soil strength values. BSK recommends that a safety factor consistent with the design conditions be included in their usage. For stability against lateral sliding that is resisted solely by the passive earth pressure against footings or friction along the bottom of footings, a minimum safety factor of 1.5 is recommended. For stability against lateral sliding that is resisted by combined passive pressure and frictional resistance, a minimum safety factor of 2.0 is recommended. For lateral stability against seismic loading conditions, a minimum safety factor of 1.2 is recommended.

4.6 EXCAVATION STABILITY

Soils encountered within the depth explored are generally soils Type C in accordance with OSHA (Occupational Safety and Health Administration). The slopes surrounding or along temporary excavations may be vertical for excavations that are less than five feet deep and exhibit no indication of potential caving, but should be no steeper than 1H:1V for excavations that are deeper than five feet, up to a maximum depth of 15 feet. Certified trench shields or boxes may also be used to protect workers during construction in excavations that have vertical sidewalls and are greater than 5 feet deep. Temporary excavations for the project construction should be left open for as short a time as possible and should be protected from water runoff. In addition, equipment and/or soil stockpiles must be maintained at least 10 feet away from the top of the excavations. Because of variability in soils, BSK must be afforded the opportunity to observe and document sloping and shoring conditions at the time of construction. Slope height, slope inclination, and excavation depths (including utility trench excavations) must in no case exceed those specified in local, state, or federal safety regulations, (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations).

4.7 PIPE BEDDING AND ENVELOPE

A minimum of 6 inches of bedding material is recommended for pipe installations. The bedding material and backfill within the pipe envelope (up to 12 inches above the pipe) should consist of sandy material with not more than 10 percent passing the #200 sieve, 100 percent passing the 3/8-inch sieve, and a sand equivalent of at least 30.

In the case of flexible pipe installation, a minimum of eight inches (8”) of bedding material is recommended for pipe installation. Bedding material must consist of medium- or coarse-grained sand with a Sand Equivalent of at least 25. As an alternative to using sand, the pipe bedding and envelope material may consist of Class 2 Aggregate Base as specified in Section 26 of the Caltrans Standard Specifications or sand–cement slurry that contains 1.5 to 2.0 sacks of cement per yard of material and has a 4- to 6-inch slump.

Bedding and pipe envelope must be placed in loose thickness not exceeding 10-inches and compacted to at least 90 percent of the maximum dry density of ASTM D1557. Soil backfill moisture content during compaction must be maintained within two percent (2%) of optimum. Water jetting to attain compaction should not be allowed. Class 2 Aggregate Base, when used for bedding or pipe envelope must be compacted to at least 92 percent of ASTM D1557.

4.8 TRENCH BACKFILL AND COMPACTION

Processed on-site soils, which are free of organic material, are suitable for use as general trench backfill above the pipe envelope. Native soil with particles less than three inches in the greatest dimension may be incorporated into the backfill and compacted as specified above, providing they are properly mixed into a matrix of friable soils. The backfill must be placed in thin layers not exceeding 12 inches in loose thickness, be well-blended and consistent texture, moisture conditioned to at least optimum moisture content, and compacted to at least 90 percent of the maximum dry density as determined by the ASTM D1557. The uppermost 24 inches of trench backfill below pavement sections must be compacted to at least 95 percent of the maximum dry density as determined by ASTM D1557. Moisture content within two percent of optimum must be maintained while compacting this upper 24 inch trench backfill zone.

We recommend that trench backfill be tested for compliance with the recommended Relative Compaction and moisture conditions. Field density testing should conform to ASTM Test Methods D1556 or D6938. We recommend that field density tests be performed in the utility trench bedding, envelope and backfill for every vertical lift, at an approximate longitudinal spacing of not greater than 150 feet. Backfill that does not conform to the criteria specified in this section should be removed or reworked, as applicable over the trench length represented by the failing test so as to conform to BSK recommendations.

4.9 CONCRETE SLABS-ON-GRADE

Non-structural Concrete slab-on-grade floors must be a minimum of 4-inches thick and must be supported on a compacted subgrade prepared in accordance with Section 4.3. In order to regulate cracking of the slabs, construction joints and/or control joints must be provided in each direction at a maximum spacing of 10 feet along with steel reinforcement as recommended by the Project Structural Engineer. Control joints must have a minimum depth of one-quarter of the slab thickness.

Due to the difficulty of installing and maintaining woven or welded wire mesh (WWM) in the middle of concrete slabs-on-grade during construction, it is recommended that any steel reinforcement used in concrete slabs-on-grade consist of steel rebar.

Interior concrete slabs must be successively underlain by: 1-½ inches of washed concrete sand; a durable vapor barrier; and a smooth, compacted subgrade surface. The vapor barrier must meet the requirements of ASTM E 1745 Class A and have a water vapor transmission rate (WVTR) of less than or equal to 0.012 Perms as tested by ASTM E 96. Examples of acceptable vapor barrier products include: Stego Wrap (15-mil) Vapor Barrier by STEGO INDUSTRIES LLC; W.R. Meadows Premoulded Membrane with Plasmatic Core; and Zero-Perm by Alumiseal. Because of the importance of the vapor barrier, joints must be carefully spliced and taped. If migration of subgrade moisture through the slab is not a concern, then the vapor barrier and overlying sand may be deleted. The building subgrade must be kept in a moist condition until the vapor barrier or concrete slab is placed. BSK's representative must be called to the Site to review soil and moisture conditions immediately prior to placing the vapor barrier or concrete slab.

As indicated in the recent PCA Engineering Bulletin 119, Concrete Floors and Moisture, and applicable ACI Committee reports (see ACI 360R-06, Design of Slabs-on-Ground, dated October 2006 and ACI 302.1R-04, Guide for Concrete Floor and Slab Construction, dated June 2004), the sand layer between the vapor barrier and concrete floor slab may be omitted. This must reduce the amount of moisture that can be transmitted through the slab (especially if the sand layer becomes very moist or wet prior to placing the concrete); however, the risk of slab "curling" is much greater. The "curling" may result from a sharp contrast in moisture-drying conditions between the exposed slab surface and the surface in contact with the membrane. As recommended in the referenced ACI Committee reports, measures must be taken to reduce the risk of "curling" such as reducing the joint spacing, using a low shrinkage mix design, and reinforcing the concrete slab. In order to regulate cracking of the slab, we recommend that full depth construction joints and control joints be provided in each direction with slab thickness and steel reinforcing recommended by the structural engineer.

Excessive landscape water or leaking utility lines could create elevated moisture conditions under concrete slabs, which could result in adverse moisture or mildew conditions in floor slabs or walls. Accordingly, care must be taken to avoid excess irrigation around the structures, as well as to periodically monitor for leaking utility lines. Likewise, positive surface drainage must be provided around the perimeter of the structures.

As indicated above, the control of the deleterious effects of moisture vapor transmission on flooring materials can be substantially improved by the use of a low porosity concrete. This can be achieved by specifying a low water: cement ratio (0.45 or less by weight), 4,000 psi compressive strength at 28 days and a minimum of 7 days wet-curing.

4.10 SURFACE DRAINAGE CONTROL

The control of surface drainage in the project areas is an important design consideration. BSK recommends the following:

- Final grading around concrete or asphalt pavement must provide for positive and enduring drainage away from the buildings, and ponding of water must not be allowed around, near the buildings, or on any of the paved surfaces. Paved surfaces next to the buildings must have at least a 2 percent gradient away from the building.
- Landscaping must be carefully planned to provide positive and enduring drainage away from the buildings, minimize irrigation of the area within 5 feet of the buildings, and prevent saturation of the soils immediately adjacent to or below the building areas. Unpaved landscape areas must be sloped with at least a 5 percent gradient away from the building for a distance of at least 10 feet.

Irrigation water must be applied in amounts not exceeding those required to offset evaporation, sustain plant life, and maintain a relatively uniform moisture profile around the perimeter of, and below, Site improvements

5.0 PLANS AND SPECIFICATIONS REVIEW

BSK recommends that it be retained to review the draft plans and specifications for the project, with regard to foundations and earthwork, prior to their being finalized and issued for construction bidding.

6.0 CONSTRUCTION TESTING AND OBSERVATIONS

Geotechnical testing and observation during construction is a vital extension of this geotechnical investigation. BSK recommends that it be retained for those services. Field review during site preparation and grading allows for evaluation of the exposed soil conditions and confirmation or revision of the assumptions and extrapolations made in formulating the design parameters and recommendations. BSK's observations must be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. BSK must also be called to the site to observe foundation excavations, prior to placement of reinforcing steel or concrete, in order to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report. BSK must also be called to the Site to observe placement of foundation and slab concrete.

If a firm other than BSK is retained for these services during construction, that firm must notify the owner, project designers, governmental building officials, and BSK that the firm has assumed the responsibility for all phases (i.e., both design and construction) of the project within the purview of the geotechnical engineer. Notification must indicate that the firm has reviewed this report and any subsequent addenda, and that it either agrees with BSK's conclusions and recommendations, or that it will provide independent recommendations.

7.0 LIMITATIONS

The analyses and recommendations submitted in this report are based upon the data obtained from the test borings performed at the locations shown on Figure A-2. The report does not reflect variations which may occur between or beyond the borings. The nature and extent of such variations may not become evident until construction is initiated. If variations then appear, a re-evaluation of the recommendations of this report will be necessary after performing on-site observations during the excavation period and noting the characteristics of the variations.

The validity of the recommendations contained in this report is also dependent upon an adequate testing and observation program during the construction phase. BSK assumes no responsibility for construction compliance with the design concepts or recommendations unless it has been retained to perform the testing and observation services during construction as described above.

The findings of this report are valid as of the present. However, changes in the conditions of the Site can occur with the passage of time, whether caused by natural processes or the work of man, on this property or adjacent property. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation, governmental policy or the broadening of knowledge.

BSK has prepared this report for the exclusive use of the Client and members of the project design team. The report has been prepared in accordance with generally accepted geotechnical engineering practices which existed in Kings County at the time the report was written. No other warranties either expressed or implied are made as to the professional advice provided under the terms of BSK's agreement with Client and included in this report.

Respectfully submitted

BSK Associates

APPENDIX A

Field Exploration

APPENDIX A

FIELD EXPLORATION

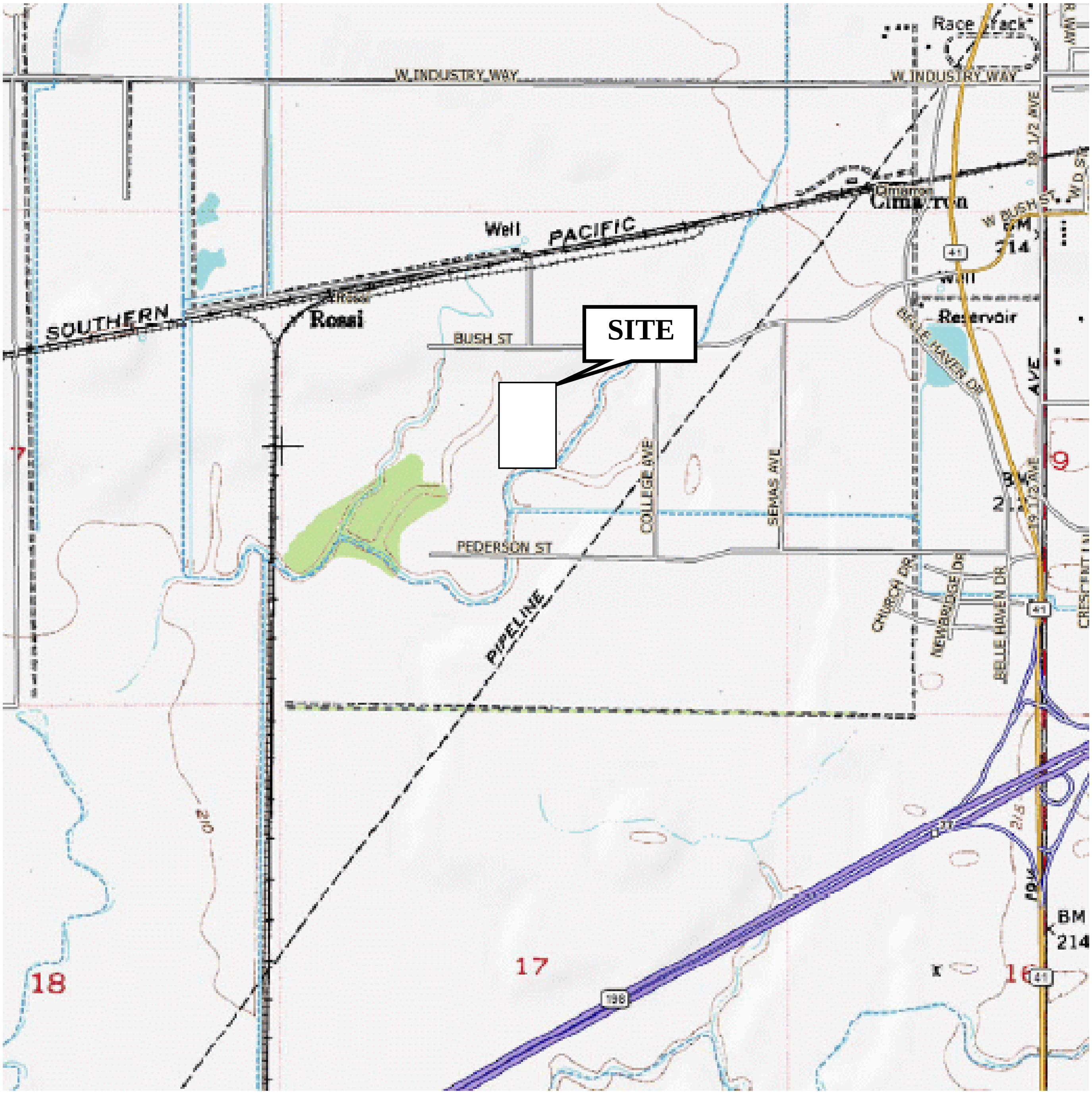
The field exploration at the Site was conducted from May 12 to May 19, 2011, under the oversight of a BSK Staff Engineer. A total of eight (8) soil borings were drilled within the planned improvements and structures. Four of the test borings were drilled to depths of approximately 5 feet bgs in areas of the existing pad. Three (3) borings were drilled to approximately 16.5 feet bgs and one (1) to approximately 21.5 feet bgs in the proposed building. Borings were drilled using a truck-mounted drill rig with hollow stem auger and a hand-auger. Four (4) CPT soundings were also taken around the perimeter of the site. The approximate locations of the test borings are indicated on Figure A-2.

The soil materials encountered in the test borings were visually classified in the field, and the Staff Engineer recorded logs during the drilling and sampling operations. Visual classification of the materials encountered in the test borings was made in general accordance with the Unified Soil Classification System (ASTM D 2488). A soil classification chart is presented herein. Boring logs are presented herein and should be consulted for more details concerning subsurface conditions. Stratification lines were approximated by the field staff based on observations made at the time of drilling, while the actual boundaries between soil types may be gradual and soil conditions may vary at other locations.

Subsurface samples were obtained at the successive depths shown on the boring logs by driving samplers which consisted of a 2.5-inch inside diameter (I.D.) California Sampler and a 1.4-inch I.D. Standard Penetration Test (SPT) Sampler. The samplers were driven 18 inches using a 140-pound hammer dropped from a height of 30 inches by means of either an automatic hammer or a down-hole “safety hammer”. The number of blows required to drive the last 12 inches was recorded as the blow count (blows/foot) on the boring logs. The relatively undisturbed soil core samples were capped at both ends to preserve the samples at their natural moisture content. Soil samples were also obtained using the SPT Sampler lined with metal tubes or unlined in which case the samples were placed and sealed in polyethylene bags. At the completion of the field exploration, the test borings were backfilled with the excavated soil cuttings.

It should be noted that the use of terms such as “loose”, “medium dense”, “dense” or “very dense” to describe the consistency of a soil is based on sampler blow count and is not necessarily reflective of the in-place density or unit weight of the soils being sampled. The relationship between sampler blow count and consistency is provided in the following Tables A-1 and A-2 for coarse-grained (sandy and gravelly) soils and fine grained (silty and clayey) soils, respectively.

BSK Job No. G11-003-11B
June 2011
Figure A-1



Map Reference:. 3-D TopoQuads Copyright 2009 Delorme Yarmouth, ME 04096 Source Data: USGS Setail: 13-1 Datum: WGS84

N

Approximate Scale

0 2050 Ft

1 inch = 2050 Feet

SITE VICINITY MAP

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LEGEND

⊕	**B1**	Approximate Boring Location
◇	**CPT 1, NE**	Approximate Location of Cone Penetration Test boring

BSK JOB G11 003 11B
June 2011
Figure A-2

Map Reference: Google Earth 2011

N

Approximate Scale

0 90 Feet
1 inch = 90 Feet

BORING LOCATION MAP

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Table A-1: Consistency of Coarse-Grained Soil by Sampler Blow Count		
Consistency Descriptor	**SPT Blow Count (#Blows / Foot)**	**2.5” I.D. California Sampler Blow Count (#Blows / Foot)**
Very Loose	<4	<6
Loose	4 – 10	6 – 15
Medium Dense	10 – 30	15 – 45
Dense	30 – 50	45 – 80
Very Dense	>50	>80

Table A-2: Consistency of Fine-Grained Soil by Sampler Blow Count		
Consistency Descriptor	**SPT Blow Count (#Blows / Foot)**	**2.5” I.D. Cal. Sampler Blow Count (# Blows / Foot)**
Very Soft	<2	<3
Soft	2 – 4	3 – 6
Medium Stiff	4 – 8	6 – 12
Stiff	8 – 15	12 – 24
Very Stiff	15 – 30	24 – 45
Hard	>30	>45

MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS More than Half >#200	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL- SAND MIXTURES
		GRAVELS WITH OVER 15% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 15% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS More than Half <#200 sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS , MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

Note: Dual symbols are used to indicate borderline soil classifications.

⧗	Pushed Shelby Tube	RV	R-Value
☒	Standard Penetration Test	SA	Sieve Analysis
■	Modified California	SW	Swell Test
◧	Auger Cuttings	TC	Cyclic Triaxial
▨	Grab Sample	TX	Unconsolidated Undrained Triaxial
■	Sample Attempt with No Recovery	TV	Torvane Shear
CA	Chemical Analysis	UC	Unconfined Compression
CN	Consolidation	(1.2)	(Shear Strength, ksf)
CP	Compaction	WA	Wash Analysis
DS	Direct Shear	(20)	(with % Passing No. 200 Sieve)
PM	Permeability	∇	Water Level at Time of Drilling
PP	Pocket Penetrometer	▼	Water Level after Drilling (with date measured)

SOIL CLASSIFICATION CHART AND KEY TO TEST DATA
Unified Soil Classification System

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PLATE: Figure A-3

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LOG OF BORING NO. B-01

Project Name: **WHC, Lemoore**
Location: **Lemoore, California**
Job Number: **G11 003 10B**

Surface El.:
Location: **N 36.29229, W 119.82618**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plasticity Index	Expansion Index
		ML: SANDY SILT: Olive Brown; moist.										
		… SANDY SILT: Olive Brown; moist; asphalt encountered.	■					116	9			
		… SANDY SILT: Olive Brown; moist.	■					114	11			
5		End Of Boring.										
10												
15												
20												
25												

Completion Depth: **5.0**
Date Started: **5/12/11**
Date Completed: **5/12/11**
Logged By: **C. Richardson**
Checked By: **O. Lau**

Drilling Equipment and Method: Hand Auger

Remarks: Boring terminated at 5 feet. Boring backfilled with soil cuttings. Groundwater was not encountered.

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LOG OF BORING NO. B-02

Project Name: **WHC, Lemoore**
Location: **Lemoore, California**
Job Number: **G11 003 10B**

Surface El.:
Location: **N 36.29231, W 119.82636**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plasticity Index	Expansion Index
	░	SM: SILTY SAND: Very dark grayish brown; fine to medium grained; moist.										
	░	" "	■					103	11			
	▨	CL: SILTY CLAY: Very dark gray; moist.										
	▨	" "	■					103	17			
5		End Of Boring.										
10												
15												
20												
25												

Completion Depth: **5.0**
Date Started: **5/12/11**
Date Completed: **5/12/11**
Logged By: **C. Richardson**
Checked By: **O. Lau**

Drilling Equipment and Method: Hand Auger

Remarks: Boring terminated at 5 feet. Boring backfilled with soil cuttings. Groundwater was not encountered.

LOG OF BORING NO. B-03

BSK & ASSOCIATES
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Bakersfield CA 93301
Telephone: 661-327-0671

Project Name: **WHC, Lemoore**
Location: **Lemoore, California**
Job Number: **G11 003 10B**

Surface El.:
Location: **N 36.29260, W 119.8262**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plasticity Index	Expansion Index
	⁘	SM: SILTY SAND: Very dark grayish brown; fine to medium grained; moist.										
	⁘	" "	■					118	8			
	▨	CL: SILTY CLAY: Very dark gray; moist; trace of clay.	■					105	10			
5		End Of Boring.										
10												
15												
20												
25												

Completion Depth: **5.0**
Date Started: **5/12/11**
Date Completed: **5/12/11**
Logged By: **C. Richardson**
Checked By: **O. Lau**

Drilling Equipment and Method: Hand Auger

Remarks: Boring terminated at 5 feet. Boring backfilled with soil cuttings. Groundwater was not encountered.

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LOG OF BORING NO. B-04

Project Name: **WHC, Lemoore**
Location: **Lemoore, California**
Job Number: **G11 003 10B**

Surface El.:
Location: **N 36.29258, W 119.82639**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plasticity Index	Expansion Index
	░	SM: SILTY SAND: Very dark grayish brown; fine to medium grained; moist.										
	░	" "	■					100	7			
	▨	CL: SILTY CLAY: Very dark gray; moist.	■					107	14			
5		End Of Boring.										
10												
15												
20												
25												

Completion Depth: **5.0**
Date Started: **5/12/11**
Date Completed: **5/12/11**
Logged By: **C. Richardson**
Checked By: **O. Lau**

Drilling Equipment and Method: Hand Auger

Remarks: Auger Refusal at 5 feet. Boring backfilled with soil cuttings. Groundwater was not encountered.

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LOG OF BORING NO. B-05

Project Name: **WHC, Lemoore**
Location: **Lemoore, California**
Job Number: **G11 003 10B**

Surface El.:
Location: **N 36.29275, W 119.82618**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plasticity Index	Expansion Index
	▨	CL: SILTY CLAY: Olive; moist.										
	▨	… VERY STIFF SILTY CLAY: Olive; moist.	■		19			103	22			
5	▨	" "	■		17			113	18			
	▨	▽										
10	░	SM: MEDIUM DENSE SILTY SAND: Olive; fine to medium grained; wet.	■		25							
15	▩	CH: STIFF CLAY: Olive; wet.	☒		13							
	░	SM: SILTY SAND: Olive; fine to medium grained; wet.										
20												
		End Of Boring.										
25												

Completion Depth: **21.5**
Date Started: **5/19/11**
Date Completed: **5/19/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Mobile-60 w/8" Hollow Stem Auger

Remarks: Boring terminated at 21.5 feet. Boring backfilled with soil cuttings. Groundwater encountered at 7 feet.

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LOG OF BORING NO. B-06

Project Name: **WHC, Lemoore**
Location: **Lemoore, California**
Job Number: **G11 003 10B**

Surface El.:
Location: **N 36.29271, W 119.82644**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plasticity Index	Expansion Index
	▨	CL: SILTY CLAY: Olive; moist.										
	▨	… VERY STIFF SILTY CLAY: Olive; moist.	■		26			110	20			
5	▨	… VERY STIFF SANDY CLAY: Light olive; moist.	■		18			112	19			
	▨	∇										
10	⁘	SM: MEDIUM DENSE SILTY SAND: Light olive brown; fine grained; wet.	■		28			108	19			
15	▨	CL: MEDIUM STIFF SILTY CLAY: Light olive brown; wet.	☒		11							
		End Of Boring.										
20												
25												

Completion Depth: **16.5**
Date Started: **5/19/11**
Date Completed: **5/19/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Mobile-60 w/8" Hollow Stem Auger

Remarks: Boring terminated at 16.5 feet. Boring backfilled with soil cuttings. Groundwater encountered at 7 feet.

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LOG OF BORING NO. B-07

Project Name: **WHC, Lemoore**
Location: **Lemoore, California**
Job Number: **G11 003 10B**

Surface El.:
Location: **N 36.29216, W 119.82645**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plasticity Index	Expansion Index
	▥	MH: CLAYEY SILT: Olive Brown; moist.										
	▥	… VERY STIFF CLAYEY SILT: Olive Brown; moist.	■		21			118	15			
5	▨	CL: VERY STIFF SILTY CLAY: Olive Brown; moist.	■		22			111	18			
	░	▽ SM: SILTY SAND: Light olive brown; fine grained; wet.										
	▧	CH: CLAY: Light olive gray; wet.										
10	▧	… VERY STIFF CLAY: Light olive gray; wet; End Of Boring.	■		27			99	28			
	▯	ML: SILT: Olive gray & red; moist.										
15	░	SM: LOOSE SILTY SAND: Olive yellow; fine to medium grained; wet.	☒		6							
		End Of Boring.										
20												
25												

Completion Depth:	**16.5**
Date Started:	**5/19/11**
Date Completed:	**5/19/11**
Logged By:	**K. Schwartz**
Checked By:	**O. Lau**

Drilling Equipment and Method: Mobile-60 w/8" Hollow Stem Auger

Remarks: Boring terminated at 16.5 feet. Boring backfilled with soil cuttings. Groundwater encountered at 7 feet.

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LOG OF BORING NO. B-08

Project Name: **WHC, Lemoore**
Location: **Lemoore, California**
Job Number: **G11 003 10B**

Surface El.:
Location: **N 36.29212, W 119.82615**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plasticity Index	Expansion Index
		SM: SILTY SAND: Dark olive brown; fine grained; moist.										
		… MEDIUM DENSE SILTY SAND: Dark olive brown; fine grained; moist.	■		33			90	16			
5		… LOOSE SILTY SAND: Dark olive brown; fine grained; moist.	■		13			100	23			
		∇										
10		No Recovery.	■		8							
15		No Recovery.	☒		8							
		End Of Boring.										
20												
25												

Completion Depth: **16.5**
Date Started: **5/19/11**
Date Completed: **5/19/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Mobile-60 w/8" Hollow Stem Auger

Remarks: Boring terminated at 16.5 feet. Boring backfilled with soil cuttings. Groundwater encountered at 7 feet.

APPENDIX B

Laboratory Testing Results

APPENDIX B

LABORATORY TESTING

Moisture-Density Tests

The field moisture content, as a percentage of dry weight of the soils, was determined by weighing the samples before and after oven drying in accordance with ASTM D 2216 test procedures. Dry densities, in pounds per cubic foot, were also determined for undisturbed core samples in general accordance with ASTM D 2937 test procedures. Test results are presented on the boring logs in Appendix A.

Direct Shear Test

Two direct shear tests were performed on in-situ soil samples from selected boring. The tests were conducted to determine the soil strength characteristics. The standard test method is ASTM D 3080, Direct Shear Test for Soil under Consolidated Drained Conditions. The results of the direct shear test results are presented graphically on Figures B-1 and B-2.

Consolidation Test

Two consolidation tests were performed on relatively undisturbed soil sample to evaluate compressibility and collapse potential characteristics. The test was performed in general accordance with ASTM D 2435. The sample was initially loaded under as-received moisture content to a selected stress level, was then saturated, and then incrementally loaded up to a maximum load of 5200 psf. The test results are presented on Figures B-3 and B-4.

Expansion Index Test

One Expansion Index Test was performed on a bulk soil sample in an area beneath planned building slab or foundations. The test was performed in general accordance with UBC Standard 18-1. The results of the test are presented on Figure B-5.

Soil Corrosivity

The results of chemical analyses performed on a selected soil sample using EPA Test Methods 300.0 (for soluble sulfate and chlorides) and 9045C (for pH) are presented below.

Table B-1: Summary of Corrosion Test Results

Sample Location	B-5 @ 0' – 5' bgs
pH	8
Sulfate, ppm	250
Chloride, ppm	100

Minus #200 Sieve Analysis

The fines content (amount of silt and clay) of four soil samples was evaluated by performing minus #200 sieve analysis in accordance with ASTM D 1140 test procedures. The results of these tests are presented in Table B-2.

Table B-2: Summary of Minus #200 Sieve Wash Test Results	
Location	Percentage Passing
B-05 @ 5 feet bgs	43
B-06 @ 10 feet bgs	70
B-07 @ 15 feet bgs	42
B-08 @ 2 feet bgs	56

Maximum Density and Optimum Moisture Content

One (1) bulk sample was tested in accordance with the Modified Proctor Method (ASTM D 1557) to determine the maximum dry density and optimum moisture content. The results of the tests are presented on Figure B-6. The maximum dry density was used to evaluate the relative compaction of the existing building pad based on in-place density tests. The results of these tests are presented in Table B-3.

Table B-3: Relative Compaction of Existing Building Pad			
Location	Dry Density (lb/ft^3)	Maximum Dry Density (lb/ft^3)	Relative Compaction (%)
B-01 @ 2 feet bgs	116	127	91
B-01 @ 4 feet bgs	114	127	90
B-02 @ 2 feet bgs	103	127	81
B-02 @ 4 feet bgs	103	127	81
B-03 @ 2 feet bgs	118	127	93
B-03 @ 4 feet bgs	105	127	83
B-04 @ 2 feet bgs	100	127	79
B-04 @ 4 feet bgs	107	127	84

BSK PROJECT:	WHC, Lemoore Student Center	June 2011
PROJECT NUMBER:	G1100311B	
SAMPLE ID:	B-06 @ 5 feet bgs	
DRY DENSITY (pcf):	112	
MOISTURE CONTENT (%):	19	
INTERNAL FRICTION ANGLE, φ (degrees)	32	
COHESION, c (ksf):	0.40	

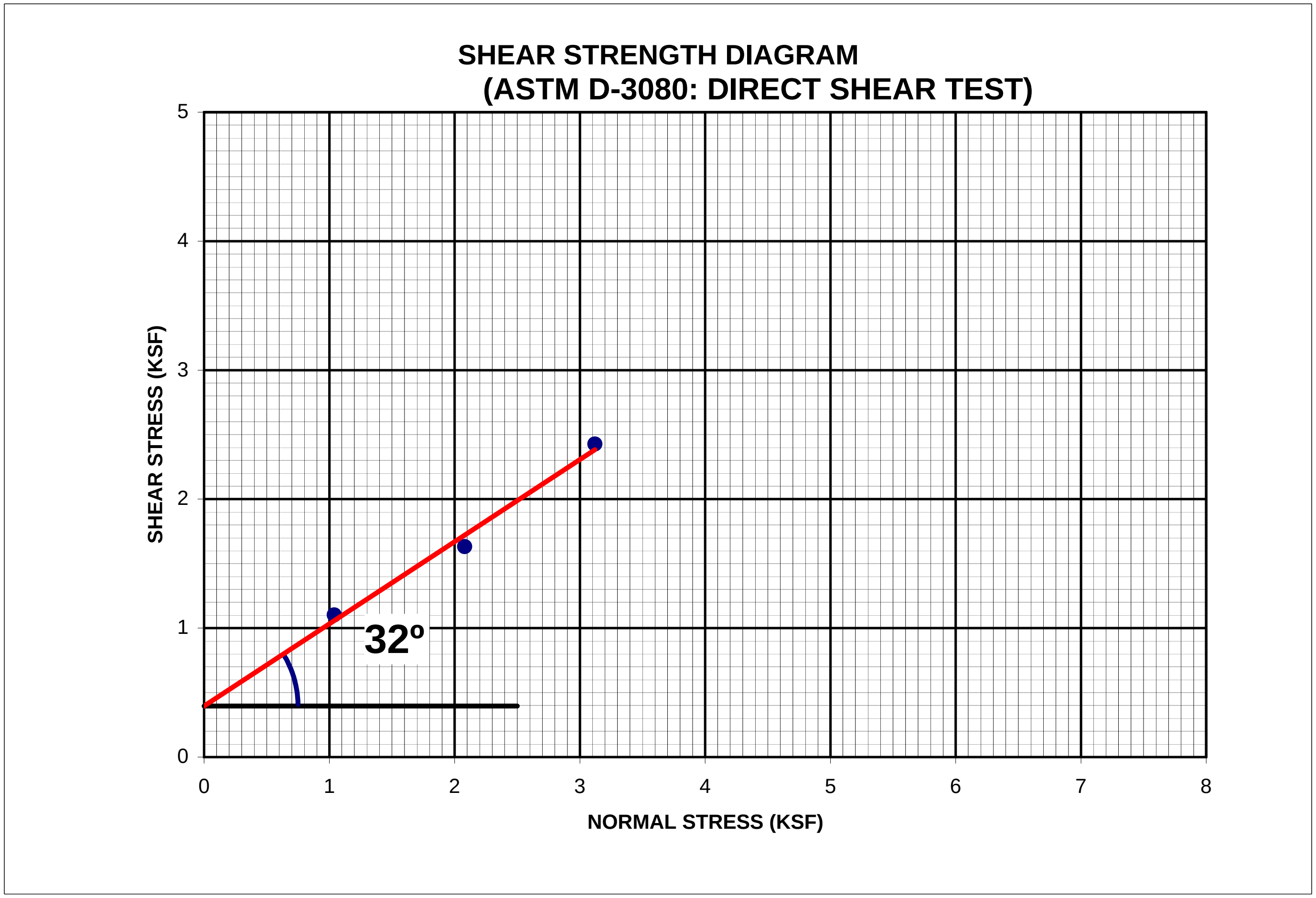

Figure B-1

BSK PROJECT:	WHC, Lemoore Student Center	June 2011
PROJECT NUMBER:	G1100311B	
SAMPLE ID:	B-08 @ 5 feet bgs	
DRY DENSITY (pcf):	100	
MOISTURE CONTENT (%):	23	
INTERNAL FRICTION ANGLE, φ (degrees)	35	
COHESION, c (ksf):	0.33	

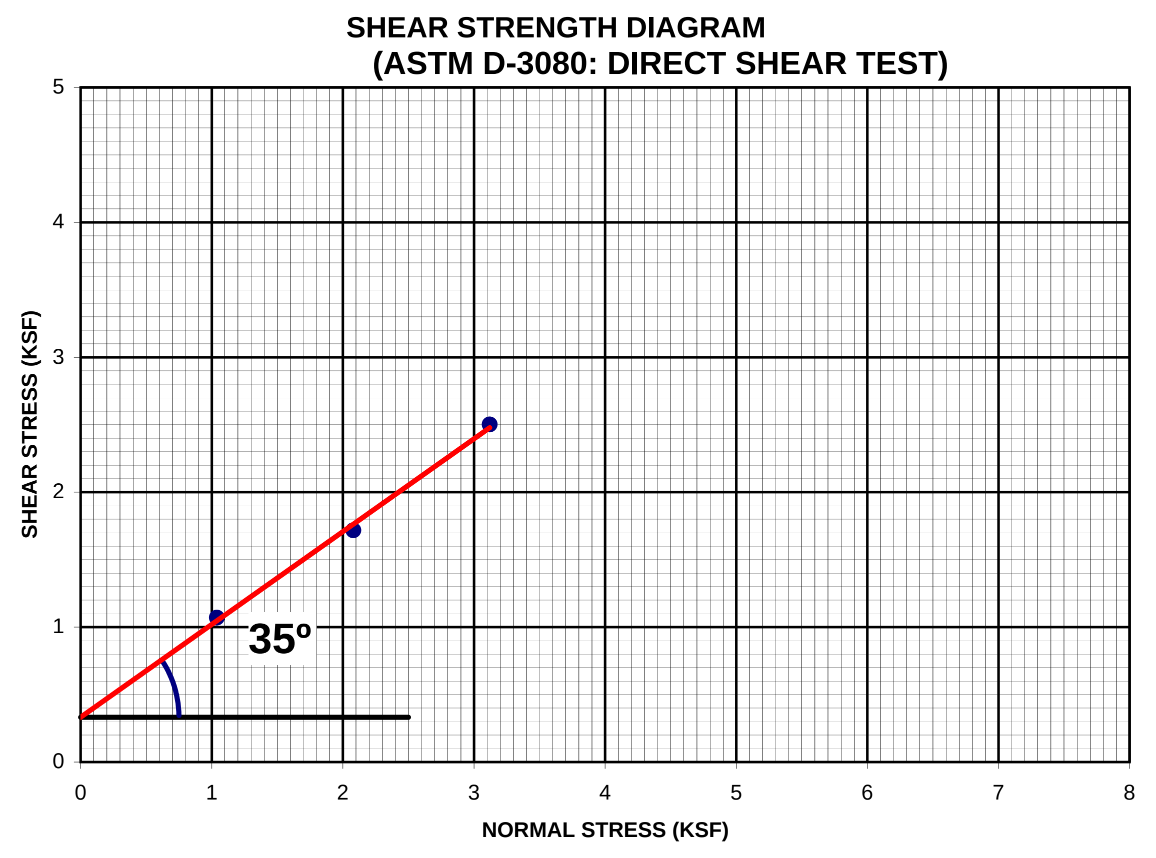

Figure B-2

BSK

BSK PROJECT:	WHC, Lemoore Student Center	June 2011
PROJECT NUMBER:	G1100311B	
SAMPLE ID:	B-05 @ 5 feet bgs	
DRY DENSITY (pcf):	113	
INITIAL MOISTURE CONTENT (%):	18	
COLLAPSE POTENTIAL:	0% AT 1300 PSF LOAD	

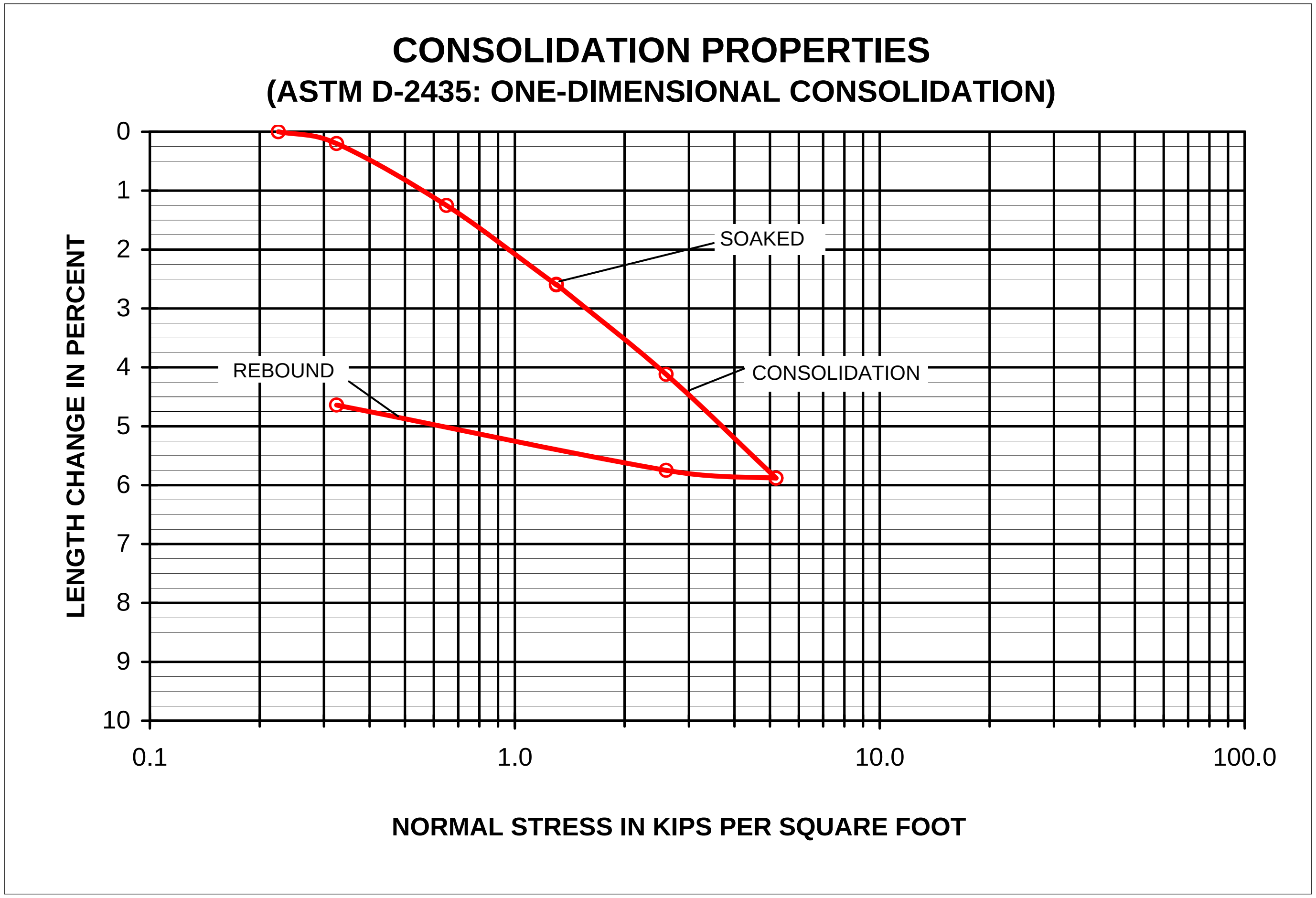

Figure B-3

BSK PROJECT:	WHC, Lemoore Student Center	June 2011
PROJECT NUMBER:	G1100311B	
SAMPLE ID:	B-07 @ 5 feet bgs	
DRY DENSITY (pcf):	111	
INITIAL MOISTURE CONTENT (%):	18	
COLLAPSE POTENTIAL:	0% AT 1300 PSF LOAD	

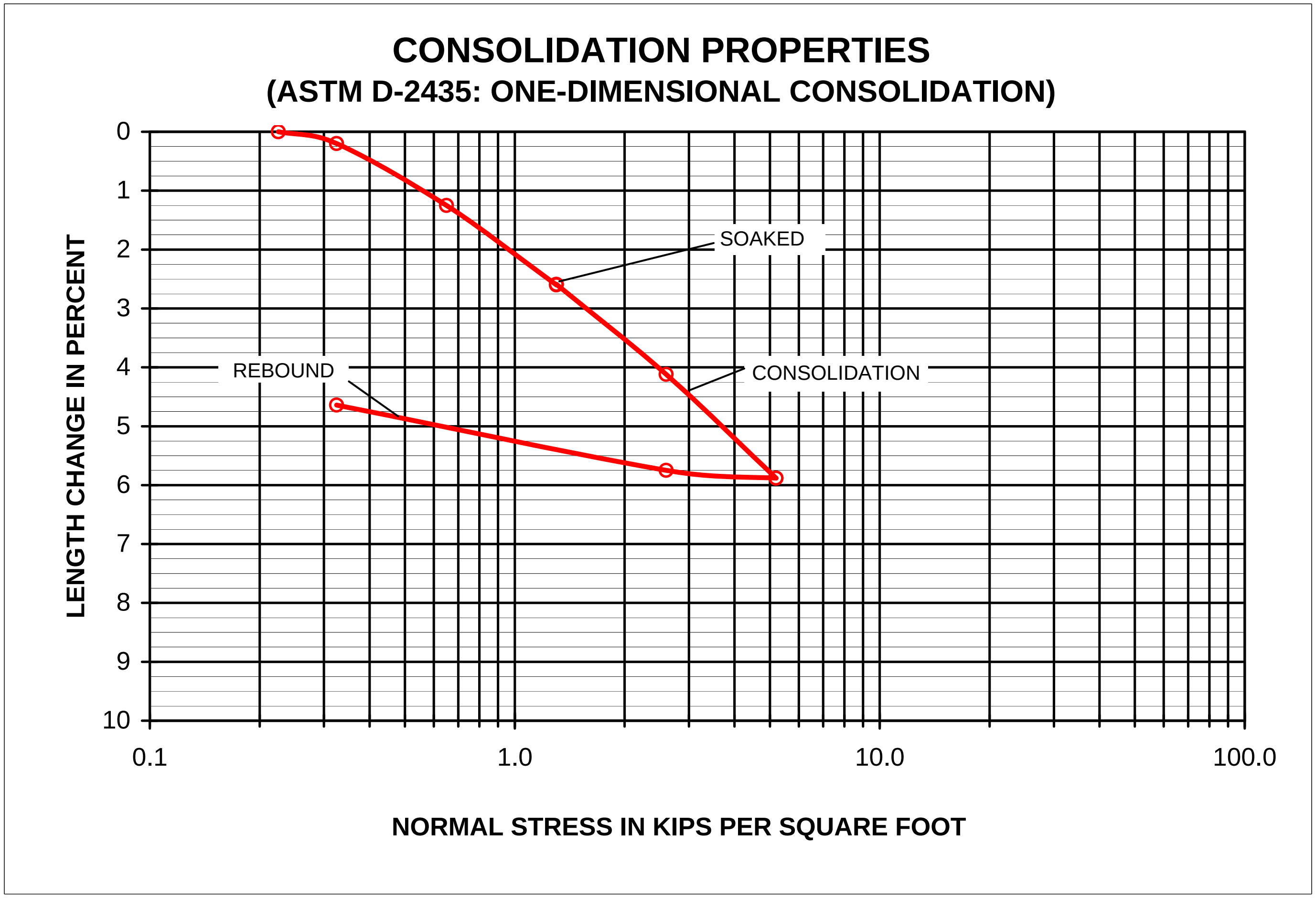

Figure B-4

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Fax: (661) 324-4218

EXPANSION INDEX OF SOILS

ASTM D 4829 / UBC STANDARD 18-2

Project Name: WHC, Lemoore Student Center
Project Number: G11-003-11B **Sample Date:** 5/19/2011
Lab Tracking ID: **Test Date:** 5/27/2011
Sample Location: B-05 @ 0-5'
Sample Source Native
Sampled By: K. Schwartz **Tested By:** N. Rossiter **Reviewed By:** On Man Lau

TEST DATA

INITIAL SET-UP DATA		**FINAL TAKE-DOWN DATA**	
Sample + Tare Weight (g)	681.3	Sample + Tare Weight (g)	203.0
Tare Weight (g)	283.7	Tare Weight (g)	0.0
Moisture Content Data		**Moisture Content Data**	
Wet Weight + Tare	402.7	Wet Weight + Tare	203.0
Dry Weight + Tare	366.8	Dry Weight + Tare	184.1
Tare Weight (g)	0	Tare Weight (g)	0.0
Moisture Content (%)	9.8%	Moisture Content (%)	10.3%
Initial Volume (ft^3)	0.007272	Final Volume (ft^3)	0.007878
Remolded Wet Density (pcf)	120.5	Final Wet Density (pcf)	56.8
Remolded Dry Density (pcf)	109.8	Final Dry Density (pcf)	51.5
Degree of Saturation	**49**	**Degree of Saturation**	**12**

EXPANSION READINGS

Initial Gauge Reading (in)	0.0233
Final Gauge Reading (in)	0.1066
Expansion (in)	0.0833

Uncorrected Expansion Index	**83**
Corrected Expansion Index, EI	**83**

Classification of Expansive Soil

EI	Potential Expansion
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
>130	Very High

Remarks: The material has medium expansion potential.

BSK PROJECT:	WHC Lemoore Student Center	June 2011
PROJECT NUMBER:	G1100311B	
SAMPLE ID:	B-05 @ 0-5'	
MAXIMUM DRY DENSITY (pcf):	127	
OPTIMUM MOISTURE CONTENT (%):	10	
TEST DESIGNATION:	ASTM D1557	

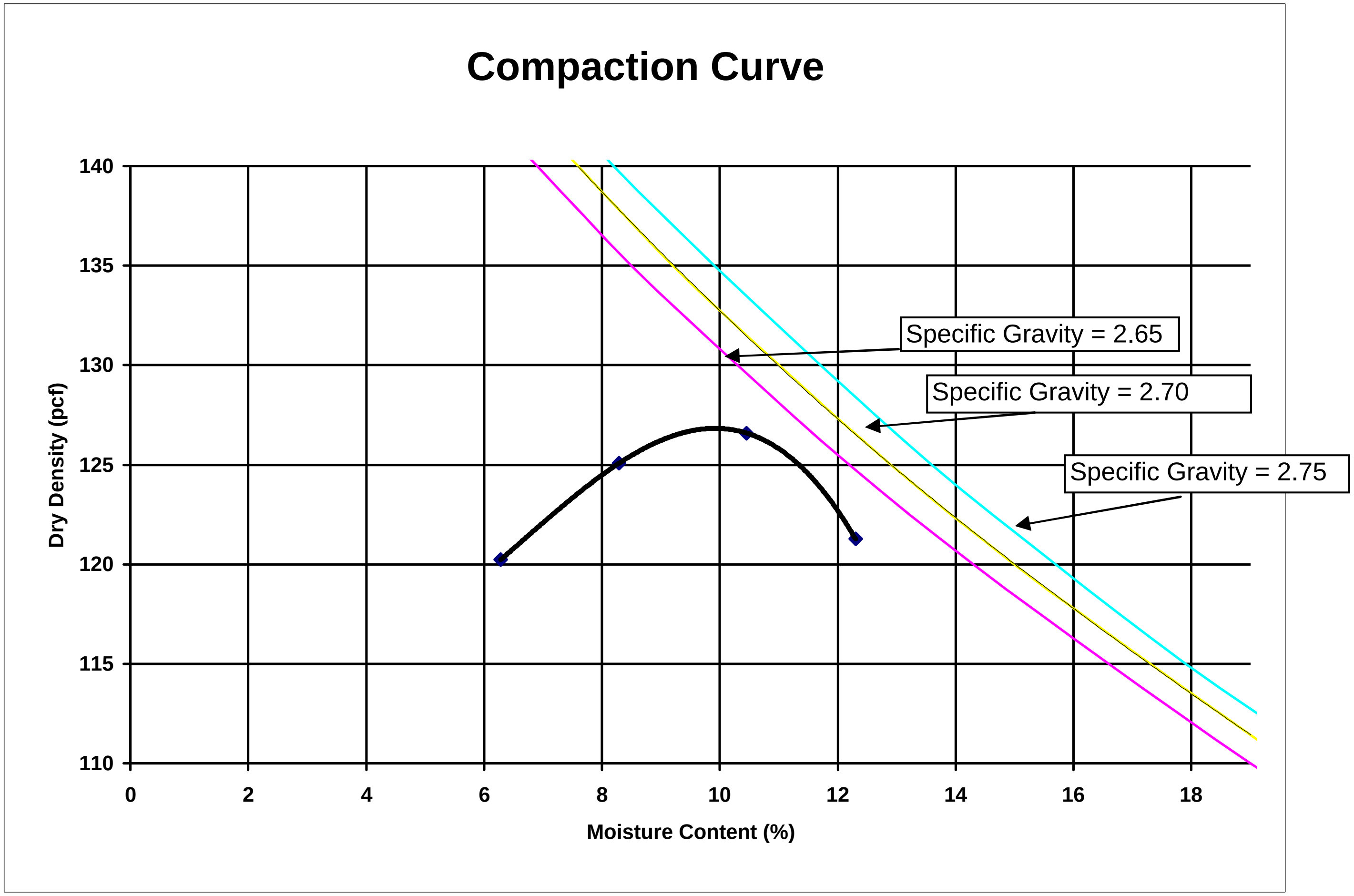

Figure B-6

BSK

APPENDIX C

Geologic and Seismic Hazards Investigation

Appendix C

Geologic/Seismic Hazard Investigation
Lemoore Student Center
West Hills College
Lemoore, California

BSK JOB G1100311B

June 6, 2011

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GEOLOGIC/SEISMIC HAZARD INVESTIGATION
LEMOORE STUDENT CENTER
WEST HILLS COLLEGE
LEMOORE, CALIFORNIA

C1.0 INTRODUCTION

This report presents the geologic and seismic hazards evaluation prepared in accordance with 2010 California Building Code (CBC), CCR Title 24, Chapters 16 and 18 requirements for a Geotechnical/Engineering Geologic Report. The evaluation was performed in conformance with California Geologic Survey Note 48(January 2010).

C1.1 Objective and Scope of Services

The objective of the geologic and seismic hazards assessment is to provide the Client with an evaluation of potential geologic or seismic hazards which may be present at the site or due to regional influences. BSK's scope of services for this assessment included the following: a review of published geologic literature; an evaluation of the data collected; determination of site class and seismic design parameters; liquefaction and seismic settlement analyses.

C1.2 Site Location

The school is located in the City of Lemoore in the north western portion of Kings County, California. The school site coordinates are:

Latitude 36.29219ºN

Longitude 119.82608ºW

As shown on Figure C1, the site is located at the southeast corner of the southwest corner of Bush Street and College Avenue in Lemoore, California.

C1.3 Site Topography

As shown on Figure C1, Topographic map, the site and surrounding area topography is relatively flat with a ground surface elevation between 210 feet and 215 feet, USGS datum.

C1.4 Groundwater Conditions

The Site is within the Tulare Lake sub-basin of the San Joaquin Basin Hydrologic Study Area. This includes approximately the southern two-thirds of the Great Valley. Within the Study Area, 39 groundwater basins and areas of potential storage have been identified. The boundaries of these areas are based largely on hydrologic as well as political considerations.

At the time of our field exploration between May 12 and May 19, 2011, groundwater was encountered at a depth of approximately 7 feet below ground surface in our soil borings. To ascertain groundwater levels for the area during other time periods, groundwater elevation data from the California Department of Water Resources (DWR) were obtained for the period 1950 to 2007. Water level hydrographs from wells in the vicinity Site are presented on figure C2. The hydrographs indicate that, in the vicinity of the Site, the historical shallowest depth to groundwater varies from 60 feet to 6 feet bgs. For analysis a conservative assumed depth to groundwater, based on the historical depth of 6 feet bgs was used.

C2.0 GEOLOGIC SETTING

The site is located in the Great Valley geomorphic province. The Site is located in the structural region identified by Bartow, 1991 as the San Joaquin Valley portion of the southern Sierran block. This area forms a broad syncline with deposits of marine and overlying continental sediments, Jurassic to Holocene in age. The thickness of the sediments increases to the west and reach a thickness of as much as 20,000 feet on the west side of the San Joaquin Valley syncline.

As shown on Figure C3, the Site is situated on recent basin deposits which were deposited from the Kings River.

C2.1 Subsurface Soil Conditions

The soils encountered during our subsurface exploration consisted of silty sands, silty clays, clayey silts, and sandy silts. Based on the hand auguring soil boring data, the existing building pad consists primarily of silty sand. Based on hollow stem auger borings and CPT soundings, the native soil consists primarily of silty clays and clayey silts in the upper 10 feet. The soil below 10 feet is layered sand and silt with some silty clay. The maximum explored depth was 50 feet. Soil boring logs are included in Appendix A.

C3.0 GEOLOGIC/SEISMIC HAZARDS

The types of geologic and seismic hazards assessed include surface ground fault rupture, liquefaction, seismically-induced settlement, slope failure, flood hazards and inundation hazards.

C3.1 Fault Rupture Hazard Zones in California

The purpose of the Alquist-Priolo Geologic Hazards Zones Act, as summarized in CDMG Special Publication 42 (SP 42), is to "prohibit the location of most structures for human occupancy across the traces of active faults and to mitigate thereby the hazard of fault-rupture." As indicated by SP 42, "the State Geologist is required to delineate "earthquake fault zones" (EFZs) along known active faults in California. Cities and counties affected by the zones must regulate certain development 'projects' within the zones. They must withhold development permits for sites within the zones until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting.

The Site is not located in a Fault-Rupture Hazard Zone. As shown on Figure 4, the closest Fault-Rupture Hazard Zone is associated with the Nunez Fault located approximately 35 miles west of the Site.

C3.2 State of California Seismic Hazard Zones (Liquefaction and Landslides)

The Site is not currently located in a Seismic Hazard Zone specified by State of California.

C3.3 Slope Stability and Potential for Slope Failure

The site and surrounding areas are essentially flat and the potential hazard due to landslides from adjacent properties is not applicable.

C3.4 Flood and Inundation Hazards

An evaluation of flooding at the site includes review of potential hazards from flooding during periods of heavy precipitation and flooding due to a catastrophic dam breach from up-gradient surface impoundments.

Flood Hazards

Flood Insurance Rates Maps (FIRM) published by the Federal Emergency Management Agency (FEMA) were reviewed to obtain information regarding the potential for flooding at the Site. According to the June 16, 2009 FIRM Map #06031C0165C, the Site lies in Zone A inside the 100-year Special Flood Hazard Area.

Inundation Hazards – Dams

According to the GIS data obtained from California Emergency Management Agency, the Site is located in the pathway of inundation from a catastrophic breach of Pine Flat Dam. According to the 1993 Kings County General Plan, if the Pine Flat Dam failed while at full capacity, its floodwaters would arrive in Kings County within approximately five hours.

C3.5 Volcanic Hazards

According to USGS Bulletin 1847, dated 1989, the site is not located in an area which would be subject to hazards from volcanic eruptions.

C3.6 Land Subsidence

Land subsidence in California generally occurs in areas of fluid removal (petroleum and groundwater) and in arid areas due to hydrocompaction of loose near surface soils.

The Site is not located in an area susceptible to subsidence due to petroleum or groundwater withdrawal. The Site is not located in an area which soils are known to be impacted by hydrocompaction.

C4.0 SEISMIC HAZARD ASSESSMENT

C4.1 Seismic Source Deaggregation

Figure C4 presents a regional fault map showing the major fault which may impact the Site. The probabilistic value of ground motion at a site can be caused by earthquakes on any of the sources surrounding the site. Deaggregation of the seismic hazard was performed by using the USGS Interactive Deaggregation website. The deaggregation at the MCE hazard level results in distance, magnitude and epsilon (round-motion uncertainty) for each source which contributes to the hazard. Each source has a corresponding epsilon which is the probabilistic value relative to the mean value of ground motion for that source.

Table C1 lists the result of deaggregation at the MCE hazard level from the USGS website. The most significant source that contributes to the PGA is the nearby Great Valley 14 Fault. With an epsilon value of 1.4 and a Magnitude 7.1, this source would approximate the most extreme design level event. For liquefaction and seismic settlement, a magnitude (Mw) of 7.1 would be appropriate for input parameters which are consistent with the design earthquake ground motion.

C4.2 Historical Seismicity

Table C2 provide the location, earthquake magnitude, Site to earthquake distances, dates and the resulting Site peak horizontal acceleration for the period 1800 to 1999. . The table shows that the Site has experienced mean plus one sigma peak horizontal acceleration up to 0.18g from the Coalinga Earthquake of 1983. In general, the site has been subjected to relatively low intensity ground motion, primarily from large earthquakes on distance faults and low magnitude earthquakes closer to the site. Figure C5 presents historical earthquake magnitude and locations relative to the Site.

C4.3 Earthquake Ground Motion

C4.3.1 Site Class

Based on the equivalent "N" values converted from the CPT test holes completed in May 2011, as per Table 1613.5.2 of 2010 CBC, the Site is Class D ($15 \leq N \leq 50$).

C4.3.2 2010 California Building Code

The earthquake hazard level of the maximum considered earthquake (MCE) is define in ASFE 7-05 as the ground motion resulting from a seismic source(s) having a probability of exceedance of 2% in 50 years. The United States Geologic Survey (USGS) has prepared maps presenting the MCE spectral acceleration (5% damping) for periods of 0.2 seconds (S_S) and 1.0 seconds (S_1). The values of S_S and S_1 can be obtained from the USGS Ground Motion Parameter Calculator available at: http://earthquake.usgs.gov/research/hazmaps/design/index.php.

The USGS Ground Motion Parameter Calculator and Chapter 16 of 2010 CBC produced the following values based on Site Class D conditions:

TABLE A
SPECTRAL ACCELERATION PARAMETERS

Criteria	**Value**		**Reference**
MCE Mapped Spectral Acceleration (g)	$S_S = 0.81$	$S_1 = 0.31$	USGS Mapped Value
Amplification Factors (Site Class D)	Fa = 1.18	Fv = 1.78	Table 1613.5.3
Site Adjusted MCE Spectral Acceleration (g)	$S_{MS} = 0.95$	$S_{M1} = 0.55$	Equations 16-37, 38
Design Spectral Acceleration (g)	$S_{DS} = 0.63$	$S_{D1} = 0.37$	Equations 16-39, 40
Design Peak Ground Acceleration (S_{DS} /2.5) (g)	PGA = 0.25		CGS Note 48

C4.3.3 Seismic Design Category

S_{D1} is greater than 0.20g, therefore the site is Seismic Design Category D (Table 1613.5.6(2), 2010 CBC)

C4.4 Liquefaction

Liquefaction describes a condition in which a saturated, cohesionless soil loses shear strength during earthquake shocks. Ground motion from an earthquake may induce cyclic reversals of shearing strains of large amplitude. Lateral and vertical movements of the soil mass, combined with loss of bearing strength, usually result from this phenomenon. Historically, liquefaction of soils has caused severe damage to structures, berms, levees and roads. Seed and Idriss (1971) demonstrated that liquefaction potential depends on soil type, void ratio, depth to groundwater, duration of shaking and confining pressures over the potentially liquefiable soil mass. Fine, well sorted, loose sand, shallow groundwater, severe seismic ground motion and particularly long durations of ground shaking are conditions conducive for liquefaction.

In order to evaluate the liquefaction potential and quantify the effects of liquefaction, a liquefaction and seismic settlement analysis based upon the Simple Cyclic Stress Ratio and CPT data using the computer program "Cliq," was performed. The program uses a method which is consistent with the 1998 NCEER/NSF Workshop on Evaluation of Liquefaction Resistance of Soils. The program CLiq provides consistent output results by applying the state-of-the-art NCEER method (Youd et al, 2001) along with the calibrated procedures for post-earthquake displacements by Zhang et al (2002 & 2004).

Input parameters for the liquefaction and settlement analysis were based upon:
CPT Data from each of the four CPT test holes.
PGA based upon the design event of 0.25g.
Magnitude 7.1 of controlling earthquake.
Assumed depth to groundwater of 6 feet bgs.
Clay-like behavior was assumed for units with an Ic above 2.60.

Data sheets and input parameters for each of the liquefaction analysis are provided in herein.

Our analysis indicates that during the design event, the factor of safety against liquefaction is less than a value of 1.0 (acceptable for most structures) in some minor subsurface units. Based on the limited thickness of the potential liquefiable units (less than two feet), the overall potential for significant liquefaction to occur at the Site is low.

C4.5 Seismically-Induced Settlement

Settlement of the ground surface with consequential differential movement of structures is a major cause of seismic damage for buildings founded on alluvial deposits. Vibration settlement of relatively dry and loose granular deposits beneath structures can be readily induced by the horizontal components of ground shaking associated with even moderate intensity earthquakes. Silver and Seed (1971) have demonstrated that settlement of dry sands due to cyclic loading is a function of 1) the relative density of the soil; 2) the magnitude of the cyclic shear stress; and 3) the number of strain cycles. As indicated above, seismically-induced ground settlement can also occur due to the liquefaction of relatively loose, saturated granular deposits.

Seismically induced ground settlement of the saturated portion of the sandy soils based on our analysis is estimated to range from 1.0 inches to 1.4 inches. Differential seismically induced settlement is estimated to be about 0.4 inches across a horizontal distance of 100 feet.

Based on the ratio of the thickness of liquefiable units compared to non-liquefiable over-lying units using the method of Ishihara, 1985, sand boils or surface manifestations of liquefaction are not anticipated.

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TABLES

TABLE C1
SEISMIC HAZARD DEAGGREGATION
MAXIMUM CONSIDERD EARTHQUAKE

Seismic Source	Percent Contribution	Distance (km)	Magnitude (Mw)	Epsilon (Mean Values)
PGA Deaggregation				
CA Compr. crustal gridded	76.7	10.0	5.9	0.8
Great Valley 14 (Kettleman Hills)	6.1	31.9	7.1	1.4
Great Valley 13 (Coalinga) Char	6.4	31.6	7.0	1.5
Great Valley 14 (Kettleman Hil G)	3.5	31.9	6.9	1.7
Great Valley 13 (Coalinga) GR	3.4	32.0	6.8	1.7

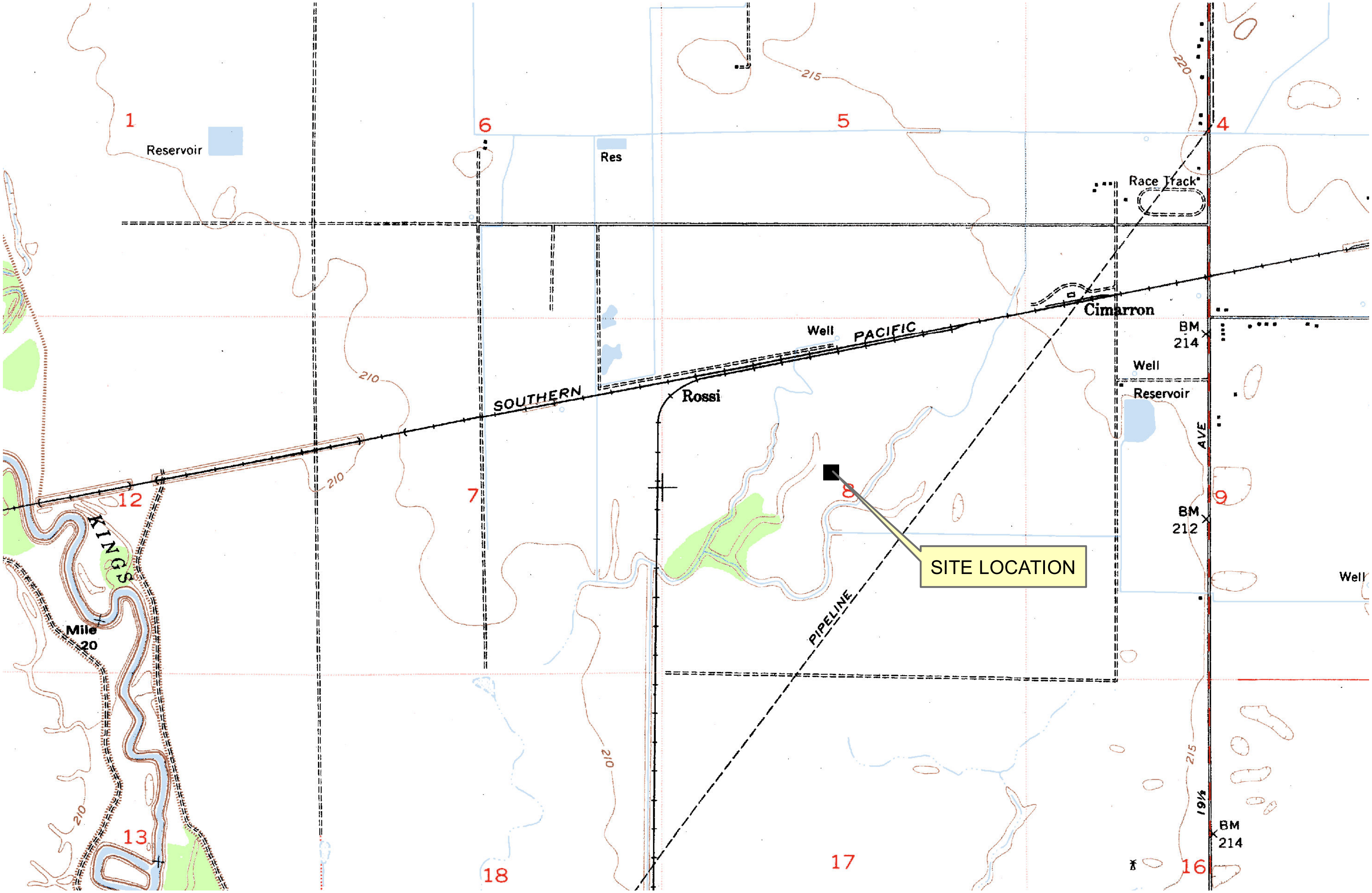
TABLE C2
Historic Earthquakes Within 100 Miles of the Site
Ground Motion Greater Than 0.05g

File Code	Latitude (North)	Longitute (West)	Date	Depth (km)	Earthquake Magnitude	Site Acceleration (g)	Distance mi (km)
BRK	36.22	120.29	5/2/1983	0	6.7	0.18	26.3 (42.3)
PAS	36.151	120.049	8/4/1985	6	5.8	0.17	15.8 (25.4)
DMG	35.3	119.8	01/09/1857	0	7.9	0.16	68.5 (110.3)
DMG	36.7	118.1	03/26/1872	0	7.8	0.12	99.9 (160.7)
DMG	35.75	120.25	3/10/1922	0	6.5	0.11	44.3 (71.3)
BRK	36.22	120.4	7/22/1983	0	6.0	0.11	32.3 (52.0)
BRK	36.22	120.29	5/2/1983	0	5.6	0.10	26.3 (42.3)
BRK	36.22	120.26	9/9/1983	0	5.4	0.10	24.7 (39.7)
PAS	36.286	120.413	10/25/1982	6	5.6	0.09	32.7 (52.6)
DMG	35.8	120.33	6/8/1934	0	6.0	0.08	44.1 (71.0)
BRK	36.24	120.29	5/9/1983	0	5.2	0.08	26.1 (42.0)
PAS	36.131	119.997	8/5/1985	6	4.3	0.08	14.6 (23.6)
BRK	36.11	120.16	1/14/1976	0	4.9	0.08	22.5 (36.1)
PAS	36.182	120.268	2/14/1987	6	5.1	0.08	25.8 (41.4)
BRK	36.26	120.4	7/9/1983	0	5.3	0.08	32.0 (51.5)
PAS	36.145	120.052	8/4/1985	6	4.3	0.07	16.2 (26.0)
PAS	36.22	120.136	9/24/1980	6.7	4.4	0.07	18.0 (28.9)
PAS	36.119	119.989	8/4/1985	6	4.1	0.07	15.0 (24.2)
PAS	36.052	119.978	8/4/1985	6	4.4	0.07	18.6 (30.0)
DMG	35.98	120.04	9/19/1965	0	4.8	0.07	24.6 (39.6)
DMG	36	120.5	02/02/1881	0	5.6	0.07	42.6 (68.6)
DMG	36.17	120.32	12/27/1926	0	5.0	0.07	28.8 (46.3)
DMG	36.4	121	04/12/1885	0	6.2	0.07	65.7 (105.7)
T-A	36.17	119.32	07/25/1868	0	5.0	0.07	29.4 (47.3)
BRK	36.21	120.38	7/25/1983	0	5.1	0.07	31.4 (50.5)
PAS	36.062	120.163	1/14/1976	7	4.7	0.07	24.6 (39.6)
BRK	36.25	120.29	5/3/1983	0	4.8	0.07	26.0 (41.8)
DMG	36	120.5	3/3/1901	0	5.5	0.07	42.6 (68.6)
DMG	35.95	120.5	6/28/1966	0	5.5	0.06	44.4 (71.4)
BRK	36.13	120.19	5/3/1983	0	4.5	0.06	23.2 (37.3)
BRK	36.27	120.33	5/3/1983	0	4.8	0.06	28.1 (45.2)
BRK	36.2	120.4	7/22/1983	0	5.0	0.06	32.6 (52.4)
GSB	36.003	119.916	9/16/1992	11	4.3	0.06	20.6 (33.1)
BRK	36.46	120.34	8/3/1975	0	4.9	0.06	30.8 (49.6)
PAS	36.027	120.056	8/7/1985	6	4.4	0.06	22.3 (36.0)
BRK	36.25	120.47	6/11/1983	0	5.1	0.06	36.0 (57.9)
PAS	36.25	120.267	5/3/1983	9	4.5	0.06	24.7 (39.8)
BRK	36.26	120.33	5/4/1983	0	4.7	0.06	28.1 (45.3)
BRK	36.25	120.31	5/24/1983	0	4.6	0.06	27.1 (43.6)
BRK	36.18	120.12	8/12/1983	0	4.0	0.06	18.1 (29.1)
BRK	36.15	120.25	5/12/1983	0	4.5	0.06	25.6 (41.1)
DMG	36.9	118.2	03/26/1872	0	6.5	0.06	99.4 (160.0)
BRK	36.13	120.25	5/3/1983	0	4.5	0.06	26.1 (42.1)
BRK	36.25	120.28	5/3/1983	0	4.4	0.06	25.4 (40.9)
BRK	36.28	120.36	5/5/1983	0	4.6	0.06	29.7 (47.8)
DMG	35.383	118.85	7/29/1952	0	6.1	0.05	83.2 (133.9)
PAS	36.205	120.176	5/3/1983	9	4.0	0.05	20.4 (32.8)
GSB	36.007	119.94	9/27/1992	13	4.0	0.05	20.7 (33.3)
BRK	36.1	120.18	5/3/1983	0	4.2	0.05	23.8 (38.2)
PAS	36.091	120.208	8/4/1985	6	4.3	0.05	25.4 (40.9)
BRK	36.22	120.3	5/9/1983	0	4.4	0.05	26.8 (43.2)

TABLE C2
Historic Earthquakes Within 100 Miles of the Site
Ground Motion Greater Than 0.05g

File Code	Latitude (North)	Longitute (West)	Date	Depth (km)	Earthquake Magnitude	Site Acceleration (g)	Distance mi (km)
DMG	35.97	120.5	6/28/1966	0	5.1	0.05	43.7 (70.3)
PAS	37.464	118.823	5/27/1980	2.4	6.3	0.05	98.1 (157.8)
PAS	36.177	120.175	5/3/1983	5	4.0	0.05	21.0 (33.8)
USG	36.154	120.232	5/2/1983	8.6	4.2	0.05	24.5 (39.5)
GSP	36.181	120.301	3/31/1994	10	4.4	0.05	27.5 (44.3)
PAS	36.219	120.264	5/8/1984	15.3	4.2	0.05	24.9 (40.1)
PAS	36.274	120.331	2/19/1984	7.4	4.4	0.05	28.1 (45.3)
DMG	35.95	120.47	11/16/1956	0	5.0	0.05	43.0 (69.2)
BRK	36.07	120.19	12/21/1983	0	4.2	0.05	25.4 (40.9)
GSB	35.917	120.465	12/20/1994	8	5.0	0.05	44.1 (70.9)
DMG	35.8	120.33	6/5/1934	0	5.0	0.05	44.1 (71.0)
DMG	35.8	120.33	12/28/1939	0	5.0	0.05	44.1 (71.0)
DMG	35.8	120.33	6/8/1934	0	5.0	0.05	44.1 (71.0)
DMG	35.93	120.48	12/24/1934	0	5.0	0.05	44.2 (71.2)
DMG	35.73	121.2	11/22/1952	0	6.0	0.05	86.0 (138.4)

FIGURES



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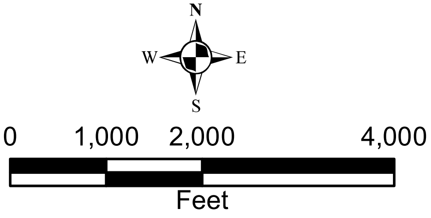
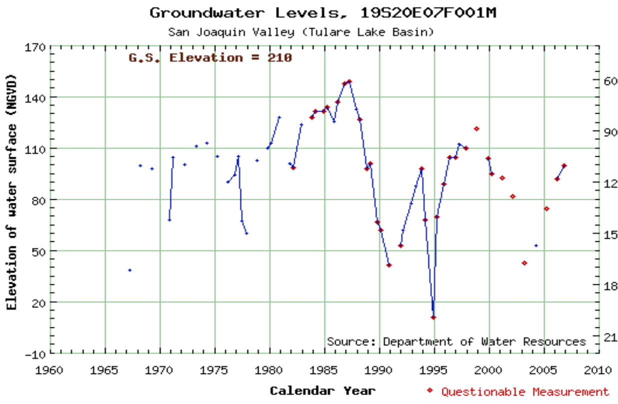
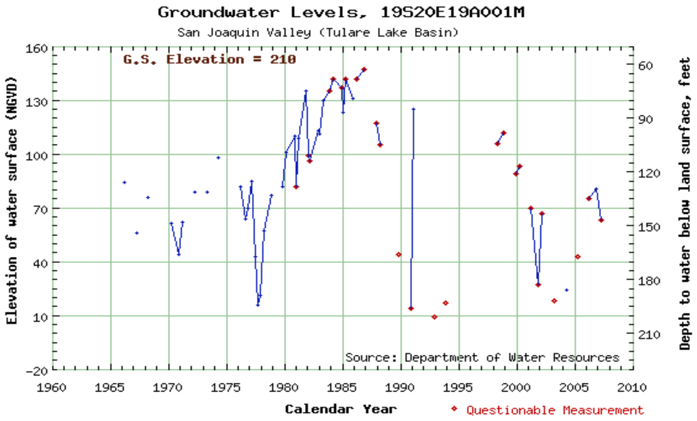


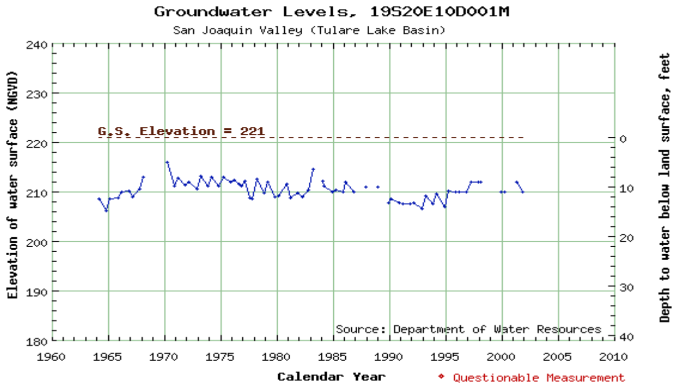
BSK
Associates
Engineers & Laboratories

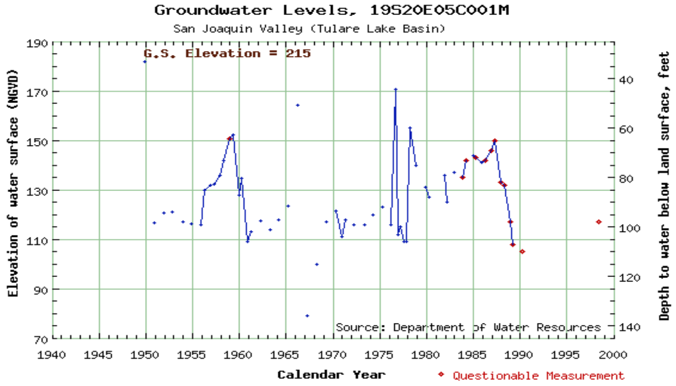
Geologic/Seismic Hazard Evaluation
Lemoore Student Center
West Hills College
Lemoore, California

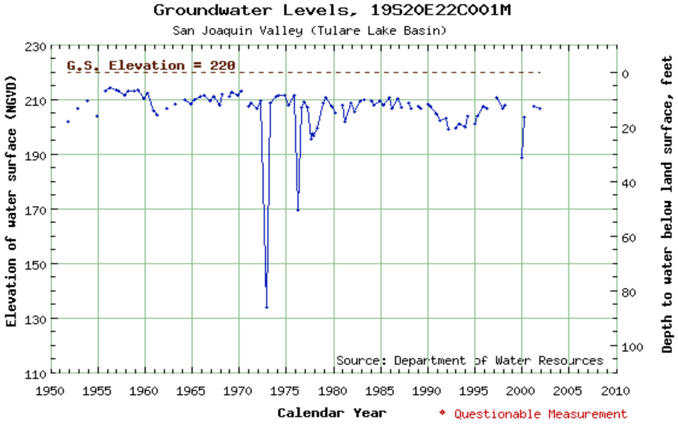
Figure C1
Vicinity Map
BSK Project G1100311B

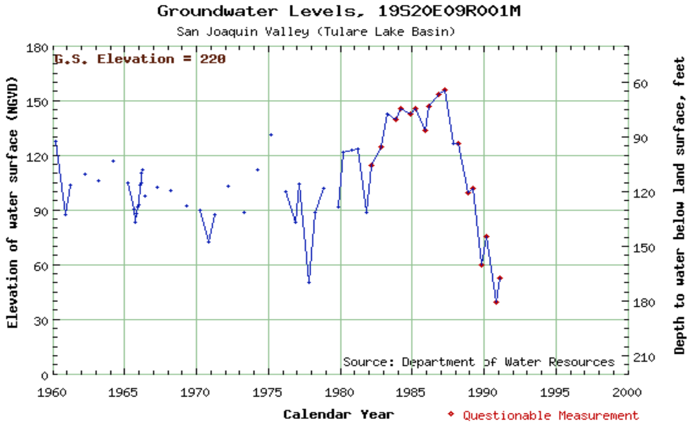












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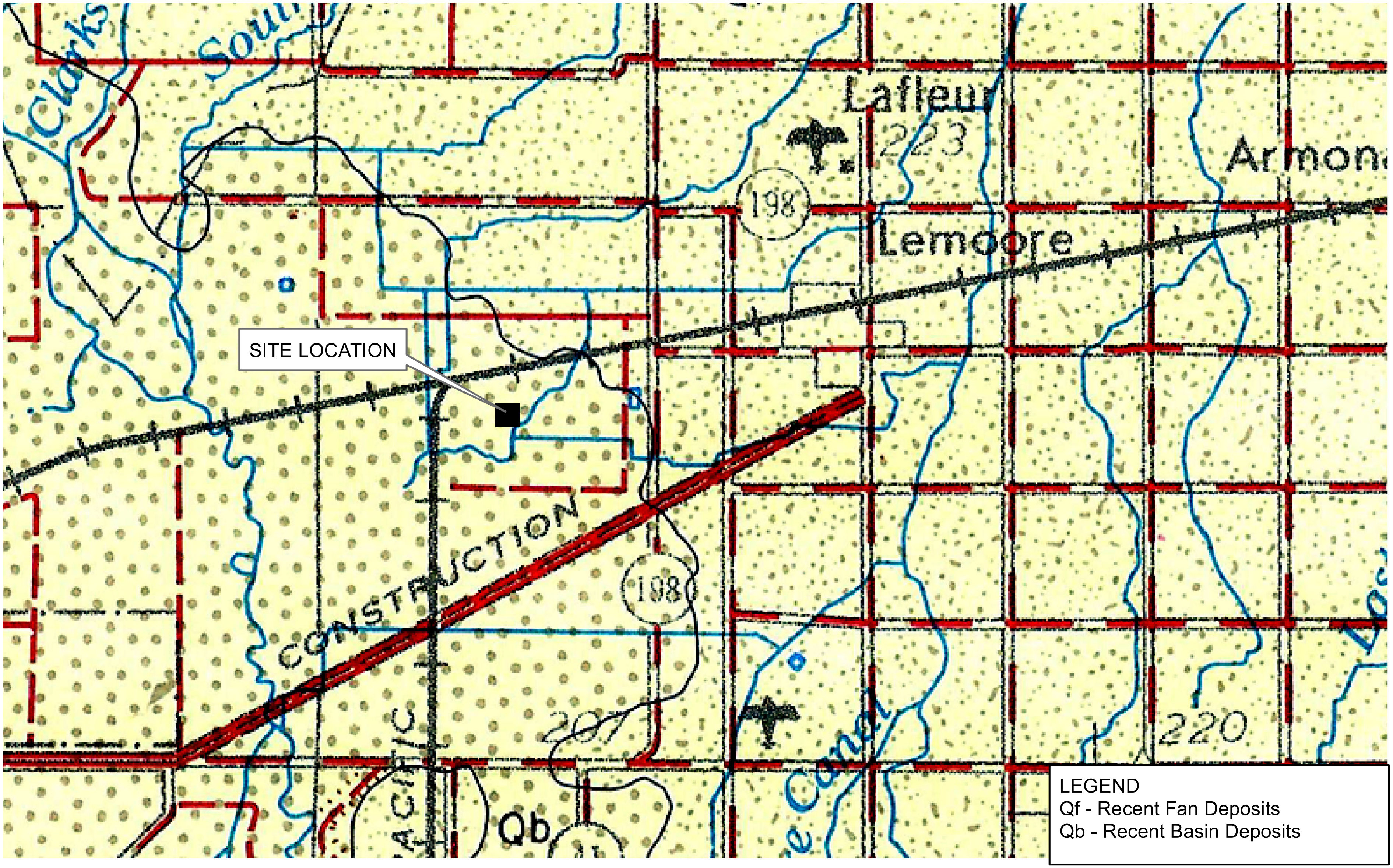
Geologic/Seismic Hazard Evaluation
Lemoore Student Center
West Hills College
Lemoore, California

BSK Job No. G1100311B
Area Hydrograph
Figure C2



LEGEND
Qf - Recent Fan Deposits
Qb - Recent Basin Deposits

Source: Source: Geologic Map of California, Fresno Sheet, 1965
Datum: NAD 1983 California Teale Albers

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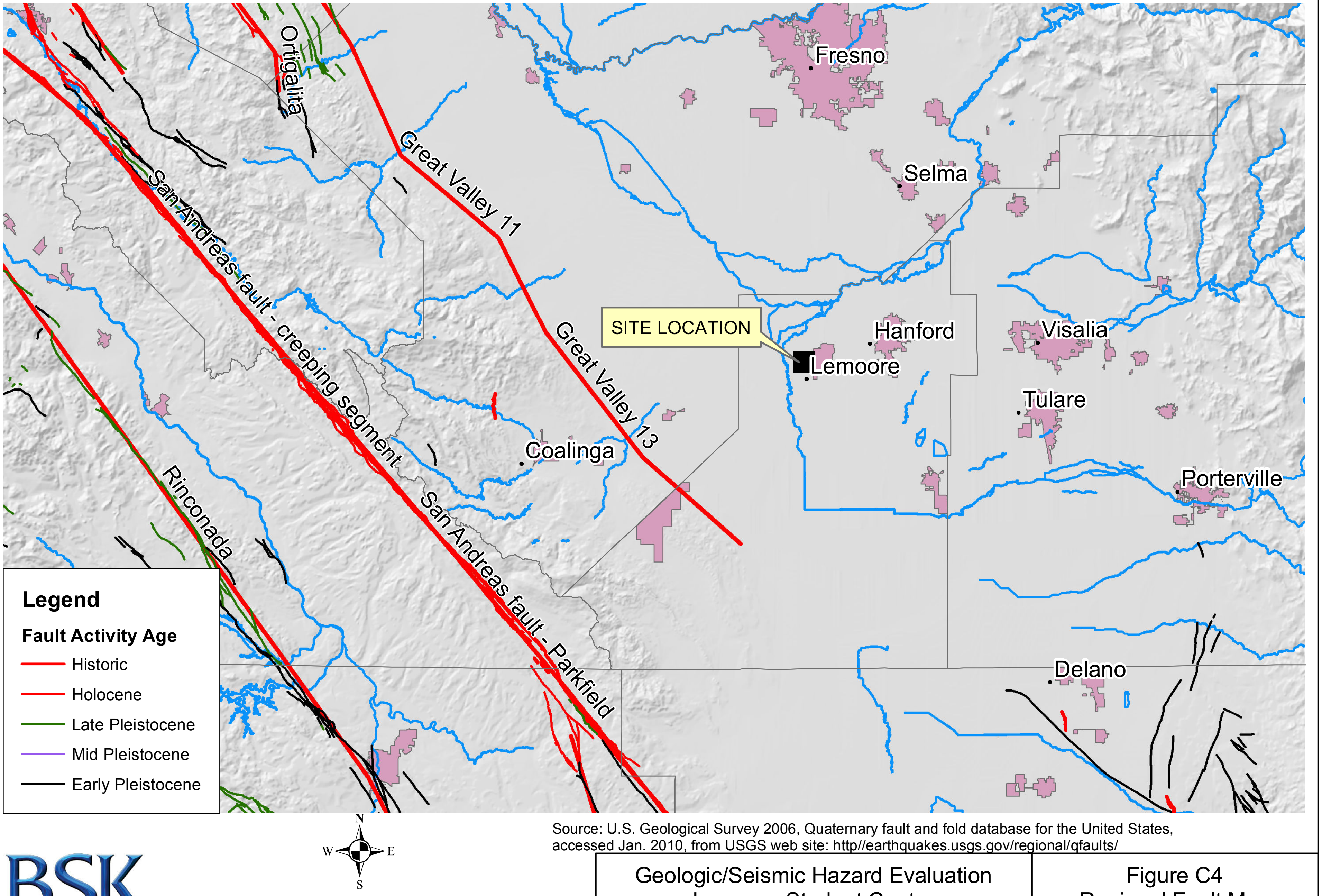
Geologic/Seismic Hazard Evaluation
Lemoore Student Center
West Hills College
Lemoore, California

Figure C3
Geologic Map
BSK Project G1100311B



Source: U.S. Geological Survey 2006, Quaternary fault and fold database for the United States, accessed Jan. 2010, from USGS web site: http//earthquakes.usgs.gov/regional/qfaults/

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Geologic/Seismic Hazard Evaluation
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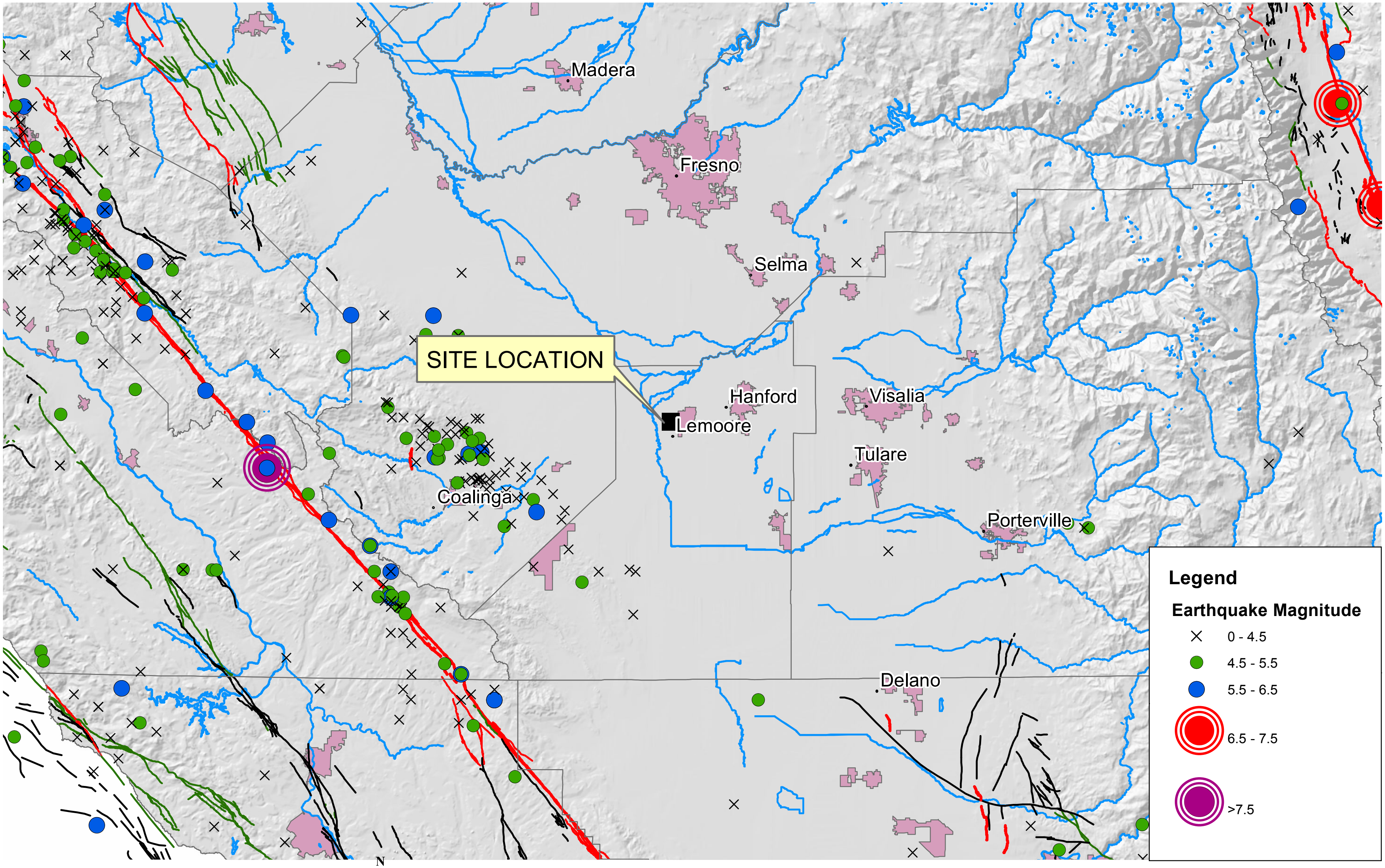
Lemoore, California

Figure C4
Regional Fault Map
BSK Project G1100311B



Source: California Geological Survey 2000, Digital Earthquake Catalog

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Geologic/Seismic Hazard Evaluation
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West Hills College
Lemoore, California

Figure C5
Earthquake Epicenter Map
BSK Project G1100311B

LIQUEFACTION ANALYSIS DATA SHEETS AND RESULTS

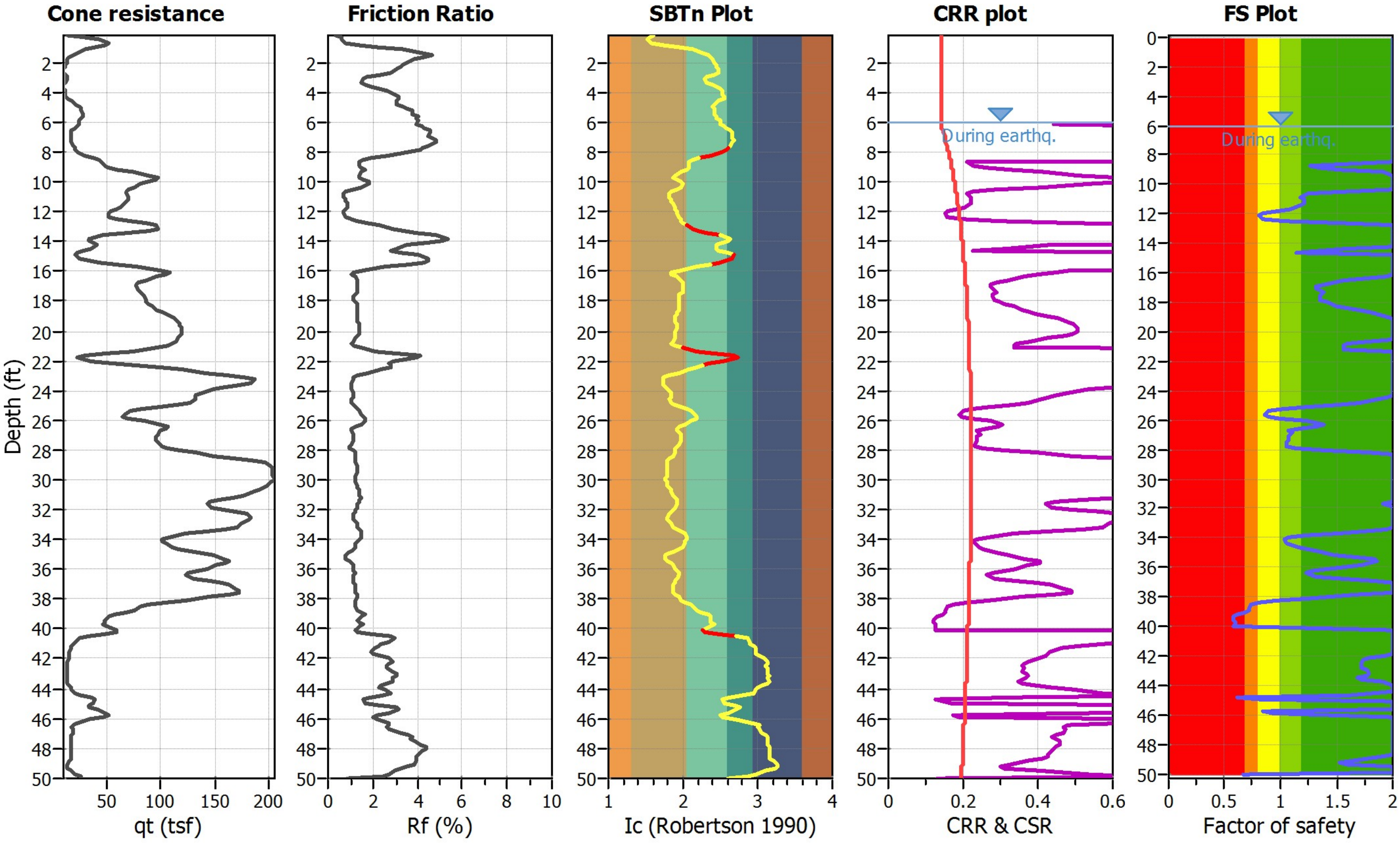
LIQUEFACTION ANALYSIS REPORT

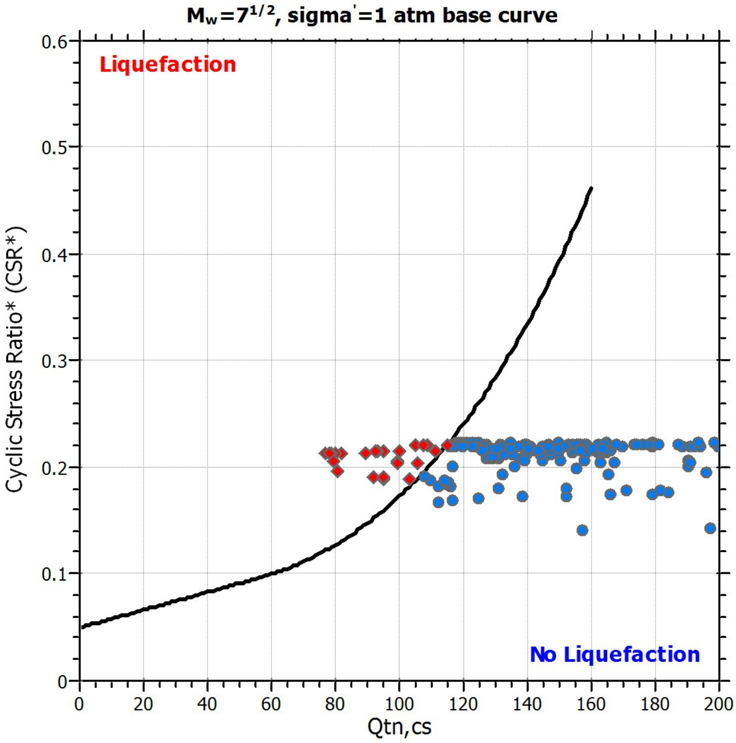
Project title : Lemoore Student Center **Location : West Hills College**

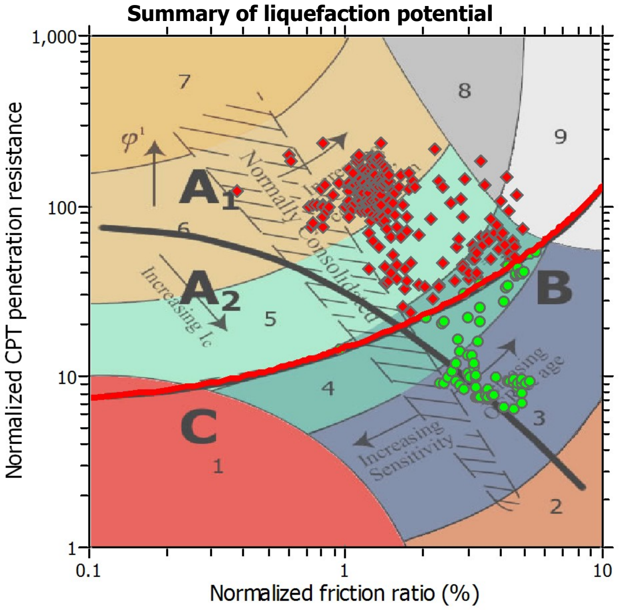
CPT file : NE Corner

Input parameters and analysis data

Analysis method:	NCEER 1998	G.W.T. (in-situ):	6.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson & Wride	G.W.T. (earthq.):	6.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.10	Ic cut-off value:	2.60	Trans. detect. applied:	Yes		
Peak ground acceleration:	0.25	Unit weight calculation:	Based on SBT	K_σ applied:	No		

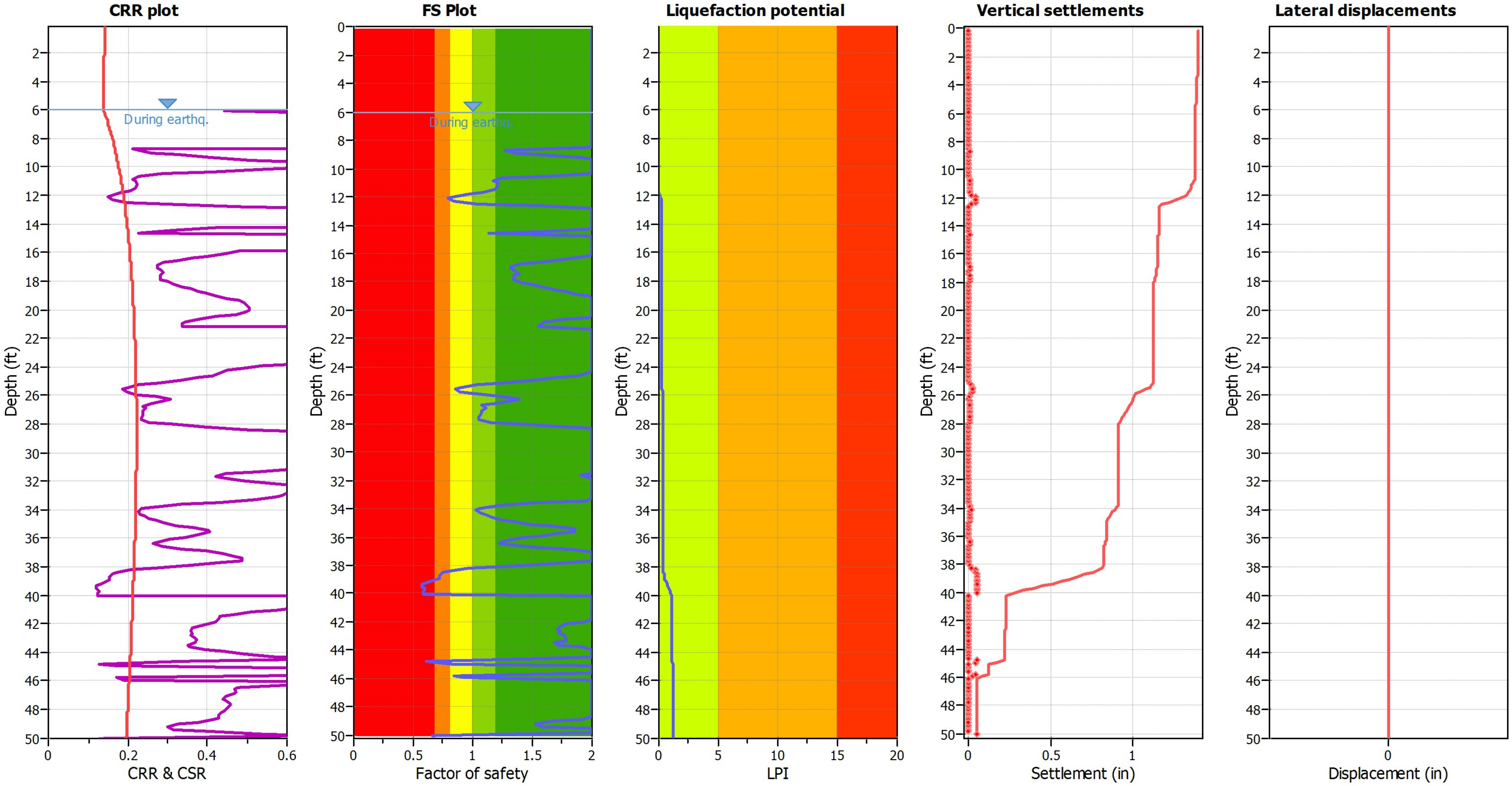






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER 1998	Depth to water table (erthq.):	6.00 ft	Fill weight:	N/A
Fines correction method:	Robertson & Wride	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.25	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	6.00 ft	Fill height:	N/A	Limit depth:	N/A

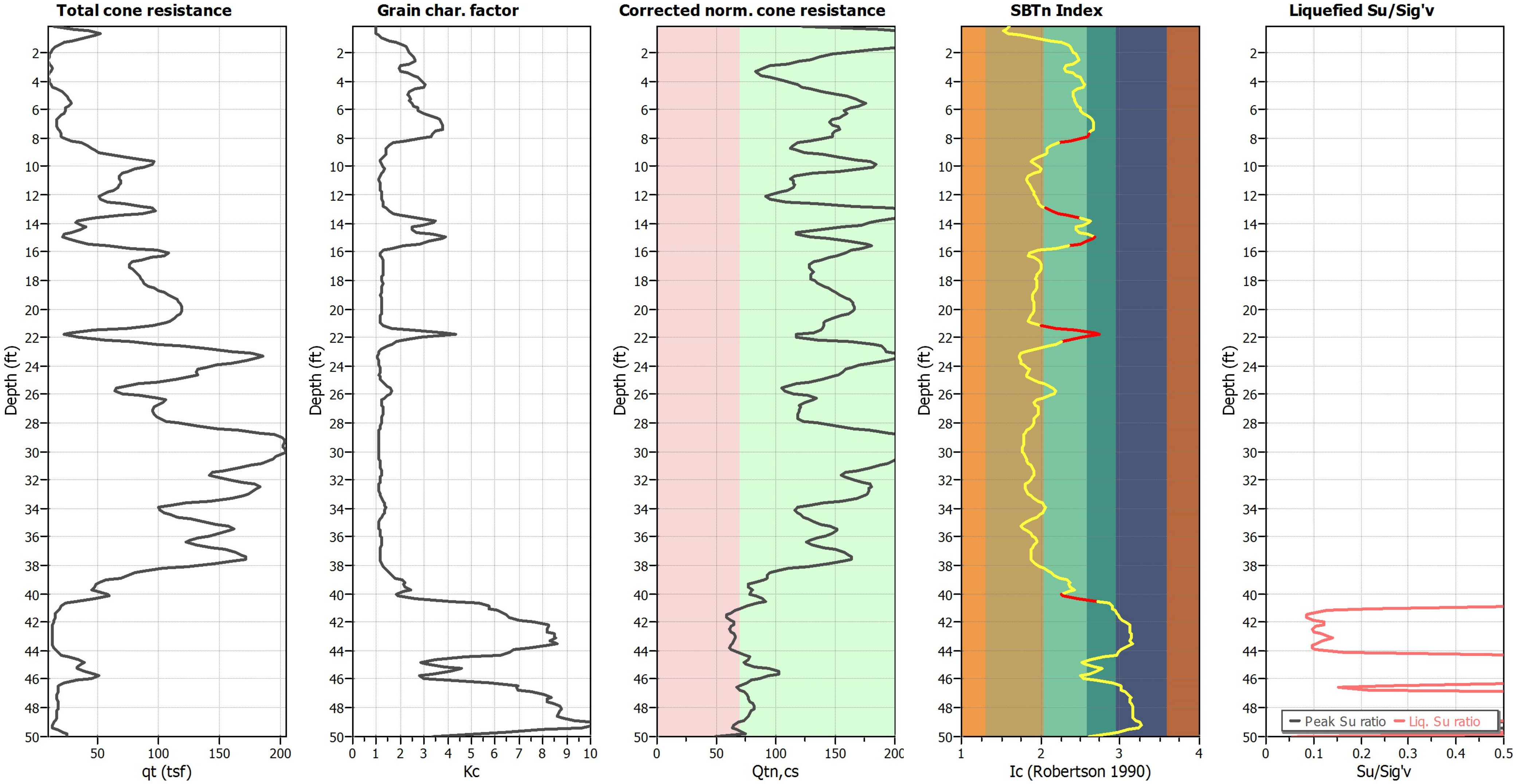
F.S. color scheme

- 🟥 Almost certain it will liquefy
- 🟧 Very likely to liquefy
- 🟨 Liquefaction and no liquefaction are equally likely
- 🟩 Unlike to liquefy
- 🟩 Almost certain it will not liquefy

LPI color scheme

- 🟥 Very high risk
- 🟧 High risk
- 🟨 Low risk

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	NCEER 1998	Depth to water table (erthq.):	6.00 ft	Fill weight:	N/A
Fines correction method:	Robertson & Wride	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	No
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.25	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	6.00 ft	Fill height:	N/A	Limit depth:	N/A

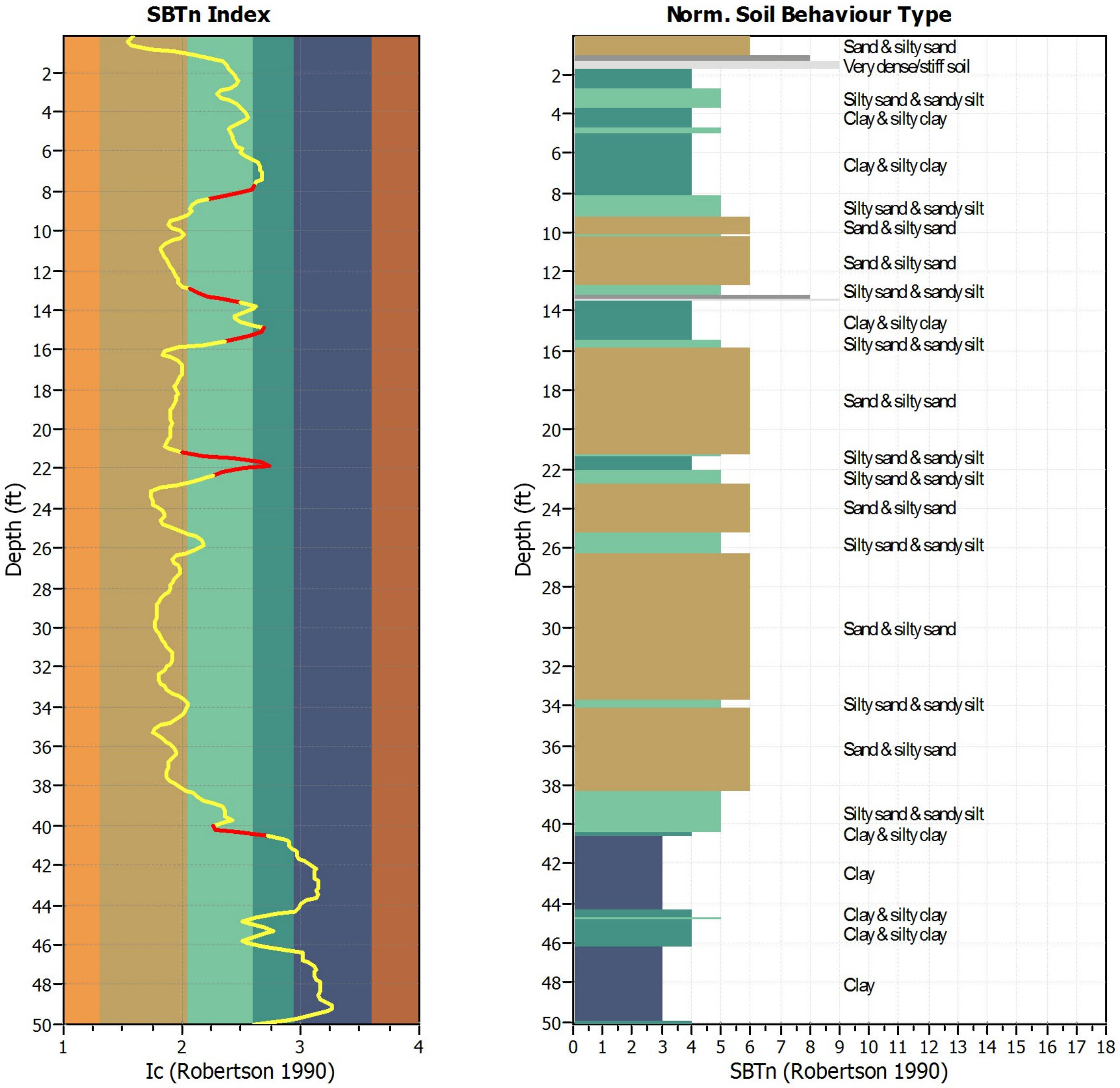
TRANSITION LAYER DETECTION ALGORITHM REPORT

Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties

I_c minimum check value:	2.10
I_c maximum check value:	2.92
I_c change ratio value:	0.0250
Minimum number of points in layer:	4

General statistics

Total points in CPT file:	305
Total points excluded:	28
Exclusion percentage:	9.18%
Number of layers detected:	6

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.97	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.92	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.87	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.82	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.77	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.72	0.16	0.00	1.97	2.00	0.00	9.70	0.16	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.62	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.44	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.37	0.16	0.00	4.27	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.32	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.27	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.09	2.00	0.00	9.22	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.17	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.12	0.16	0.00	5.91	2.00	0.00	9.10	0.16	0.00
6.07	2.00	0.00	9.07	0.16	0.00	6.23	2.00	0.00	9.05	0.16	0.00
6.40	2.00	0.00	9.02	0.16	0.00	6.56	2.00	0.00	9.00	0.16	0.00
6.73	2.00	0.00	8.97	0.16	0.00	6.89	2.00	0.00	8.95	0.16	0.00
7.05	2.00	0.00	8.92	0.16	0.00	7.22	2.00	0.00	8.90	0.16	0.00
7.38	2.00	0.00	8.87	0.16	0.00	7.55	2.00	0.00	8.85	0.16	0.00
7.71	2.00	0.00	8.82	0.16	0.00	7.87	2.00	0.00	8.80	0.16	0.00
8.04	2.00	0.00	8.77	0.16	0.00	8.20	2.00	0.00	8.75	0.16	0.00
8.37	2.00	0.00	8.72	0.16	0.00	8.53	2.00	0.00	8.70	0.16	0.00
8.69	1.27	0.00	8.67	0.16	0.00	8.86	1.35	0.00	8.65	0.16	0.00
9.02	1.53	0.00	8.62	0.16	0.00	9.19	1.92	0.00	8.60	0.16	0.00
9.35	2.00	0.00	8.57	0.16	0.00	9.51	2.00	0.00	8.55	0.16	0.00
9.68	2.00	0.00	8.52	0.16	0.00	9.84	2.00	0.00	8.50	0.16	0.00
10.01	2.00	0.00	8.47	0.16	0.00	10.17	2.00	0.00	8.45	0.16	0.00
10.33	2.00	0.00	8.42	0.16	0.00	10.50	1.61	0.00	8.40	0.16	0.00
10.66	1.25	0.00	8.37	0.16	0.00	10.83	1.17	0.00	8.35	0.16	0.00
10.99	1.20	0.00	8.32	0.16	0.00	11.15	1.21	0.00	8.30	0.16	0.00
11.32	1.20	0.00	8.27	0.16	0.00	11.48	1.18	0.00	8.25	0.16	0.00
11.65	1.09	0.00	8.22	0.16	0.00	11.81	0.97	0.03	8.20	0.16	0.01
11.98	0.85	0.15	8.17	0.16	0.06	12.14	0.80	0.20	8.15	0.16	0.08
12.30	0.84	0.16	8.12	0.16	0.07	12.47	1.03	0.00	8.10	0.16	0.00
12.63	1.55	0.00	8.07	0.16	0.00	12.80	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.02	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	2.00	0.00	7.97	0.16	0.00	13.45	2.00	0.00	7.95	0.16	0.00
13.62	2.00	0.00	7.92	0.16	0.00	13.78	2.00	0.00	7.90	0.16	0.00
13.94	2.00	0.00	7.87	0.16	0.00	14.11	2.00	0.00	7.85	0.16	0.00
14.27	2.00	0.00	7.82	0.16	0.00	14.44	1.57	0.00	7.80	0.16	0.00
14.60	1.14	0.00	7.77	0.16	0.00	14.76	2.00	0.00	7.75	0.16	0.00
14.93	2.00	0.00	7.72	0.16	0.00	15.09	2.00	0.00	7.70	0.16	0.00
15.26	2.00	0.00	7.67	0.16	0.00	15.42	2.00	0.00	7.65	0.16	0.00
15.58	2.00	0.00	7.62	0.16	0.00	15.75	2.00	0.00	7.60	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	2.00	0.00	7.57	0.16	0.00	16.08	2.00	0.00	7.55	0.16	0.00
16.24	1.94	0.00	7.52	0.16	0.00	16.40	1.76	0.00	7.50	0.16	0.00
16.57	1.57	0.00	7.47	0.16	0.00	16.73	1.40	0.00	7.45	0.16	0.00
16.90	1.32	0.00	7.42	0.16	0.00	17.06	1.32	0.00	7.40	0.16	0.00
17.22	1.35	0.00	7.37	0.16	0.00	17.39	1.39	0.00	7.35	0.16	0.00
17.55	1.35	0.00	7.32	0.16	0.00	17.72	1.34	0.00	7.30	0.16	0.00
17.88	1.35	0.00	7.27	0.16	0.00	18.04	1.42	0.00	7.25	0.16	0.00
18.21	1.48	0.00	7.22	0.16	0.00	18.37	1.59	0.00	7.20	0.16	0.00
18.54	1.70	0.00	7.17	0.16	0.00	18.70	1.78	0.00	7.15	0.16	0.00
18.86	1.86	0.00	7.12	0.16	0.00	19.03	1.98	0.00	7.10	0.16	0.00
19.19	2.00	0.00	7.07	0.16	0.00	19.36	2.00	0.00	7.05	0.16	0.00
19.52	2.00	0.00	7.02	0.16	0.00	19.69	2.00	0.00	7.00	0.16	0.00
19.85	2.00	0.00	6.97	0.16	0.00	20.01	2.00	0.00	6.95	0.16	0.00
20.18	2.00	0.00	6.92	0.16	0.00	20.34	2.00	0.00	6.90	0.16	0.00
20.51	1.98	0.00	6.87	0.16	0.00	20.67	1.76	0.00	6.85	0.16	0.00
20.83	1.60	0.00	6.82	0.16	0.00	21.00	1.57	0.00	6.80	0.16	0.00
21.16	1.55	0.00	6.77	0.16	0.00	21.33	2.00	0.00	6.75	0.16	0.00
21.49	2.00	0.00	6.72	0.16	0.00	21.65	2.00	0.00	6.70	0.16	0.00
21.82	2.00	0.00	6.67	0.16	0.00	21.98	2.00	0.00	6.65	0.16	0.00
22.15	2.00	0.00	6.62	0.16	0.00	22.31	2.00	0.00	6.60	0.16	0.00
22.47	2.00	0.00	6.57	0.16	0.00	22.64	2.00	0.00	6.55	0.16	0.00
22.80	2.00	0.00	6.52	0.16	0.00	22.97	2.00	0.00	6.50	0.16	0.00
23.13	2.00	0.00	6.47	0.16	0.00	23.29	2.00	0.00	6.45	0.16	0.00
23.46	2.00	0.00	6.42	0.16	0.00	23.62	2.00	0.00	6.40	0.16	0.00
23.79	2.00	0.00	6.37	0.16	0.00	23.95	2.00	0.00	6.35	0.16	0.00
24.11	2.00	0.00	6.32	0.16	0.00	24.28	2.00	0.00	6.30	0.16	0.00
24.44	1.97	0.00	6.27	0.16	0.00	24.61	1.87	0.00	6.25	0.16	0.00
24.77	1.70	0.00	6.22	0.16	0.00	24.93	1.50	0.00	6.20	0.16	0.00
25.10	1.24	0.00	6.17	0.16	0.00	25.26	1.03	0.00	6.15	0.16	0.00
25.43	0.90	0.10	6.12	0.16	0.03	25.59	0.85	0.15	6.10	0.16	0.05
25.75	0.89	0.11	6.07	0.16	0.03	25.92	1.00	0.00	6.05	0.16	0.00
26.08	1.23	0.00	6.02	0.16	0.00	26.25	1.38	0.00	6.00	0.16	0.00
26.41	1.32	0.00	5.97	0.16	0.00	26.57	1.18	0.00	5.95	0.16	0.00
26.74	1.07	0.00	5.92	0.16	0.00	26.90	1.11	0.00	5.90	0.16	0.00
27.07	1.08	0.00	5.87	0.16	0.00	27.23	1.07	0.00	5.85	0.16	0.00
27.40	1.06	0.00	5.82	0.16	0.00	27.56	1.05	0.00	5.80	0.16	0.00
27.72	1.05	0.00	5.77	0.16	0.00	27.89	1.14	0.00	5.75	0.16	0.00
28.05	1.40	0.00	5.72	0.16	0.00	28.22	1.77	0.00	5.70	0.16	0.00
28.38	2.00	0.00	5.67	0.16	0.00	28.54	2.00	0.00	5.65	0.16	0.00
28.71	2.00	0.00	5.62	0.16	0.00	28.87	2.00	0.00	5.60	0.16	0.00
29.04	2.00	0.00	5.57	0.16	0.00	29.20	2.00	0.00	5.55	0.16	0.00
29.36	2.00	0.00	5.52	0.16	0.00	29.53	2.00	0.00	5.50	0.16	0.00
29.69	2.00	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	2.00	0.00	5.27	0.16	0.00	31.17	2.00	0.00	5.25	0.16	0.00
31.33	2.00	0.00	5.22	0.16	0.00	31.50	2.00	0.00	5.20	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	1.91	0.00	5.17	0.16	0.00	31.82	1.98	0.00	5.15	0.16	0.00
31.99	2.00	0.00	5.12	0.16	0.00	32.15	2.00	0.00	5.10	0.16	0.00
32.32	2.00	0.00	5.07	0.16	0.00	32.48	2.00	0.00	5.05	0.16	0.00
32.64	2.00	0.00	5.02	0.16	0.00	32.81	2.00	0.00	5.00	0.16	0.00
32.97	2.00	0.00	4.97	0.16	0.00	33.14	2.00	0.00	4.95	0.16	0.00
33.30	2.00	0.00	4.92	0.16	0.00	33.46	1.95	0.00	4.90	0.16	0.00
33.63	1.53	0.00	4.87	0.16	0.00	33.79	1.23	0.00	4.85	0.16	0.00
33.96	1.07	0.00	4.82	0.16	0.00	34.12	1.03	0.00	4.80	0.16	0.00
34.28	1.06	0.00	4.77	0.16	0.00	34.45	1.10	0.00	4.75	0.16	0.00
34.61	1.16	0.00	4.72	0.16	0.00	34.78	1.24	0.00	4.70	0.16	0.00
34.94	1.34	0.00	4.67	0.16	0.00	35.10	1.47	0.00	4.65	0.16	0.00
35.27	1.66	0.00	4.62	0.16	0.00	35.43	1.85	0.00	4.60	0.16	0.00
35.60	1.86	0.00	4.57	0.16	0.00	35.76	1.72	0.00	4.55	0.16	0.00
35.93	1.57	0.00	4.52	0.16	0.00	36.09	1.42	0.00	4.50	0.16	0.00
36.25	1.28	0.00	4.47	0.16	0.00	36.42	1.22	0.00	4.45	0.16	0.00
36.58	1.32	0.00	4.42	0.16	0.00	36.75	1.56	0.00	4.40	0.16	0.00
36.91	1.82	0.00	4.37	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	2.00	0.00	4.30	0.16	0.00
37.57	2.00	0.00	4.27	0.16	0.00	37.73	2.00	0.00	4.25	0.16	0.00
37.89	1.66	0.00	4.22	0.16	0.00	38.06	1.24	0.00	4.20	0.16	0.00
38.22	0.97	0.03	4.17	0.16	0.01	38.39	0.80	0.20	4.15	0.16	0.04
38.55	0.74	0.26	4.12	0.16	0.05	38.71	0.72	0.28	4.10	0.16	0.06
38.88	0.72	0.28	4.07	0.16	0.06	39.04	0.69	0.31	4.05	0.16	0.06
39.21	0.61	0.39	4.02	0.16	0.08	39.37	0.57	0.43	4.00	0.16	0.09
39.53	0.57	0.43	3.97	0.16	0.08	39.70	0.60	0.40	3.95	0.16	0.08
39.86	0.59	0.41	3.92	0.16	0.08	40.03	0.59	0.41	3.90	0.16	0.08
40.19	2.00	0.00	3.87	0.16	0.00	40.35	2.00	0.00	3.85	0.16	0.00
40.52	2.00	0.00	3.82	0.16	0.00	40.68	2.00	0.00	3.80	0.16	0.00
40.85	2.00	0.00	3.77	0.16	0.00	41.01	2.00	0.00	3.75	0.16	0.00
41.17	2.00	0.00	3.72	0.16	0.00	41.34	2.00	0.00	3.70	0.16	0.00
41.50	2.00	0.00	3.67	0.16	0.00	41.67	2.00	0.00	3.65	0.16	0.00
41.83	2.00	0.00	3.62	0.16	0.00	41.99	1.94	0.00	3.60	0.16	0.00
42.16	1.79	0.00	3.57	0.16	0.00	42.32	1.73	0.00	3.55	0.16	0.00
42.49	1.71	0.00	3.52	0.16	0.00	42.65	1.73	0.00	3.50	0.16	0.00
42.81	1.72	0.00	3.47	0.16	0.00	42.98	1.77	0.00	3.45	0.16	0.00
43.14	1.78	0.00	3.42	0.16	0.00	43.31	1.78	0.00	3.40	0.16	0.00
43.47	1.68	0.00	3.37	0.16	0.00	43.64	1.71	0.00	3.35	0.16	0.00
43.80	1.91	0.00	3.32	0.16	0.00	43.96	2.00	0.00	3.30	0.16	0.00
44.13	2.00	0.00	3.27	0.16	0.00	44.29	2.00	0.00	3.25	0.16	0.00
44.46	2.00	0.00	3.22	0.16	0.00	44.62	1.61	0.00	3.20	0.16	0.00
44.78	0.61	0.39	3.17	0.16	0.06	44.95	0.83	0.17	3.15	0.16	0.03
45.11	2.00	0.00	3.12	0.16	0.00	45.28	2.00	0.00	3.10	0.16	0.00
45.44	2.00	0.00	3.07	0.16	0.00	45.60	2.00	0.00	3.05	0.16	0.00
45.77	0.84	0.16	3.02	0.16	0.02	45.93	0.93	0.07	3.00	0.16	0.01
46.10	2.00	0.00	2.97	0.16	0.00	46.26	2.00	0.00	2.95	0.16	0.00
46.42	2.00	0.00	2.92	0.16	0.00	46.59	2.00	0.00	2.90	0.16	0.00
46.75	2.00	0.00	2.87	0.16	0.00	46.92	2.00	0.00	2.85	0.16	0.00
47.08	2.00	0.00	2.82	0.16	0.00	47.24	2.00	0.00	2.80	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
47.41	2.00	0.00	2.77	0.16	0.00	47.57	2.00	0.00	2.75	0.16	0.00
47.74	2.00	0.00	2.72	0.16	0.00	47.90	2.00	0.00	2.70	0.16	0.00
48.06	2.00	0.00	2.67	0.16	0.00	48.23	2.00	0.00	2.65	0.16	0.00
48.39	2.00	0.00	2.62	0.16	0.00	48.56	2.00	0.00	2.60	0.16	0.00
48.72	2.00	0.00	2.57	0.16	0.00	48.88	1.90	0.00	2.55	0.16	0.00
49.05	1.65	0.00	2.52	0.16	0.00	49.21	1.53	0.00	2.50	0.16	0.00
49.38	1.59	0.00	2.47	0.16	0.00	49.54	2.00	0.00	2.45	0.16	0.00
49.70	2.00	0.00	2.42	0.16	0.00	49.87	2.00	0.00	2.40	0.16	0.00
50.03	0.66	0.34	2.37	0.16	0.04						

Overall liquefaction potential: 1.26

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS:	Calculated factor of safety for test point
F_L:	1 - FS
w_z:	Function value of the extend of soil liquefaction according to depth
d_z:	Layer thickness (ft)
LPI:	Liquefaction potential index value for test point

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Kc	Qc1n	Qc1n,cs	N1,60 (blows)	Vs (ft/s)	Gmax (tsf)	CSR	Shear, γ (%)	Svol,15 (%)	Nc	ev (%)	Settle. (in)
0.16	1.60	1.00	122.15	122.15	22	227.9	77	0.14	0.002	0.00	11.65	0.00	0.000
0.33	1.56	1.00	185.72	185.72	33	326.7	177	0.14	0.002	0.00	11.65	0.00	0.000
0.49	1.54	1.00	201.72	201.72	36	380.7	248	0.14	0.002	0.00	11.65	0.00	0.000
0.66	1.58	1.00	233.76	233.76	42	434.0	334	0.14	0.002	0.00	11.65	0.00	0.000
0.82	1.74	1.07	234.76	250.66	48	464.7	393	0.14	0.002	0.00	11.65	0.00	0.000
0.98	1.94	1.23	214.81	263.48	54	472.7	413	0.14	0.002	0.00	11.65	0.00	0.000
1.15	2.12	1.49	183.12	273.70	60	464.6	400	0.14	0.003	0.00	11.65	0.00	0.000
1.31	2.26	1.83	147.14	268.56	62	444.1	363	0.14	0.003	0.00	11.65	0.00	0.000
1.48	2.35	2.13	116.74	248.40	60	418.8	318	0.14	0.005	0.00	11.65	0.00	0.000
1.64	2.38	2.24	94.37	210.94	51	393.7	276	0.14	0.006	0.00	11.65	0.00	0.000
1.80	2.40	2.31	78.56	181.18	45	373.5	244	0.14	0.008	0.00	11.65	0.00	0.000
1.97	2.41	2.36	67.87	160.02	40	359.5	223	0.14	0.011	0.00	11.65	0.00	0.000
2.13	2.44	2.47	59.74	147.49	37	349.5	209	0.14	0.013	0.01	11.65	0.01	0.000
2.30	2.46	2.55	53.51	136.62	34	341.5	197	0.14	0.017	0.01	11.65	0.01	0.000
2.46	2.47	2.64	48.97	129.34	33	336.9	191	0.14	0.020	0.01	11.65	0.01	0.000
2.62	2.47	2.61	45.77	119.25	30	333.1	185	0.14	0.023	0.01	11.65	0.01	0.000
2.79	2.41	2.35	46.55	109.52	27	338.4	190	0.14	0.024	0.02	11.65	0.01	0.001
2.95	2.33	2.03	46.98	95.55	23	339.0	189	0.14	0.026	0.02	11.65	0.02	0.001
3.12	2.30	1.94	45.60	88.68	21	337.7	187	0.14	0.029	0.03	11.65	0.02	0.001
3.28	2.32	2.02	40.96	82.67	20	327.8	174	0.14	0.038	0.04	11.65	0.03	0.001
3.44	2.40	2.31	36.56	84.52	21	322.7	168	0.14	0.046	0.04	11.65	0.04	0.002
3.61	2.45	2.54	34.37	87.21	22	323.4	169	0.14	0.048	0.04	11.65	0.04	0.002
3.77	2.49	2.72	34.94	95.15	24	336.5	186	0.14	0.040	0.03	11.65	0.03	0.001
3.94	2.52	2.85	36.84	105.06	27	354.1	209	0.14	0.031	0.02	11.65	0.02	0.001
4.10	2.54	2.97	38.16	113.43	30	369.0	230	0.14	0.027	0.02	11.65	0.01	0.001
4.27	2.56	3.07	38.54	118.40	31	379.1	245	0.14	0.025	0.01	11.65	0.01	0.001
4.43	2.54	3.00	40.58	121.73	32	393.2	266	0.14	0.022	0.01	11.65	0.01	0.000
4.59	2.47	2.62	49.25	129.23	33	428.4	322	0.14	0.016	0.01	11.65	0.01	0.000
4.76	2.41	2.37	58.77	139.33	34	465.0	387	0.14	0.013	0.01	11.65	0.01	0.000
4.92	2.40	2.32	65.99	152.83	38	497.1	449	0.14	0.011	0.01	11.65	0.00	0.000
5.09	2.41	2.37	67.06	159.15	39	510.4	477	0.14	0.010	0.00	11.65	0.00	0.000
5.25	2.43	2.43	68.48	166.64	42	525.4	509	0.14	0.010	0.00	11.65	0.00	0.000
5.41	2.42	2.40	70.69	169.62	42	539.0	539	0.14	0.010	0.00	11.65	0.00	0.000
5.58	2.44	2.50	70.27	176.00	44	549.3	562	0.14	0.009	0.00	11.65	0.00	0.000
5.74	2.46	2.57	65.85	169.00	43	541.1	543	0.14	0.010	0.00	11.65	0.00	0.000
5.91	2.50	2.77	59.21	164.00	42	528.2	514	0.14	0.011	0.00	11.65	0.00	0.000

Total estimated settlement: 0.01

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
6.07	157.59	2.00	0.00	0.00	6.23	197.45	2.00	0.00	0.00
6.40	225.77	2.00	0.00	0.00	6.56	289.66	2.00	0.00	0.00
6.73	306.40	2.00	0.00	0.00	6.89	309.50	2.00	0.00	0.00
7.05	329.04	2.00	0.00	0.00	7.22	341.69	2.00	0.00	0.00
7.38	339.34	2.00	0.00	0.00	7.55	276.28	2.00	0.00	0.00
7.71	242.06	2.00	0.00	0.00	7.87	228.55	2.00	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
8.04	158.42	2.00	0.00	0.00	8.20	128.38	2.00	0.00	0.00
8.37	118.47	2.00	0.00	0.00	8.53	114.39	2.00	0.00	0.00
8.69	112.35	1.27	0.27	0.01	8.86	116.65	1.35	0.00	0.00
9.02	124.78	1.53	0.00	0.00	9.19	138.67	1.92	0.00	0.00
9.35	152.26	2.00	0.00	0.00	9.51	166.50	2.00	0.00	0.00
9.68	179.49	2.00	0.00	0.00	9.84	184.13	2.00	0.00	0.00
10.01	181.91	2.00	0.00	0.00	10.17	171.53	2.00	0.00	0.00
10.33	152.27	2.00	0.00	0.00	10.50	131.14	1.61	0.00	0.00
10.66	116.19	1.25	0.36	0.01	10.83	112.64	1.17	0.37	0.01
10.99	114.76	1.20	0.37	0.01	11.15	115.24	1.21	0.37	0.01
11.32	115.37	1.20	0.37	0.01	11.48	114.40	1.18	0.37	0.01
11.65	109.85	1.09	0.52	0.01	11.81	103.25	0.97	0.86	0.02
11.98	94.96	0.85	2.19	0.04	12.14	91.64	0.80	2.31	0.05
12.30	94.87	0.84	2.19	0.04	12.47	108.27	1.03	0.82	0.02
12.63	132.76	1.55	0.00	0.00	12.80	165.32	2.00	0.00	0.00
12.96	196.35	2.00	0.00	0.00	13.12	220.33	2.00	0.00	0.00
13.29	227.44	2.00	0.00	0.00	13.45	217.00	2.00	0.00	0.00
13.62	201.34	2.00	0.00	0.00	13.78	335.84	2.00	0.00	0.00
13.94	307.90	2.00	0.00	0.00	14.11	203.15	2.00	0.00	0.00
14.27	155.78	2.00	0.00	0.00	14.44	136.06	1.57	0.00	0.00
14.60	116.78	1.14	0.50	0.01	14.76	190.38	2.00	0.00	0.00
14.93	307.66	2.00	0.00	0.00	15.09	317.59	2.00	0.00	0.00
15.26	237.91	2.00	0.00	0.00	15.42	181.53	2.00	0.00	0.00
15.58	180.13	2.00	0.00	0.00	15.75	171.46	2.00	0.00	0.00
15.91	163.15	2.00	0.00	0.00	16.08	158.17	2.00	0.00	0.00
16.24	150.86	1.94	0.00	0.00	16.40	144.76	1.76	0.00	0.00
16.57	137.86	1.57	0.00	0.00	16.73	131.15	1.40	0.00	0.00
16.90	127.76	1.32	0.24	0.00	17.06	127.88	1.32	0.24	0.00
17.22	129.50	1.35	0.00	0.00	17.39	131.10	1.39	0.00	0.00
17.55	129.40	1.35	0.24	0.00	17.72	129.40	1.34	0.24	0.00
17.88	129.66	1.35	0.24	0.00	18.04	132.97	1.42	0.00	0.00
18.21	135.81	1.48	0.00	0.00	18.37	140.12	1.59	0.00	0.00
18.54	144.28	1.70	0.00	0.00	18.70	147.45	1.78	0.00	0.00
18.86	150.22	1.86	0.00	0.00	19.03	154.07	1.98	0.00	0.00
19.19	158.71	2.00	0.00	0.00	19.36	162.51	2.00	0.00	0.00
19.52	164.29	2.00	0.00	0.00	19.69	165.05	2.00	0.00	0.00
19.85	165.74	2.00	0.00	0.00	20.01	166.13	2.00	0.00	0.00
20.18	164.89	2.00	0.00	0.00	20.34	161.55	2.00	0.00	0.00
20.51	154.86	1.98	0.00	0.00	20.67	147.79	1.76	0.00	0.00
20.83	141.66	1.60	0.00	0.00	21.00	140.54	1.57	0.00	0.00
21.16	140.15	1.55	0.00	0.00	21.33	138.53	2.00	0.00	0.00
21.49	137.50	2.00	0.00	0.00	21.65	306.84	2.00	0.00	0.00
21.82	117.13	2.00	0.00	0.00	21.98	130.84	2.00	0.00	0.00
22.15	135.43	2.00	0.00	0.00	22.31	162.47	2.00	0.00	0.00
22.47	183.14	2.00	0.00	0.00	22.64	188.92	2.00	0.00	0.00
22.80	191.04	2.00	0.00	0.00	22.97	192.61	2.00	0.00	0.00
23.13	199.90	2.00	0.00	0.00	23.29	208.59	2.00	0.00	0.00
23.46	204.19	2.00	0.00	0.00	23.62	194.40	2.00	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
23.79	179.39	2.00	0.00	0.00	23.95	170.29	2.00	0.00	0.00
24.11	162.81	2.00	0.00	0.00	24.28	158.70	2.00	0.00	0.00
24.44	156.02	1.97	0.00	0.00	24.61	152.87	1.87	0.00	0.00
24.77	146.97	1.70	0.00	0.00	24.93	139.28	1.50	0.00	0.00
25.10	127.54	1.24	0.34	0.01	25.26	116.74	1.03	0.76	0.02
25.43	108.71	0.90	1.39	0.03	25.59	105.16	0.85	1.46	0.03
25.75	107.68	0.89	1.41	0.03	25.92	114.89	1.00	0.78	0.02
26.08	127.41	1.23	0.34	0.01	26.25	134.54	1.38	0.00	0.00
26.41	131.86	1.32	0.24	0.00	26.57	124.84	1.18	0.35	0.01
26.74	119.32	1.07	0.49	0.01	26.90	121.20	1.11	0.49	0.01
27.07	119.48	1.08	0.49	0.01	27.23	119.14	1.07	0.49	0.01
27.40	118.84	1.06	0.49	0.01	27.56	118.16	1.05	0.49	0.01
27.72	118.30	1.05	0.49	0.01	27.89	123.18	1.14	0.48	0.01
28.05	135.27	1.40	0.00	0.00	28.22	149.83	1.77	0.00	0.00
28.38	164.91	2.00	0.00	0.00	28.54	179.56	2.00	0.00	0.00
28.71	193.67	2.00	0.00	0.00	28.87	204.77	2.00	0.00	0.00
29.04	210.52	2.00	0.00	0.00	29.20	213.08	2.00	0.00	0.00
29.36	211.61	2.00	0.00	0.00	29.53	209.62	2.00	0.00	0.00
29.69	207.65	2.00	0.00	0.00	29.86	208.61	2.00	0.00	0.00
30.02	208.20	2.00	0.00	0.00	30.18	205.74	2.00	0.00	0.00
30.35	202.95	2.00	0.00	0.00	30.51	201.22	2.00	0.00	0.00
30.68	198.74	2.00	0.00	0.00	30.84	194.03	2.00	0.00	0.00
31.00	187.62	2.00	0.00	0.00	31.17	179.16	2.00	0.00	0.00
31.33	168.00	2.00	0.00	0.00	31.50	158.15	2.00	0.00	0.00
31.66	154.27	1.91	0.00	0.00	31.82	156.84	1.98	0.00	0.00
31.99	164.18	2.00	0.00	0.00	32.15	173.51	2.00	0.00	0.00
32.32	178.82	2.00	0.00	0.00	32.48	181.07	2.00	0.00	0.00
32.64	178.27	2.00	0.00	0.00	32.81	177.83	2.00	0.00	0.00
32.97	176.24	2.00	0.00	0.00	33.14	174.60	2.00	0.00	0.00
33.30	167.88	2.00	0.00	0.00	33.46	155.34	1.95	0.00	0.00
33.63	140.11	1.53	0.00	0.00	33.79	126.73	1.23	0.34	0.01
33.96	118.40	1.07	0.49	0.01	34.12	116.23	1.03	0.77	0.02
34.28	117.73	1.06	0.50	0.01	34.45	120.18	1.10	0.49	0.01
34.61	123.13	1.16	0.35	0.01	34.78	127.31	1.24	0.34	0.01
34.94	131.69	1.34	0.24	0.00	35.10	137.58	1.47	0.00	0.00
35.27	144.86	1.66	0.00	0.00	35.43	151.61	1.85	0.00	0.00
35.60	151.78	1.86	0.00	0.00	35.76	146.99	1.72	0.00	0.00
35.93	141.37	1.57	0.00	0.00	36.09	134.99	1.42	0.00	0.00
36.25	128.57	1.28	0.24	0.00	36.42	125.82	1.22	0.35	0.01
36.58	130.49	1.32	0.24	0.00	36.75	140.49	1.56	0.00	0.00
36.91	150.20	1.82	0.00	0.00	37.07	156.92	2.00	0.00	0.00
37.24	160.90	2.00	0.00	0.00	37.40	163.65	2.00	0.00	0.00
37.57	163.56	2.00	0.00	0.00	37.73	157.09	2.00	0.00	0.00
37.89	144.01	1.66	0.00	0.00	38.06	126.42	1.24	0.34	0.01
38.22	111.34	0.97	0.80	0.02	38.39	99.74	0.80	2.04	0.04
38.55	95.01	0.74	2.44	0.05	38.71	93.12	0.72	2.48	0.05
38.88	92.72	0.72	2.49	0.05	39.04	89.69	0.69	2.55	0.05
39.21	81.91	0.61	2.75	0.05	39.37	76.62	0.57	2.91	0.06

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
39.53	76.88	0.57	2.90	0.06	39.70	80.20	0.60	2.80	0.06
39.86	78.90	0.59	2.84	0.06	40.03	78.31	0.59	2.86	0.06
40.19	83.19	2.00	0.00	0.00	40.35	88.56	2.00	0.00	0.00
40.52	91.52	2.00	0.00	0.00	40.68	84.14	2.00	0.00	0.00
40.85	75.30	2.00	0.00	0.00	41.01	69.13	2.00	0.00	0.00
41.17	65.31	2.00	0.00	0.00	41.34	61.63	2.00	0.00	0.00
41.50	58.66	2.00	0.00	0.00	41.67	59.09	2.00	0.00	0.00
41.83	62.11	2.00	0.00	0.00	41.99	64.85	1.94	0.00	0.00
42.16	64.75	1.79	0.01	0.00	42.32	62.45	1.73	0.02	0.00
42.49	61.25	1.71	0.02	0.00	42.65	61.88	1.73	0.02	0.00
42.81	64.12	1.72	0.02	0.00	42.98	65.58	1.77	0.01	0.00
43.14	66.32	1.78	0.01	0.00	43.31	64.44	1.78	0.01	0.00
43.47	62.91	1.68	0.02	0.00	43.64	61.66	1.71	0.02	0.00
43.80	61.46	1.91	0.00	0.00	43.96	62.40	2.00	0.00	0.00
44.13	67.86	2.00	0.00	0.00	44.29	74.23	2.00	0.00	0.00
44.46	78.18	2.00	0.00	0.00	44.62	139.41	1.61	0.00	0.00
44.78	79.34	0.61	2.82	0.06	44.95	99.21	0.83	2.06	0.04
45.11	190.64	2.00	0.00	0.00	45.28	94.42	2.00	0.00	0.00
45.44	101.97	2.00	0.00	0.00	45.60	167.61	2.00	0.00	0.00
45.77	99.40	0.84	2.05	0.04	45.93	105.51	0.93	1.45	0.03
46.10	191.47	2.00	0.00	0.00	46.26	75.75	2.00	0.00	0.00
46.42	69.41	2.00	0.00	0.00	46.59	67.22	2.00	0.00	0.00
46.75	69.06	2.00	0.00	0.00	46.92	73.64	2.00	0.00	0.00
47.08	75.60	2.00	0.00	0.00	47.24	76.56	2.00	0.00	0.00
47.41	76.22	2.00	0.00	0.00	47.57	78.28	2.00	0.00	0.00
47.74	80.47	2.00	0.00	0.00	47.90	82.05	2.00	0.00	0.00
48.06	81.31	2.00	0.00	0.00	48.23	79.51	2.00	0.00	0.00
48.39	77.71	2.00	0.00	0.00	48.56	77.02	2.00	0.00	0.00
48.72	75.69	2.00	0.00	0.00	48.88	73.23	1.90	0.01	0.00
49.05	68.77	1.65	0.03	0.00	49.21	64.35	1.53	0.05	0.00
49.38	63.18	1.59	0.04	0.00	49.54	67.13	2.00	0.00	0.00
49.70	72.15	2.00	0.00	0.00	49.87	74.48	2.00	0.00	0.00
50.03	80.89	0.66	2.78	0.05					

Total estimated settlement: 1.38

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
Settlement: Calculated settlement

BSK Associates

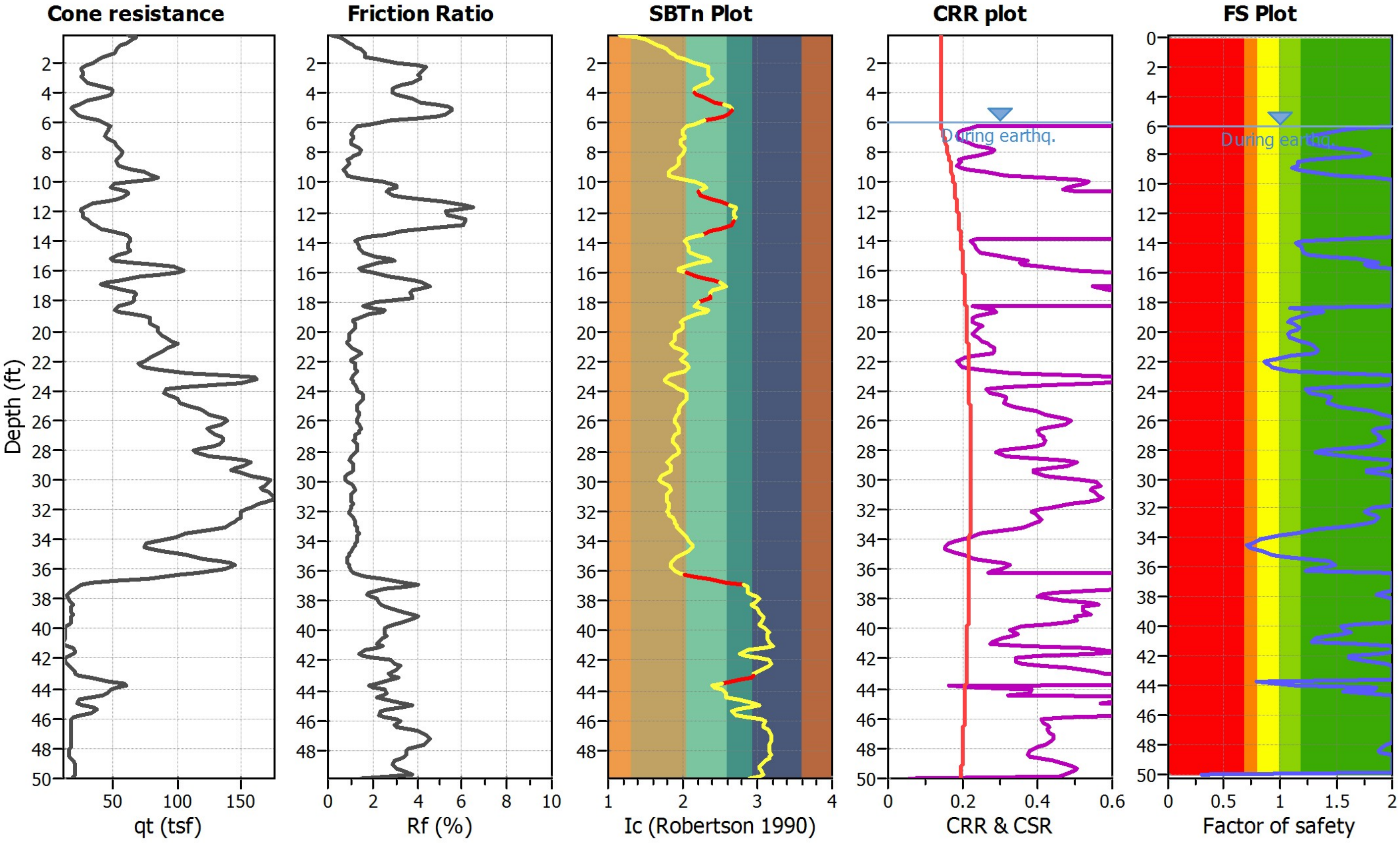
LIQUEFACTION ANALYSIS REPORT

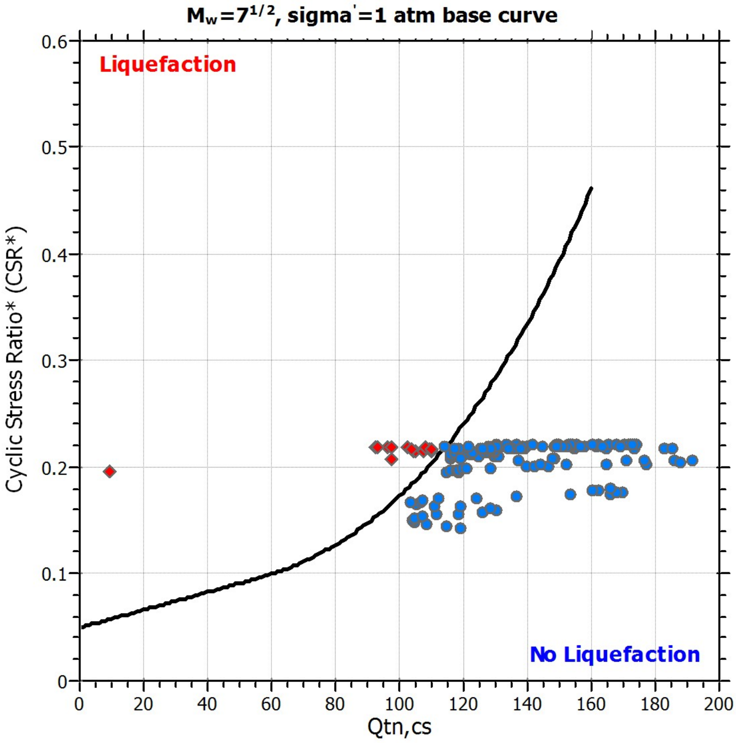
Project title : Lemoore Student Center **Location : West Hills College**

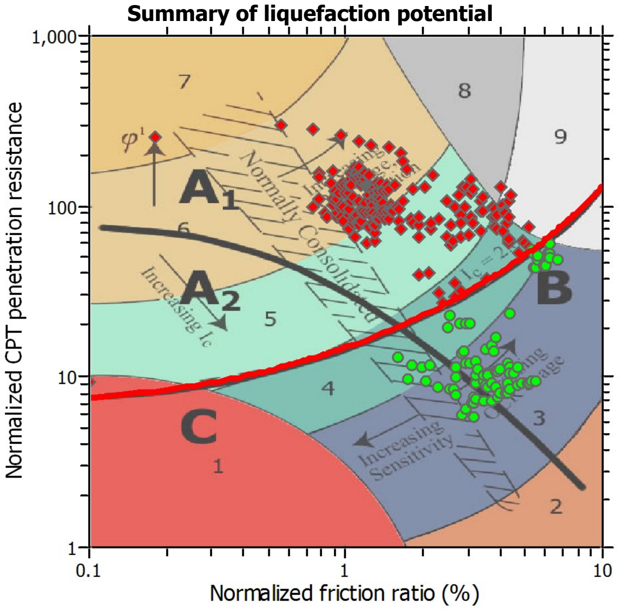
CPT file : NW Corner

Input parameters and analysis data

Analysis method:	NCEER 1998	G.W.T. (in-situ):	6.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson & Wride	G.W.T. (earthq.):	6.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.10	Ic cut-off value:	2.60	Trans. detect. applied:	Yes		
Peak ground acceleration:	0.25	Unit weight calculation:	Based on SBT	K_σ applied:	No		

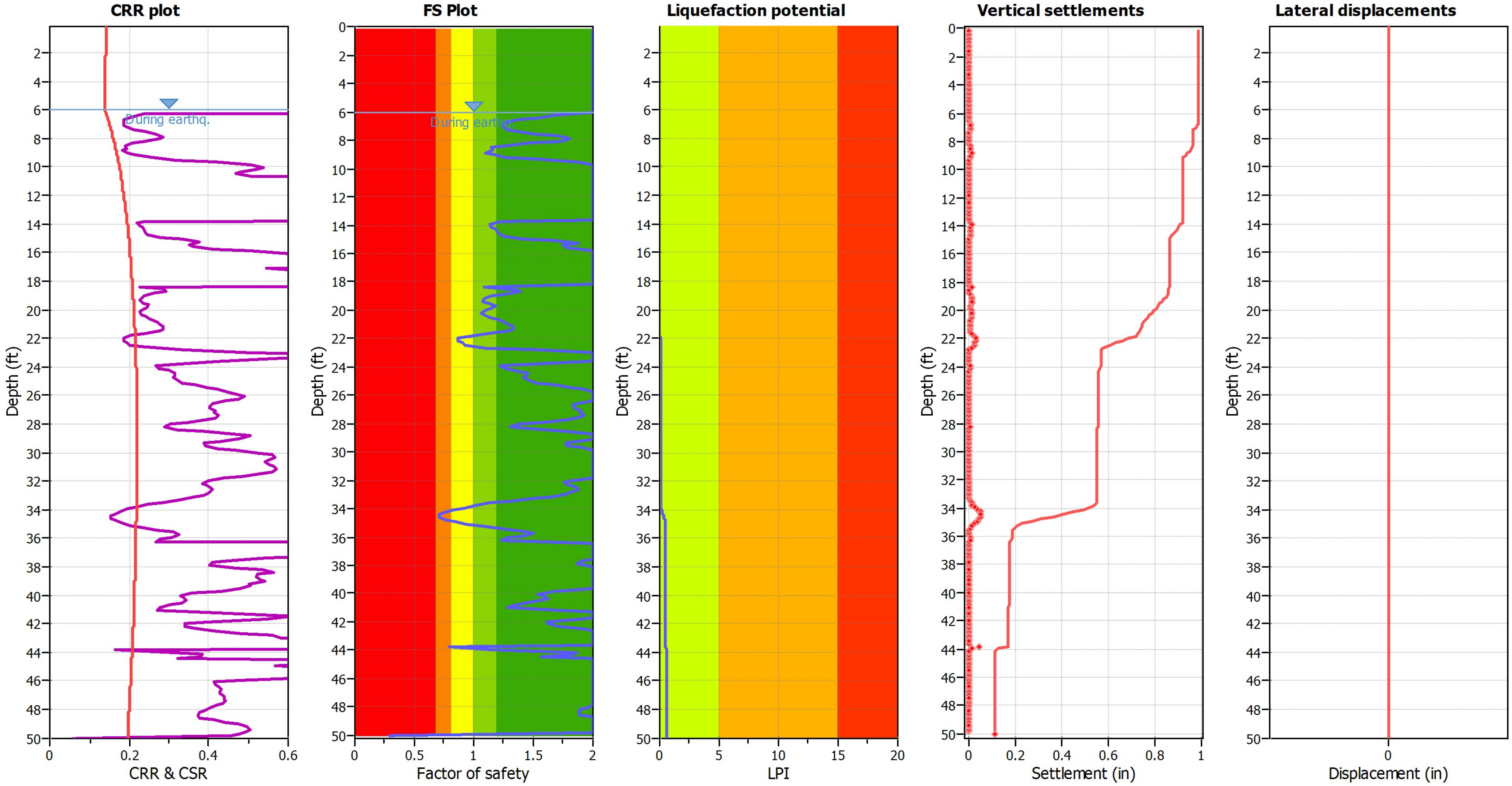






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER 1998	Depth to water table (erthq.):	6.00 ft	Fill weight:	N/A
Fines correction method:	Robertson & Wride	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.25	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	6.00 ft	Fill height:	N/A	Limit depth:	N/A

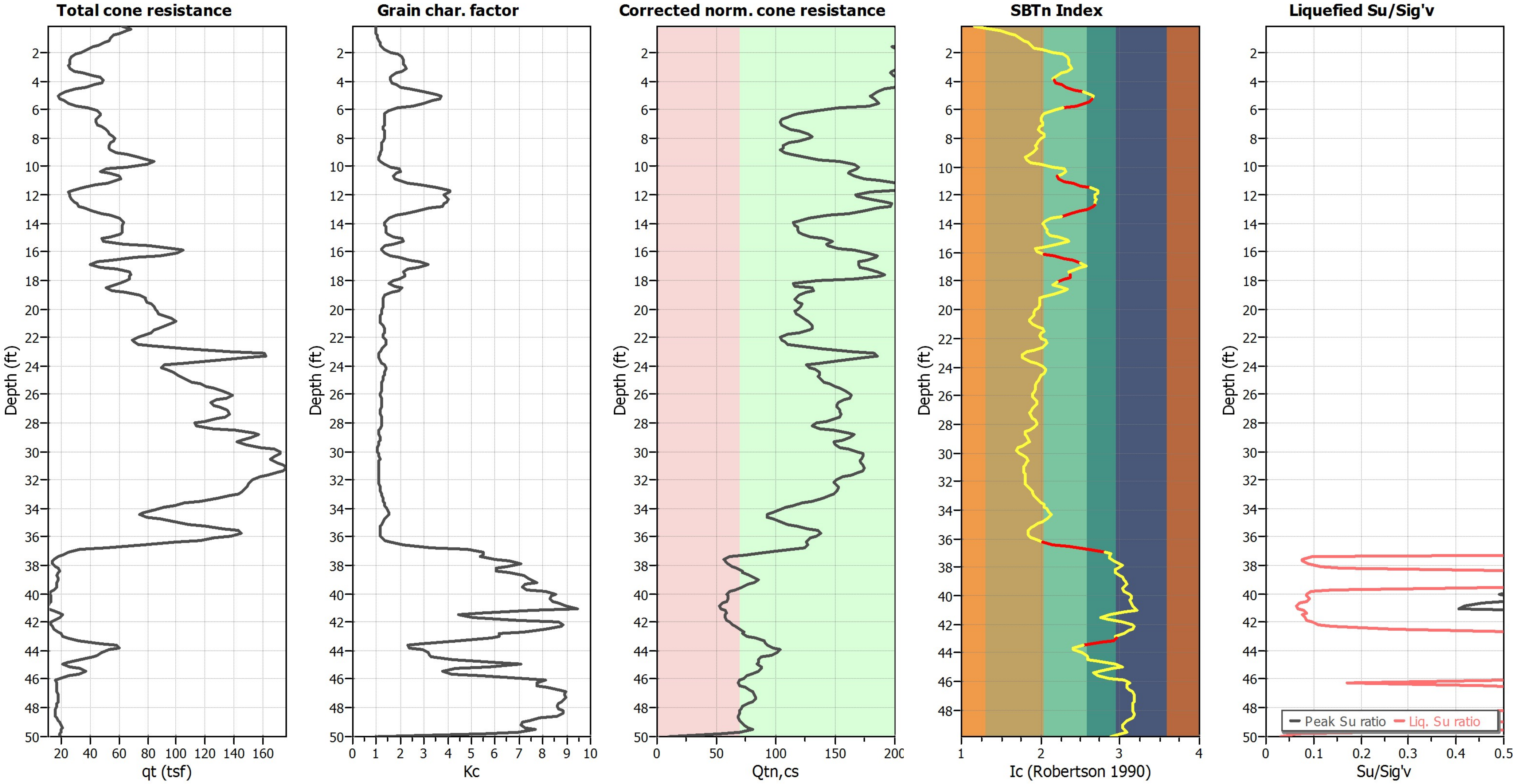
F.S. color scheme

🟥 Almost certain it will liquefy
🟧 Very likely to liquefy
🟨 Liquefaction and no liquefaction are equally likely
🟩 Unlike to liquefy
🟩 Almost certain it will not liquefy

LPI color scheme

🟥 Very high risk
🟧 High risk
🟨 Low risk

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

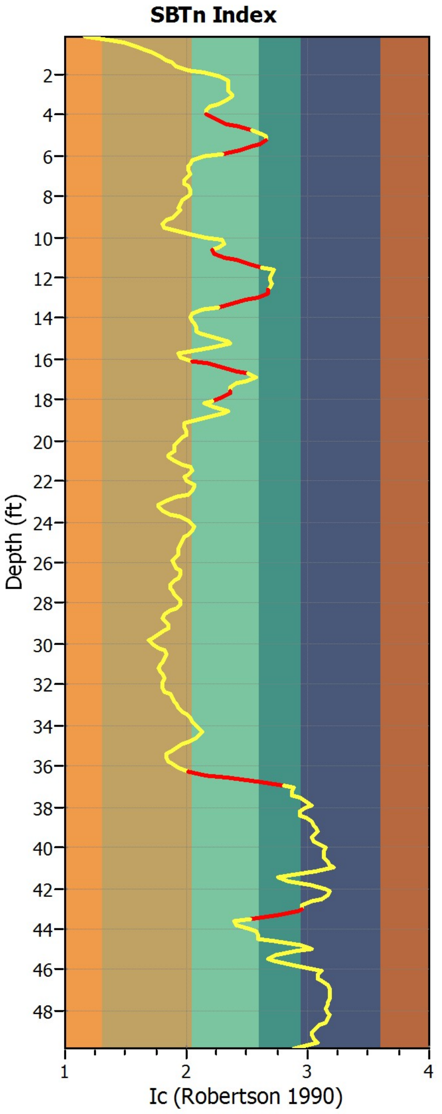
Analysis method: NCEER 1998
Fines correction method: Robertson & Wride
Points to test: Based on Ic value
Earthquake magnitude M_w: 7.10
Peak ground acceleration: 0.25
Depth to water table (insitu): 6.00 ft
Depth to water table (erthq.): 6.00 ft
Average results interval: 3
Ic cut-off value: 2.60
Unit weight calculation: Based on SBT
Use fill: No
Fill height: N/A
Fill weight: N/A
Transition detect. applied: Yes
K_σ applied: No
Clay like behavior applied: All soils
Limit depth applied: No
Limit depth: N/A

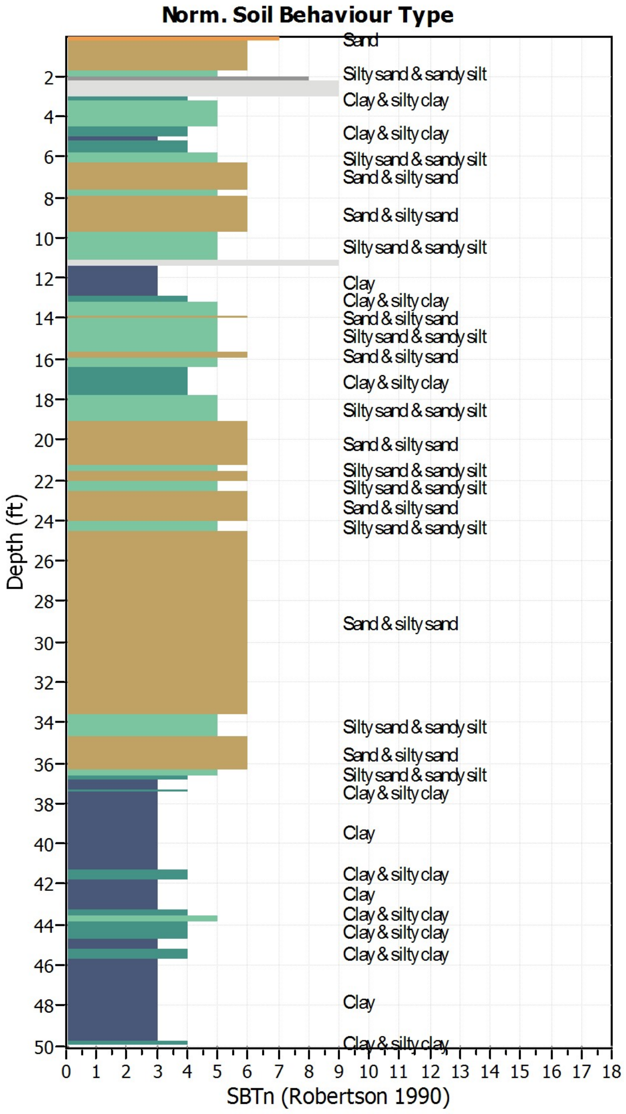
TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between 1.80 < I_c < 3.0) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.





Transition layer algorithm properties

I_c minimum check value:	2.10
I_c maximum check value:	2.92
I_c change ratio value:	0.0250
Minimum number of points in layer:	4

General statistics

Total points in CPT file:	305
Total points excluded:	41
Exclusion percentage:	13.44%
Number of layers detected:	8

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.97	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.92	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.87	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.82	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.77	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.72	0.16	0.00	1.97	2.00	0.00	9.70	0.16	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.62	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.44	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.37	0.16	0.00	4.27	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.32	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.27	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.09	2.00	0.00	9.22	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.17	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.12	0.16	0.00	5.91	2.00	0.00	9.10	0.16	0.00
6.07	2.00	0.00	9.07	0.16	0.00	6.23	1.68	0.00	9.05	0.16	0.00
6.40	1.54	0.00	9.02	0.16	0.00	6.56	1.37	0.00	9.00	0.16	0.00
6.73	1.27	0.00	8.97	0.16	0.00	6.89	1.24	0.00	8.95	0.16	0.00
7.05	1.24	0.00	8.92	0.16	0.00	7.22	1.28	0.00	8.90	0.16	0.00
7.38	1.37	0.00	8.87	0.16	0.00	7.55	1.52	0.00	8.85	0.16	0.00
7.71	1.70	0.00	8.82	0.16	0.00	7.87	1.80	0.00	8.80	0.16	0.00
8.04	1.73	0.00	8.77	0.16	0.00	8.20	1.47	0.00	8.75	0.16	0.00
8.37	1.27	0.00	8.72	0.16	0.00	8.53	1.15	0.00	8.70	0.16	0.00
8.69	1.16	0.00	8.67	0.16	0.00	8.86	1.10	0.00	8.65	0.16	0.00
9.02	1.17	0.00	8.62	0.16	0.00	9.19	1.26	0.00	8.60	0.16	0.00
9.35	1.51	0.00	8.57	0.16	0.00	9.51	1.85	0.00	8.55	0.16	0.00
9.68	2.00	0.00	8.52	0.16	0.00	9.84	2.00	0.00	8.50	0.16	0.00
10.01	2.00	0.00	8.47	0.16	0.00	10.17	2.00	0.00	8.45	0.16	0.00
10.33	2.00	0.00	8.42	0.16	0.00	10.50	2.00	0.00	8.40	0.16	0.00
10.66	2.00	0.00	8.37	0.16	0.00	10.83	2.00	0.00	8.35	0.16	0.00
10.99	2.00	0.00	8.32	0.16	0.00	11.15	2.00	0.00	8.30	0.16	0.00
11.32	2.00	0.00	8.27	0.16	0.00	11.48	2.00	0.00	8.25	0.16	0.00
11.65	2.00	0.00	8.22	0.16	0.00	11.81	2.00	0.00	8.20	0.16	0.00
11.98	2.00	0.00	8.17	0.16	0.00	12.14	2.00	0.00	8.15	0.16	0.00
12.30	2.00	0.00	8.12	0.16	0.00	12.47	2.00	0.00	8.10	0.16	0.00
12.63	2.00	0.00	8.07	0.16	0.00	12.80	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.02	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	2.00	0.00	7.97	0.16	0.00	13.45	2.00	0.00	7.95	0.16	0.00
13.62	2.00	0.00	7.92	0.16	0.00	13.78	1.22	0.00	7.90	0.16	0.00
13.94	1.13	0.00	7.87	0.16	0.00	14.11	1.15	0.00	7.85	0.16	0.00
14.27	1.18	0.00	7.82	0.16	0.00	14.44	1.20	0.00	7.80	0.16	0.00
14.60	1.21	0.00	7.77	0.16	0.00	14.76	1.25	0.00	7.75	0.16	0.00
14.93	1.40	0.00	7.72	0.16	0.00	15.09	1.68	0.00	7.70	0.16	0.00
15.26	1.88	0.00	7.67	0.16	0.00	15.42	1.75	0.00	7.65	0.16	0.00
15.58	1.79	0.00	7.62	0.16	0.00	15.75	2.00	0.00	7.60	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	2.00	0.00	7.57	0.16	0.00	16.08	2.00	0.00	7.55	0.16	0.00
16.24	2.00	0.00	7.52	0.16	0.00	16.40	2.00	0.00	7.50	0.16	0.00
16.57	2.00	0.00	7.47	0.16	0.00	16.73	2.00	0.00	7.45	0.16	0.00
16.90	2.00	0.00	7.42	0.16	0.00	17.06	2.00	0.00	7.40	0.16	0.00
17.22	2.00	0.00	7.37	0.16	0.00	17.39	2.00	0.00	7.35	0.16	0.00
17.55	2.00	0.00	7.32	0.16	0.00	17.72	2.00	0.00	7.30	0.16	0.00
17.88	2.00	0.00	7.27	0.16	0.00	18.04	2.00	0.00	7.25	0.16	0.00
18.21	2.00	0.00	7.22	0.16	0.00	18.37	1.09	0.00	7.20	0.16	0.00
18.54	1.36	0.00	7.17	0.16	0.00	18.70	1.39	0.00	7.15	0.16	0.00
18.86	1.26	0.00	7.12	0.16	0.00	19.03	1.14	0.00	7.10	0.16	0.00
19.19	1.09	0.00	7.07	0.16	0.00	19.36	1.08	0.00	7.05	0.16	0.00
19.52	1.12	0.00	7.02	0.16	0.00	19.69	1.18	0.00	7.00	0.16	0.00
19.85	1.16	0.00	6.97	0.16	0.00	20.01	1.10	0.00	6.95	0.16	0.00
20.18	1.06	0.00	6.92	0.16	0.00	20.34	1.08	0.00	6.90	0.16	0.00
20.51	1.13	0.00	6.87	0.16	0.00	20.67	1.19	0.00	6.85	0.16	0.00
20.83	1.26	0.00	6.82	0.16	0.00	21.00	1.29	0.00	6.80	0.16	0.00
21.16	1.33	0.00	6.77	0.16	0.00	21.33	1.33	0.00	6.75	0.16	0.00
21.49	1.29	0.00	6.72	0.16	0.00	21.65	1.11	0.00	6.70	0.16	0.00
21.82	0.95	0.05	6.67	0.16	0.02	21.98	0.86	0.14	6.65	0.16	0.05
22.15	0.87	0.13	6.62	0.16	0.04	22.31	0.90	0.10	6.60	0.16	0.03
22.47	0.93	0.07	6.57	0.16	0.02	22.64	1.09	0.00	6.55	0.16	0.00
22.80	1.54	0.00	6.52	0.16	0.00	22.97	2.00	0.00	6.50	0.16	0.00
23.13	2.00	0.00	6.47	0.16	0.00	23.29	2.00	0.00	6.45	0.16	0.00
23.46	2.00	0.00	6.42	0.16	0.00	23.62	1.96	0.00	6.40	0.16	0.00
23.79	1.46	0.00	6.37	0.16	0.00	23.95	1.22	0.00	6.35	0.16	0.00
24.11	1.27	0.00	6.32	0.16	0.00	24.28	1.38	0.00	6.30	0.16	0.00
24.44	1.45	0.00	6.27	0.16	0.00	24.61	1.44	0.00	6.25	0.16	0.00
24.77	1.42	0.00	6.22	0.16	0.00	24.93	1.47	0.00	6.20	0.16	0.00
25.10	1.53	0.00	6.17	0.16	0.00	25.26	1.67	0.00	6.15	0.16	0.00
25.43	1.81	0.00	6.12	0.16	0.00	25.59	1.92	0.00	6.10	0.16	0.00
25.75	2.00	0.00	6.07	0.16	0.00	25.92	2.00	0.00	6.05	0.16	0.00
26.08	2.00	0.00	6.02	0.16	0.00	26.25	2.00	0.00	6.00	0.16	0.00
26.41	2.00	0.00	5.97	0.16	0.00	26.57	1.86	0.00	5.95	0.16	0.00
26.74	1.83	0.00	5.92	0.16	0.00	26.90	1.84	0.00	5.90	0.16	0.00
27.07	1.90	0.00	5.87	0.16	0.00	27.23	1.89	0.00	5.85	0.16	0.00
27.40	1.93	0.00	5.82	0.16	0.00	27.56	1.90	0.00	5.80	0.16	0.00
27.72	1.79	0.00	5.77	0.16	0.00	27.89	1.58	0.00	5.75	0.16	0.00
28.05	1.37	0.00	5.72	0.16	0.00	28.22	1.31	0.00	5.70	0.16	0.00
28.38	1.44	0.00	5.67	0.16	0.00	28.54	1.76	0.00	5.65	0.16	0.00
28.71	2.00	0.00	5.62	0.16	0.00	28.87	2.00	0.00	5.60	0.16	0.00
29.04	2.00	0.00	5.57	0.16	0.00	29.20	1.96	0.00	5.55	0.16	0.00
29.36	1.77	0.00	5.52	0.16	0.00	29.53	1.78	0.00	5.50	0.16	0.00
29.69	1.91	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	2.00	0.00	5.27	0.16	0.00	31.17	2.00	0.00	5.25	0.16	0.00
31.33	2.00	0.00	5.22	0.16	0.00	31.50	2.00	0.00	5.20	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	2.00	0.00	5.17	0.16	0.00	31.82	1.99	0.00	5.15	0.16	0.00
31.99	1.82	0.00	5.12	0.16	0.00	32.15	1.75	0.00	5.10	0.16	0.00
32.32	1.80	0.00	5.07	0.16	0.00	32.48	1.86	0.00	5.05	0.16	0.00
32.64	1.87	0.00	5.02	0.16	0.00	32.81	1.84	0.00	5.00	0.16	0.00
32.97	1.77	0.00	4.97	0.16	0.00	33.14	1.67	0.00	4.95	0.16	0.00
33.30	1.51	0.00	4.92	0.16	0.00	33.46	1.31	0.00	4.90	0.16	0.00
33.63	1.13	0.00	4.87	0.16	0.00	33.79	1.01	0.00	4.85	0.16	0.00
33.96	0.91	0.09	4.82	0.16	0.02	34.12	0.82	0.18	4.80	0.16	0.04
34.28	0.75	0.25	4.77	0.16	0.06	34.45	0.71	0.29	4.75	0.16	0.07
34.61	0.71	0.29	4.72	0.16	0.07	34.78	0.76	0.24	4.70	0.16	0.06
34.94	0.84	0.16	4.67	0.16	0.04	35.10	0.94	0.06	4.65	0.16	0.01
35.27	1.06	0.00	4.62	0.16	0.00	35.43	1.24	0.00	4.60	0.16	0.00
35.60	1.44	0.00	4.57	0.16	0.00	35.76	1.50	0.00	4.55	0.16	0.00
35.93	1.41	0.00	4.52	0.16	0.00	36.09	1.29	0.00	4.50	0.16	0.00
36.25	1.24	0.00	4.47	0.16	0.00	36.42	2.00	0.00	4.45	0.16	0.00
36.58	2.00	0.00	4.42	0.16	0.00	36.75	2.00	0.00	4.40	0.16	0.00
36.91	2.00	0.00	4.37	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	2.00	0.00	4.30	0.16	0.00
37.57	2.00	0.00	4.27	0.16	0.00	37.73	1.91	0.00	4.25	0.16	0.00
37.89	1.86	0.00	4.22	0.16	0.00	38.06	2.00	0.00	4.20	0.16	0.00
38.22	2.00	0.00	4.17	0.16	0.00	38.39	2.00	0.00	4.15	0.16	0.00
38.55	2.00	0.00	4.12	0.16	0.00	38.71	2.00	0.00	4.10	0.16	0.00
38.88	2.00	0.00	4.07	0.16	0.00	39.04	2.00	0.00	4.05	0.16	0.00
39.21	2.00	0.00	4.02	0.16	0.00	39.37	2.00	0.00	4.00	0.16	0.00
39.53	2.00	0.00	3.97	0.16	0.00	39.70	2.00	0.00	3.95	0.16	0.00
39.86	1.68	0.00	3.92	0.16	0.00	40.03	1.54	0.00	3.90	0.16	0.00
40.19	1.59	0.00	3.87	0.16	0.00	40.35	1.63	0.00	3.85	0.16	0.00
40.52	1.57	0.00	3.82	0.16	0.00	40.68	1.43	0.00	3.80	0.16	0.00
40.85	1.31	0.00	3.77	0.16	0.00	41.01	1.28	0.00	3.75	0.16	0.00
41.17	1.72	0.00	3.72	0.16	0.00	41.34	2.00	0.00	3.70	0.16	0.00
41.50	2.00	0.00	3.67	0.16	0.00	41.67	2.00	0.00	3.65	0.16	0.00
41.83	1.88	0.00	3.62	0.16	0.00	41.99	1.61	0.00	3.60	0.16	0.00
42.16	1.62	0.00	3.57	0.16	0.00	42.32	1.71	0.00	3.55	0.16	0.00
42.49	1.95	0.00	3.52	0.16	0.00	42.65	2.00	0.00	3.50	0.16	0.00
42.81	2.00	0.00	3.47	0.16	0.00	42.98	2.00	0.00	3.45	0.16	0.00
43.14	2.00	0.00	3.42	0.16	0.00	43.31	2.00	0.00	3.40	0.16	0.00
43.47	2.00	0.00	3.37	0.16	0.00	43.64	2.00	0.00	3.35	0.16	0.00
43.80	0.80	0.20	3.32	0.16	0.03	43.96	1.15	0.00	3.30	0.16	0.00
44.13	1.86	0.00	3.27	0.16	0.00	44.29	1.84	0.00	3.25	0.16	0.00
44.46	1.56	0.00	3.22	0.16	0.00	44.62	2.00	0.00	3.20	0.16	0.00
44.78	2.00	0.00	3.17	0.16	0.00	44.95	2.00	0.00	3.15	0.16	0.00
45.11	2.00	0.00	3.12	0.16	0.00	45.28	2.00	0.00	3.10	0.16	0.00
45.44	2.00	0.00	3.07	0.16	0.00	45.60	2.00	0.00	3.05	0.16	0.00
45.77	2.00	0.00	3.02	0.16	0.00	45.93	2.00	0.00	3.00	0.16	0.00
46.10	2.00	0.00	2.97	0.16	0.00	46.26	2.00	0.00	2.95	0.16	0.00
46.42	2.00	0.00	2.92	0.16	0.00	46.59	2.00	0.00	2.90	0.16	0.00
46.75	2.00	0.00	2.87	0.16	0.00	46.92	2.00	0.00	2.85	0.16	0.00
47.08	2.00	0.00	2.82	0.16	0.00	47.24	2.00	0.00	2.80	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
47.41	2.00	0.00	2.77	0.16	0.00	47.57	2.00	0.00	2.75	0.16	0.00
47.74	2.00	0.00	2.72	0.16	0.00	47.90	2.00	0.00	2.70	0.16	0.00
48.06	1.95	0.00	2.67	0.16	0.00	48.23	1.89	0.00	2.65	0.16	0.00
48.39	1.88	0.00	2.62	0.16	0.00	48.56	1.89	0.00	2.60	0.16	0.00
48.72	2.00	0.00	2.57	0.16	0.00	48.88	2.00	0.00	2.55	0.16	0.00
49.05	2.00	0.00	2.52	0.16	0.00	49.21	2.00	0.00	2.50	0.16	0.00
49.38	2.00	0.00	2.47	0.16	0.00	49.54	2.00	0.00	2.45	0.16	0.00
49.70	2.00	0.00	2.42	0.16	0.00	49.87	2.00	0.00	2.40	0.16	0.00
50.03	0.29	0.71	2.37	0.16	0.08						

Overall liquefaction potential: 0.65

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS:	Calculated factor of safety for test point
F_L:	1 - FS
w_z:	Function value of the extend of soil liquefaction according to depth
d_z:	Layer thickness (ft)
LPI:	Liquefaction potential index value for test point

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Kc	Qc1n	Qc1n,cs	N1,60 (blows)	Vs (ft/s)	Gmax (tsf)	CSR	Shear, γ (%)	Svol,15 (%)	Nc	ev (%)	Settle. (in)
0.16	1.17	1.00	252.37	252.37	40	365.7	218	0.14	0.001	0.00	11.65	0.00	0.000
0.33	1.39	1.00	299.58	299.58	50	439.1	342	0.14	0.001	0.00	11.65	0.00	0.000
0.49	1.49	1.00	285.39	285.39	50	456.2	374	0.14	0.001	0.00	11.65	0.00	0.000
0.66	1.60	1.00	262.21	262.21	47	469.9	401	0.14	0.001	0.00	11.65	0.00	0.000
0.82	1.67	1.02	242.40	246.68	46	476.4	413	0.14	0.002	0.00	11.65	0.00	0.000
0.98	1.73	1.06	228.04	240.68	45	484.9	430	0.14	0.002	0.00	11.65	0.00	0.000
1.15	1.79	1.10	219.25	240.55	46	497.6	456	0.14	0.002	0.00	11.65	0.00	0.000
1.31	1.84	1.14	204.60	233.31	46	501.9	465	0.14	0.003	0.00	11.65	0.00	0.000
1.48	1.88	1.17	183.25	214.77	43	491.7	444	0.14	0.003	0.00	11.65	0.00	0.000
1.64	1.92	1.21	163.36	197.66	40	481.9	424	0.14	0.004	0.00	11.65	0.00	0.000
1.80	2.02	1.32	152.64	202.21	42	488.5	438	0.14	0.004	0.00	11.65	0.00	0.000
1.97	2.15	1.56	144.04	224.46	50	502.0	469	0.14	0.004	0.00	11.65	0.00	0.000
2.13	2.27	1.86	129.46	240.98	56	502.7	472	0.14	0.004	0.00	11.65	0.00	0.000
2.30	2.34	2.07	115.51	239.54	57	495.6	457	0.14	0.005	0.00	11.65	0.00	0.000
2.46	2.35	2.13	106.20	225.78	54	489.4	444	0.14	0.005	0.00	11.65	0.00	0.000
2.62	2.35	2.11	101.68	214.22	51	490.0	444	0.14	0.006	0.00	11.65	0.00	0.000
2.79	2.35	2.13	98.14	208.67	50	493.1	449	0.14	0.006	0.00	11.65	0.00	0.000
2.95	2.37	2.20	92.99	204.98	50	494.4	451	0.14	0.007	0.00	11.65	0.00	0.000
3.12	2.38	2.24	90.54	202.76	49	499.2	461	0.14	0.007	0.00	11.65	0.00	0.000
3.28	2.33	2.07	95.90	198.11	47	516.3	495	0.14	0.007	0.00	11.65	0.00	0.000
3.44	2.26	1.84	107.07	196.57	46	543.1	552	0.14	0.006	0.00	11.65	0.00	0.000
3.61	2.20	1.67	119.52	199.35	45	571.7	617	0.14	0.006	0.00	11.65	0.00	0.000
3.77	2.16	1.58	128.76	202.85	45	594.7	673	0.14	0.005	0.00	11.65	0.00	0.000
3.94	2.17	1.59	129.91	206.12	46	607.2	704	0.14	0.005	0.00	11.65	0.00	0.000
4.10	2.20	1.66	125.01	207.50	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
4.27	2.26	1.82	113.18	205.61	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
4.43	2.33	2.03	98.13	199.56	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
4.59	2.42	2.40	79.81	191.26	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
4.76	2.54	2.98	62.16	185.34	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
4.92	2.63	3.51	51.67	181.52	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
5.09	2.66	3.70	48.47	179.28	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
5.25	2.65	3.65	50.01	182.49	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
5.41	2.61	3.36	54.87	184.39	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
5.58	2.55	3.02	61.66	186.06	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
5.74	2.44	2.50	71.42	178.38	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000
5.91	2.29	1.91	80.35	153.57	0	0.0	0	0.14	0.000	0.00	0.00	0.00	0.000

Total estimated settlement: 0.00

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
6.07	134.97	2.00	0.00	0.00	6.23	119.47	1.68	0.00	0.00
6.40	115.24	1.54	0.00	0.00	6.56	108.66	1.37	0.00	0.00
6.73	105.15	1.27	0.28	0.01	6.89	104.26	1.24	0.39	0.01
7.05	105.14	1.24	0.39	0.01	7.22	107.35	1.28	0.27	0.01
7.38	112.17	1.37	0.00	0.00	7.55	118.90	1.52	0.00	0.00
7.71	126.36	1.70	0.00	0.00	7.87	130.51	1.80	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
8.04	128.57	1.73	0.00	0.00	8.20	119.11	1.47	0.00	0.00
8.37	110.98	1.27	0.27	0.01	8.53	105.63	1.15	0.39	0.01
8.69	106.60	1.16	0.39	0.01	8.86	103.87	1.10	0.54	0.01
9.02	107.76	1.17	0.38	0.01	9.19	112.74	1.26	0.27	0.01
9.35	124.18	1.51	0.00	0.00	9.51	136.86	1.85	0.00	0.00
9.68	153.80	2.00	0.00	0.00	9.84	166.09	2.00	0.00	0.00
10.01	170.03	2.00	0.00	0.00	10.17	168.42	2.00	0.00	0.00
10.33	162.64	2.00	0.00	0.00	10.50	160.78	2.00	0.00	0.00
10.66	166.28	2.00	0.00	0.00	10.83	174.45	2.00	0.00	0.00
10.99	186.44	2.00	0.00	0.00	11.15	202.10	2.00	0.00	0.00
11.32	219.08	2.00	0.00	0.00	11.48	395.32	2.00	0.00	0.00
11.65	198.27	2.00	0.00	0.00	11.81	179.09	2.00	0.00	0.00
11.98	390.78	2.00	0.00	0.00	12.14	406.80	2.00	0.00	0.00
12.30	179.27	2.00	0.00	0.00	12.47	473.23	2.00	0.00	0.00
12.63	455.26	2.00	0.00	0.00	12.80	430.54	2.00	0.00	0.00
12.96	277.60	2.00	0.00	0.00	13.12	174.35	2.00	0.00	0.00
13.29	160.46	2.00	0.00	0.00	13.45	144.12	2.00	0.00	0.00
13.62	128.47	2.00	0.00	0.00	13.78	119.05	1.22	0.36	0.01
13.94	114.91	1.13	0.50	0.01	14.11	116.12	1.15	0.36	0.01
14.27	117.99	1.18	0.36	0.01	14.44	118.87	1.20	0.36	0.01
14.60	119.76	1.21	0.36	0.01	14.76	121.51	1.25	0.35	0.01
14.93	128.80	1.40	0.00	0.00	15.09	139.89	1.68	0.00	0.00
15.26	147.00	1.88	0.00	0.00	15.42	142.71	1.75	0.00	0.00
15.58	144.24	1.79	0.00	0.00	15.75	152.30	2.00	0.00	0.00
15.91	165.29	2.00	0.00	0.00	16.08	177.39	2.00	0.00	0.00
16.24	185.55	2.00	0.00	0.00	16.40	184.72	2.00	0.00	0.00
16.57	176.76	2.00	0.00	0.00	16.73	177.11	2.00	0.00	0.00
16.90	240.36	2.00	0.00	0.00	17.06	171.06	2.00	0.00	0.00
17.22	176.92	2.00	0.00	0.00	17.39	185.96	2.00	0.00	0.00
17.55	191.65	2.00	0.00	0.00	17.72	187.39	2.00	0.00	0.00
17.88	164.30	2.00	0.00	0.00	18.04	134.92	2.00	0.00	0.00
18.21	114.07	2.00	0.00	0.00	18.37	116.41	1.09	0.50	0.01
18.54	129.93	1.36	0.00	0.00	18.70	131.37	1.39	0.00	0.00
18.86	125.28	1.26	0.25	0.00	19.03	119.65	1.14	0.49	0.01
19.19	116.96	1.09	0.50	0.01	19.36	116.32	1.08	0.50	0.01
19.52	118.66	1.12	0.49	0.01	19.69	122.27	1.18	0.35	0.01
19.85	120.90	1.16	0.35	0.01	20.01	117.82	1.10	0.50	0.01
20.18	116.14	1.06	0.50	0.01	20.34	117.37	1.08	0.50	0.01
20.51	120.07	1.13	0.49	0.01	20.67	123.11	1.19	0.35	0.01
20.83	126.70	1.26	0.24	0.00	21.00	128.23	1.29	0.24	0.00
21.16	130.00	1.33	0.24	0.00	21.33	130.28	1.33	0.24	0.00
21.49	128.44	1.29	0.24	0.00	21.65	119.56	1.11	0.49	0.01
21.82	109.85	0.95	1.36	0.03	21.98	104.26	0.86	1.47	0.03
22.15	104.96	0.87	1.46	0.03	22.31	107.39	0.90	1.41	0.03
22.47	109.31	0.93	1.37	0.03	22.64	119.00	1.09	0.49	0.01
22.80	139.52	1.54	0.00	0.00	22.97	164.85	2.00	0.00	0.00
23.13	183.35	2.00	0.00	0.00	23.29	185.46	2.00	0.00	0.00
23.46	174.02	2.00	0.00	0.00	23.62	155.07	1.96	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
23.79	136.73	1.46	0.00	0.00	23.95	125.87	1.22	0.35	0.01
24.11	128.11	1.27	0.24	0.00	24.28	133.19	1.38	0.00	0.00
24.44	136.44	1.45	0.00	0.00	24.61	136.08	1.44	0.00	0.00
24.77	135.14	1.42	0.00	0.00	24.93	137.21	1.47	0.00	0.00
25.10	139.83	1.53	0.00	0.00	25.26	145.27	1.67	0.00	0.00
25.43	150.34	1.81	0.00	0.00	25.59	154.07	1.92	0.00	0.00
25.75	157.96	2.00	0.00	0.00	25.92	161.96	2.00	0.00	0.00
26.08	163.93	2.00	0.00	0.00	26.25	162.01	2.00	0.00	0.00
26.41	157.16	2.00	0.00	0.00	26.57	152.28	1.86	0.00	0.00
26.74	151.14	1.83	0.00	0.00	26.90	151.46	1.84	0.00	0.00
27.07	153.70	1.90	0.00	0.00	27.23	153.19	1.89	0.00	0.00
27.40	154.57	1.93	0.00	0.00	27.56	153.73	1.90	0.00	0.00
27.72	150.11	1.79	0.00	0.00	27.89	142.13	1.58	0.00	0.00
28.05	133.72	1.37	0.00	0.00	28.22	130.71	1.31	0.24	0.00
28.38	136.57	1.44	0.00	0.00	28.54	149.08	1.76	0.00	0.00
28.71	160.70	2.00	0.00	0.00	28.87	165.81	2.00	0.00	0.00
29.04	162.67	2.00	0.00	0.00	29.20	155.69	1.96	0.00	0.00
29.36	149.23	1.77	0.00	0.00	29.53	149.59	1.78	0.00	0.00
29.69	154.03	1.91	0.00	0.00	29.86	160.91	2.00	0.00	0.00
30.02	168.18	2.00	0.00	0.00	30.18	172.76	2.00	0.00	0.00
30.35	173.68	2.00	0.00	0.00	30.51	171.61	2.00	0.00	0.00
30.68	170.69	2.00	0.00	0.00	30.84	171.91	2.00	0.00	0.00
31.00	173.29	2.00	0.00	0.00	31.17	174.25	2.00	0.00	0.00
31.33	172.96	2.00	0.00	0.00	31.50	169.67	2.00	0.00	0.00
31.66	163.64	2.00	0.00	0.00	31.82	156.69	1.99	0.00	0.00
31.99	150.78	1.82	0.00	0.00	32.15	148.48	1.75	0.00	0.00
32.32	149.99	1.80	0.00	0.00	32.48	152.01	1.86	0.00	0.00
32.64	152.62	1.87	0.00	0.00	32.81	151.47	1.84	0.00	0.00
32.97	149.14	1.77	0.00	0.00	33.14	145.24	1.67	0.00	0.00
33.30	138.95	1.51	0.00	0.00	33.46	130.59	1.31	0.24	0.00
33.63	121.68	1.13	0.49	0.01	33.79	114.61	1.01	0.78	0.02
33.96	108.42	0.91	1.39	0.03	34.12	102.34	0.82	1.96	0.04
34.28	96.24	0.75	2.41	0.05	34.45	92.55	0.71	2.49	0.05
34.61	93.17	0.71	2.48	0.05	34.78	97.54	0.76	2.11	0.04
34.94	103.64	0.84	1.93	0.04	35.10	109.96	0.94	1.36	0.03
35.27	117.40	1.06	0.50	0.01	35.43	126.96	1.24	0.34	0.01
35.60	135.55	1.44	0.00	0.00	35.76	138.19	1.50	0.00	0.00
35.93	134.50	1.41	0.00	0.00	36.09	128.75	1.29	0.24	0.00
36.25	126.35	1.24	0.34	0.01	36.42	125.67	2.00	0.00	0.00
36.58	126.45	2.00	0.00	0.00	36.75	192.67	2.00	0.00	0.00
36.91	113.04	2.00	0.00	0.00	37.07	92.74	2.00	0.00	0.00
37.24	74.57	2.00	0.00	0.00	37.40	61.48	2.00	0.00	0.00
37.57	56.29	2.00	0.00	0.00	37.73	56.82	1.91	0.00	0.00
37.89	59.67	1.86	0.01	0.00	38.06	63.93	2.00	0.00	0.00
38.22	67.51	2.00	0.00	0.00	38.39	71.34	2.00	0.00	0.00
38.55	72.40	2.00	0.00	0.00	38.71	78.26	2.00	0.00	0.00
38.88	82.39	2.00	0.00	0.00	39.04	85.25	2.00	0.00	0.00
39.21	81.33	2.00	0.00	0.00	39.37	76.68	2.00	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
39.53	71.39	2.00	0.00	0.00	39.70	66.30	2.00	0.00	0.00
39.86	60.77	1.68	0.02	0.00	40.03	58.75	1.54	0.04	0.00
40.19	59.27	1.59	0.03	0.00	40.35	60.24	1.63	0.03	0.00
40.52	58.62	1.57	0.04	0.00	40.68	55.01	1.43	0.06	0.00
40.85	52.25	1.31	0.10	0.00	41.01	53.86	1.28	0.11	0.00
41.17	57.45	1.72	0.02	0.00	41.34	59.08	2.00	0.00	0.00
41.50	56.93	2.00	0.00	0.00	41.67	57.88	2.00	0.00	0.00
41.83	58.61	1.88	0.01	0.00	41.99	61.58	1.61	0.03	0.00
42.16	63.44	1.62	0.03	0.00	42.32	66.25	1.71	0.02	0.00
42.49	69.46	1.95	0.00	0.00	42.65	72.82	2.00	0.00	0.00
42.81	72.51	2.00	0.00	0.00	42.98	75.24	2.00	0.00	0.00
43.14	82.84	2.00	0.00	0.00	43.31	90.04	2.00	0.00	0.00
43.47	106.49	2.00	0.00	0.00	43.64	92.46	2.00	0.00	0.00
43.80	97.31	0.80	2.11	0.04	43.96	119.25	1.15	0.49	0.01
44.13	148.71	1.86	0.00	0.00	44.29	147.86	1.84	0.00	0.00
44.46	137.46	1.56	0.00	0.00	44.62	85.84	2.00	0.00	0.00
44.78	85.00	2.00	0.00	0.00	44.95	84.41	2.00	0.00	0.00
45.11	87.35	2.00	0.00	0.00	45.28	87.87	2.00	0.00	0.00
45.44	188.38	2.00	0.00	0.00	45.60	79.82	2.00	0.00	0.00
45.77	76.00	2.00	0.00	0.00	45.93	73.00	2.00	0.00	0.00
46.10	69.86	2.00	0.00	0.00	46.26	68.00	2.00	0.00	0.00
46.42	69.84	2.00	0.00	0.00	46.59	74.12	2.00	0.00	0.00
46.75	77.84	2.00	0.00	0.00	46.92	80.64	2.00	0.00	0.00
47.08	82.15	2.00	0.00	0.00	47.24	82.92	2.00	0.00	0.00
47.41	82.43	2.00	0.00	0.00	47.57	80.20	2.00	0.00	0.00
47.74	76.31	2.00	0.00	0.00	47.90	72.36	2.00	0.00	0.00
48.06	70.80	1.95	0.00	0.00	48.23	70.07	1.89	0.01	0.00
48.39	69.46	1.88	0.01	0.00	48.56	67.88	1.89	0.01	0.00
48.72	67.79	2.00	0.00	0.00	48.88	69.14	2.00	0.00	0.00
49.05	71.29	2.00	0.00	0.00	49.21	73.64	2.00	0.00	0.00
49.38	76.84	2.00	0.00	0.00	49.54	80.14	2.00	0.00	0.00
49.70	69.21	2.00	0.00	0.00	49.87	53.37	2.00	0.00	0.00
50.03	9.24	0.29	5.80	0.11					

Total estimated settlement: 0.99

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
Settlement:	Calculated settlement

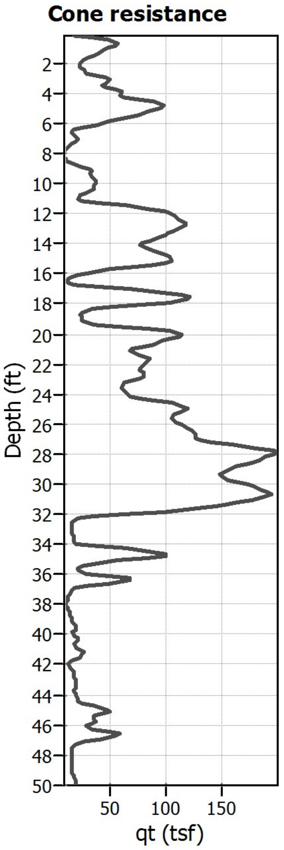
LIQUEFACTION ANALYSIS REPORT

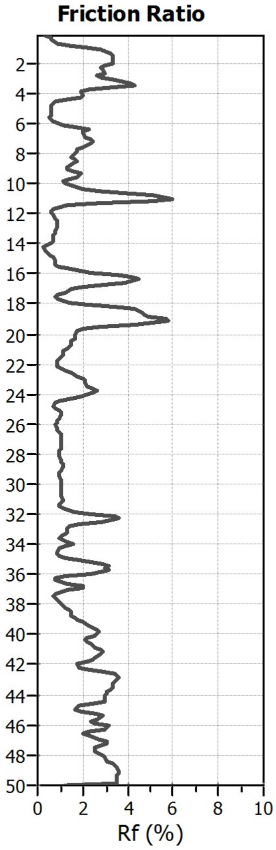
Project title : Lemoore Student Center **Location : West Hills College**

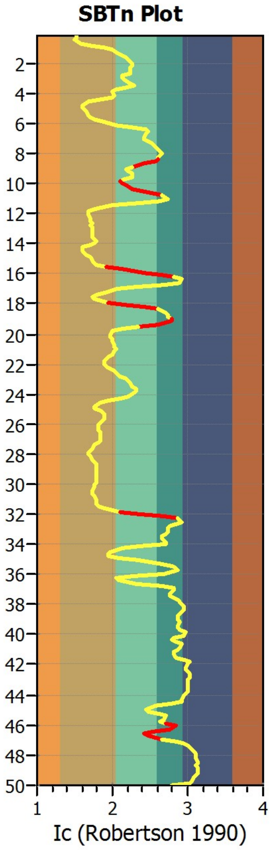
CPT file : SE Corner

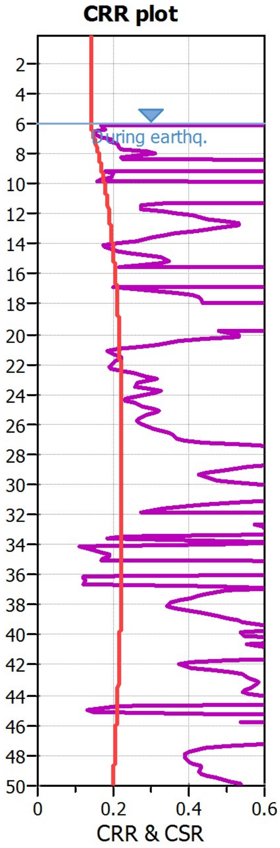
Input parameters and analysis data

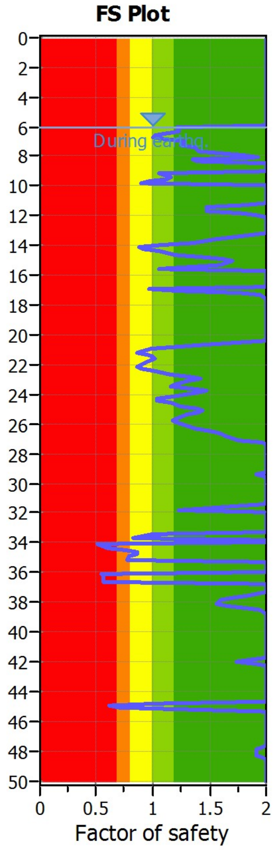
Analysis method:	NCEER 1998	G.W.T. (in-situ):	6.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson & Wride	G.W.T. (earthq.):	6.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.10	Ic cut-off value:	2.60	Trans. detect. applied:	Yes		
Peak ground acceleration:	0.25	Unit weight calculation:	Based on SBT	K_σ applied:	No		

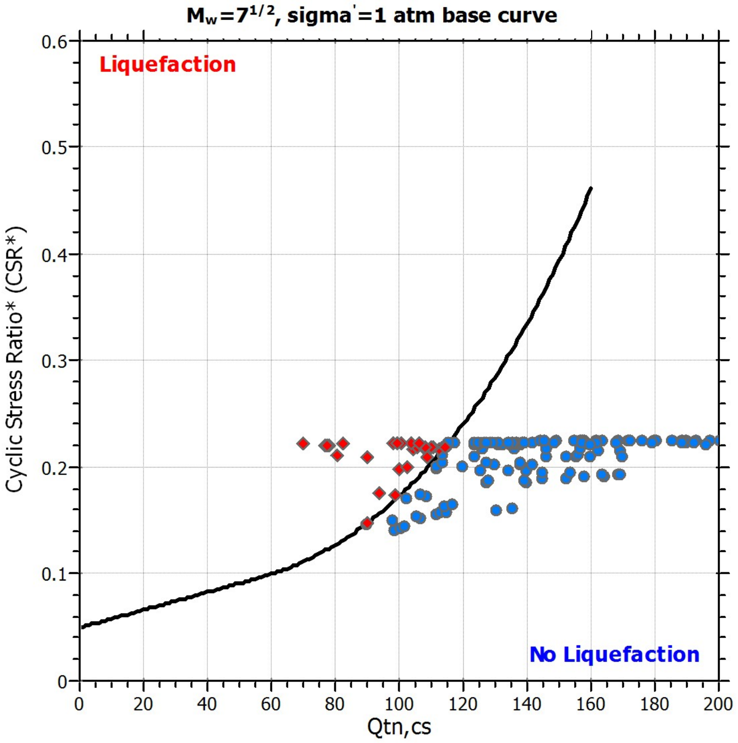


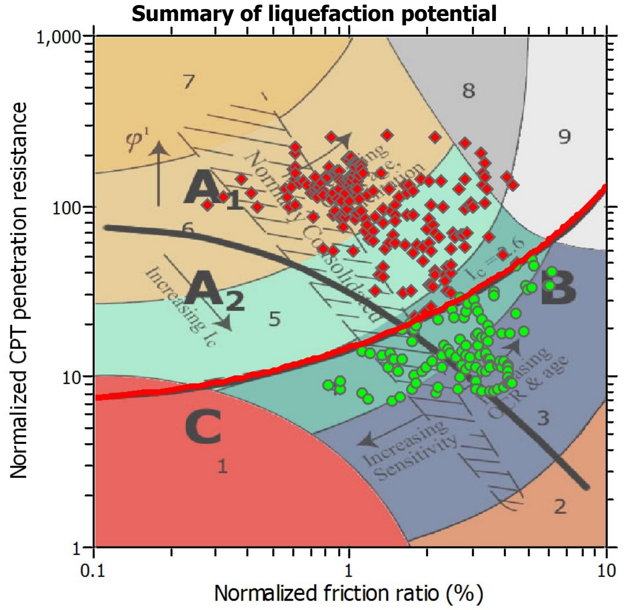












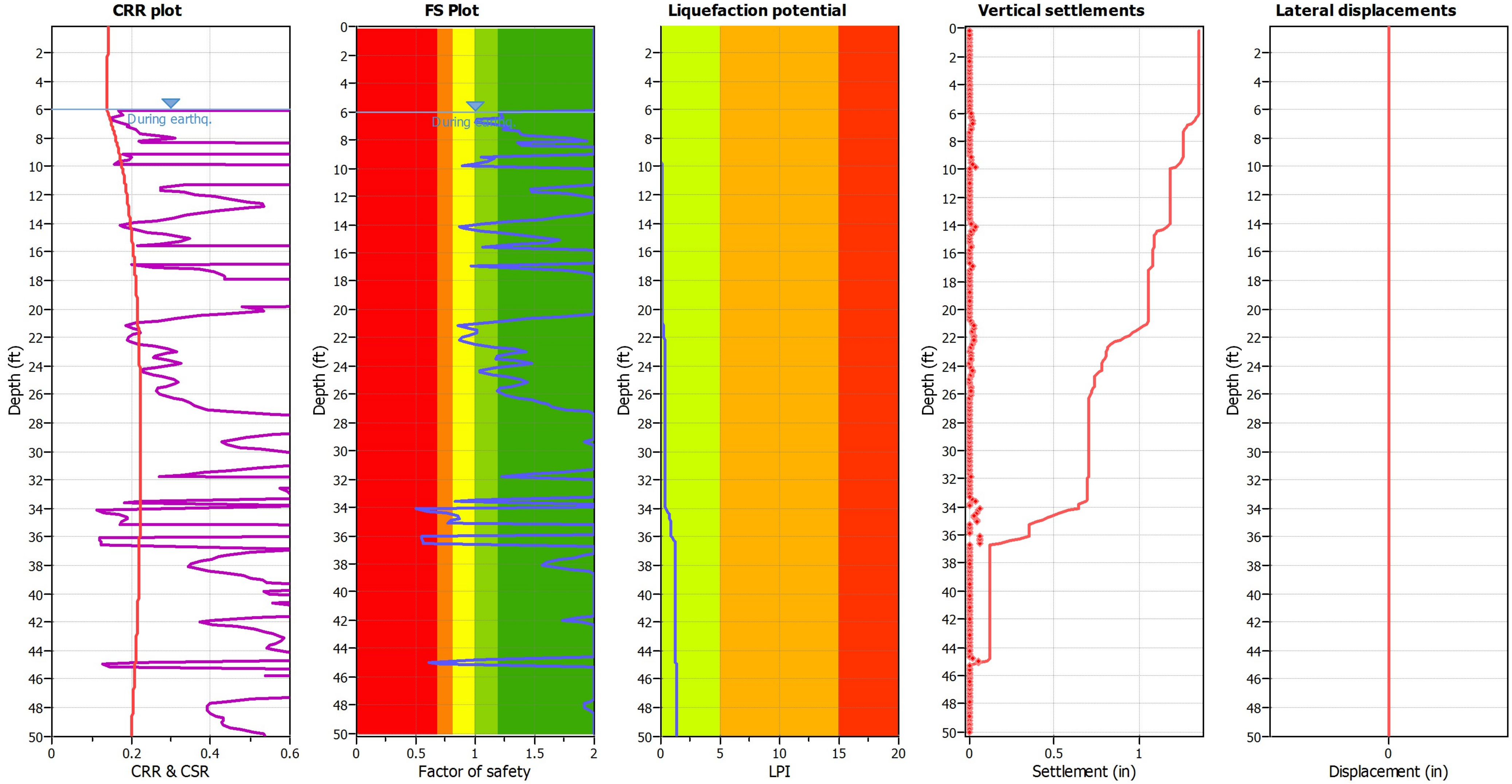
Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading

Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry

Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening

Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER 1998	Depth to water table (erthq.):	6.00 ft	Fill weight:	N/A
Fines correction method:	Robertson & Wride	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.25	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	6.00 ft	Fill height:	N/A	Limit depth:	N/A

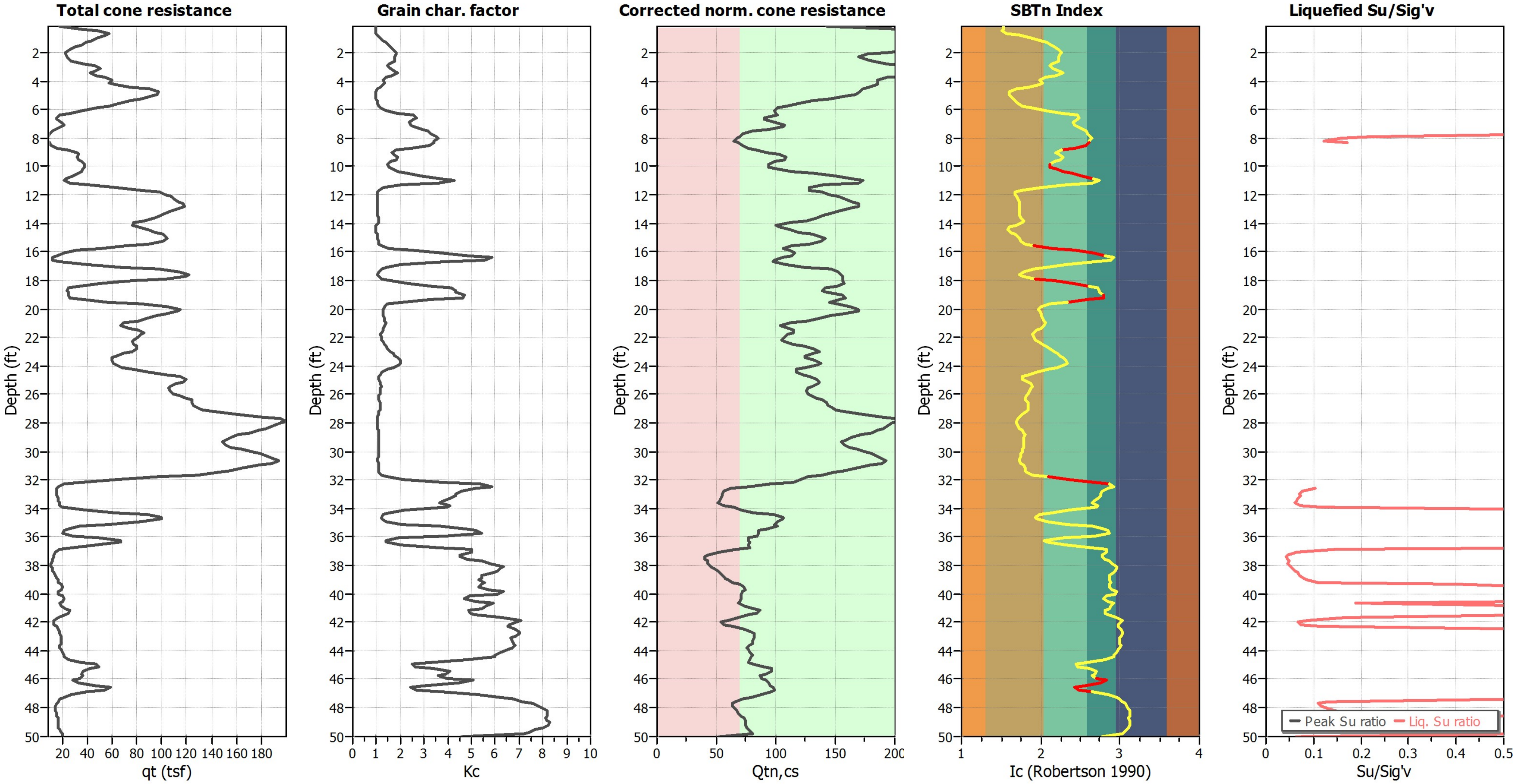
F.S. color scheme

- 🟥 Almost certain it will liquefy
- 🟧 Very likely to liquefy
- 🟨 Liquefaction and no liquefaction are equally likely
- 🟩 Unlike to liquefy
- 🟩 Almost certain it will not liquefy

LPI color scheme

- 🟥 Very high risk
- 🟧 High risk
- 🟨 Low risk

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	NCEER 1998	Depth to water table (erthq.):	6.00 ft	Fill weight:	N/A
Fines correction method:	Robertson & Wride	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.25	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	6.00 ft	Fill height:	N/A	Limit depth:	N/A

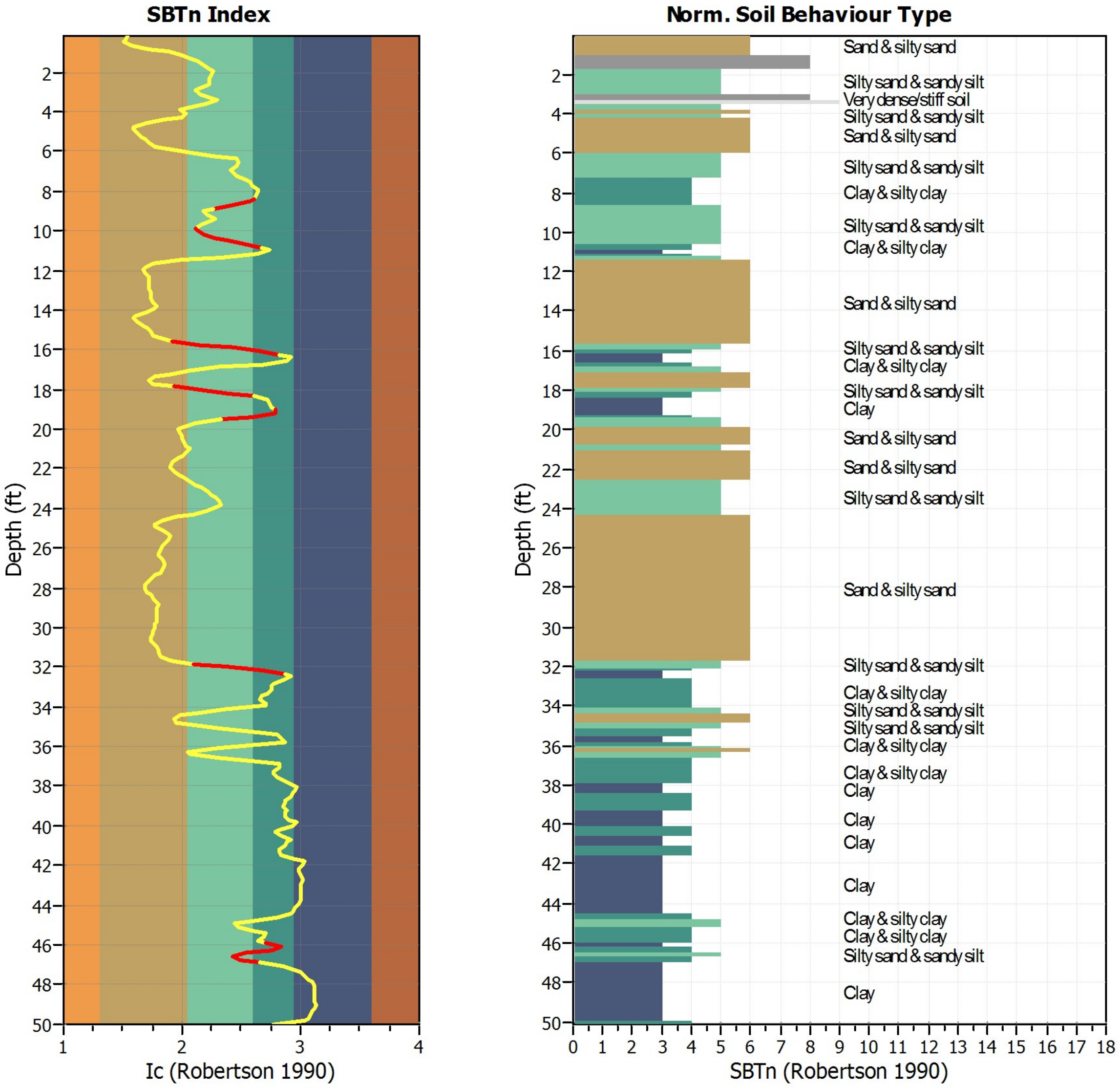
TRANSITION LAYER DETECTION ALGORITHM REPORT

Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties

I_c minimum check value:	2.10
I_c maximum check value:	2.92
I_c change ratio value:	0.0250
Minimum number of points in layer:	4

General statistics

Total points in CPT file:	305
Total points excluded:	36
Exclusion percentage:	11.80%
Number of layers detected:	8

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.97	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.92	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.87	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.82	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.77	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.72	0.16	0.00	1.97	2.00	0.00	9.70	0.16	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.62	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.44	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.37	0.16	0.00	4.27	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.32	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.27	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.09	2.00	0.00	9.22	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.17	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.12	0.16	0.00	5.91	2.00	0.00	9.10	0.16	0.00
6.07	1.21	0.00	9.07	0.16	0.00	6.23	1.22	0.00	9.05	0.16	0.00
6.40	1.23	0.00	9.02	0.16	0.00	6.56	1.02	0.00	9.00	0.16	0.00
6.73	1.00	0.00	8.97	0.16	0.00	6.89	1.13	0.00	8.95	0.16	0.00
7.05	1.28	0.00	8.92	0.16	0.00	7.22	1.24	0.00	8.90	0.16	0.00
7.38	1.37	0.00	8.87	0.16	0.00	7.55	1.38	0.00	8.85	0.16	0.00
7.71	1.41	0.00	8.82	0.16	0.00	7.87	1.80	0.00	8.80	0.16	0.00
8.04	1.94	0.00	8.77	0.16	0.00	8.20	1.35	0.00	8.75	0.16	0.00
8.37	1.39	0.00	8.72	0.16	0.00	8.53	2.00	0.00	8.70	0.16	0.00
8.69	2.00	0.00	8.67	0.16	0.00	8.86	2.00	0.00	8.65	0.16	0.00
9.02	2.00	0.00	8.62	0.16	0.00	9.19	1.05	0.00	8.60	0.16	0.00
9.35	1.16	0.00	8.57	0.16	0.00	9.51	1.11	0.00	8.55	0.16	0.00
9.68	0.97	0.03	8.52	0.16	0.01	9.84	0.89	0.11	8.50	0.16	0.05
10.01	2.00	0.00	8.47	0.16	0.00	10.17	2.00	0.00	8.45	0.16	0.00
10.33	2.00	0.00	8.42	0.16	0.00	10.50	2.00	0.00	8.40	0.16	0.00
10.66	2.00	0.00	8.37	0.16	0.00	10.83	2.00	0.00	8.35	0.16	0.00
10.99	2.00	0.00	8.32	0.16	0.00	11.15	2.00	0.00	8.30	0.16	0.00
11.32	1.82	0.00	8.27	0.16	0.00	11.48	1.47	0.00	8.25	0.16	0.00
11.65	1.48	0.00	8.22	0.16	0.00	11.81	1.76	0.00	8.20	0.16	0.00
11.98	1.92	0.00	8.17	0.16	0.00	12.14	2.00	0.00	8.15	0.16	0.00
12.30	2.00	0.00	8.12	0.16	0.00	12.47	2.00	0.00	8.10	0.16	0.00
12.63	2.00	0.00	8.07	0.16	0.00	12.80	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.02	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	1.87	0.00	7.97	0.16	0.00	13.45	1.72	0.00	7.95	0.16	0.00
13.62	1.56	0.00	7.92	0.16	0.00	13.78	1.34	0.00	7.90	0.16	0.00
13.94	1.06	0.00	7.87	0.16	0.00	14.11	0.87	0.13	7.85	0.16	0.05
14.27	0.91	0.09	7.82	0.16	0.04	14.44	1.05	0.00	7.80	0.16	0.00
14.60	1.20	0.00	7.77	0.16	0.00	14.76	1.41	0.00	7.75	0.16	0.00
14.93	1.61	0.00	7.72	0.16	0.00	15.09	1.71	0.00	7.70	0.16	0.00
15.26	1.60	0.00	7.67	0.16	0.00	15.42	1.34	0.00	7.65	0.16	0.00
15.58	1.06	0.00	7.62	0.16	0.00	15.75	2.00	0.00	7.60	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	2.00	0.00	7.57	0.16	0.00	16.08	2.00	0.00	7.55	0.16	0.00
16.24	2.00	0.00	7.52	0.16	0.00	16.40	2.00	0.00	7.50	0.16	0.00
16.57	2.00	0.00	7.47	0.16	0.00	16.73	2.00	0.00	7.45	0.16	0.00
16.90	0.96	0.04	7.42	0.16	0.02	17.06	1.23	0.00	7.40	0.16	0.00
17.22	1.77	0.00	7.37	0.16	0.00	17.39	1.95	0.00	7.35	0.16	0.00
17.55	2.00	0.00	7.32	0.16	0.00	17.72	2.00	0.00	7.30	0.16	0.00
17.88	2.00	0.00	7.27	0.16	0.00	18.04	2.00	0.00	7.25	0.16	0.00
18.21	2.00	0.00	7.22	0.16	0.00	18.37	2.00	0.00	7.20	0.16	0.00
18.54	2.00	0.00	7.17	0.16	0.00	18.70	2.00	0.00	7.15	0.16	0.00
18.86	2.00	0.00	7.12	0.16	0.00	19.03	2.00	0.00	7.10	0.16	0.00
19.19	2.00	0.00	7.07	0.16	0.00	19.36	2.00	0.00	7.05	0.16	0.00
19.52	2.00	0.00	7.02	0.16	0.00	19.69	2.00	0.00	7.00	0.16	0.00
19.85	2.00	0.00	6.97	0.16	0.00	20.01	2.00	0.00	6.95	0.16	0.00
20.18	2.00	0.00	6.92	0.16	0.00	20.34	2.00	0.00	6.90	0.16	0.00
20.51	1.72	0.00	6.87	0.16	0.00	20.67	1.45	0.00	6.85	0.16	0.00
20.83	1.23	0.00	6.82	0.16	0.00	21.00	0.97	0.03	6.80	0.16	0.01
21.16	0.85	0.15	6.77	0.16	0.05	21.33	0.95	0.05	6.75	0.16	0.02
21.49	1.01	0.00	6.72	0.16	0.00	21.65	1.02	0.00	6.70	0.16	0.00
21.82	0.93	0.07	6.67	0.16	0.02	21.98	0.89	0.11	6.65	0.16	0.04
22.15	0.86	0.14	6.62	0.16	0.05	22.31	0.90	0.10	6.60	0.16	0.03
22.47	1.00	0.00	6.57	0.16	0.00	22.64	1.16	0.00	6.55	0.16	0.00
22.80	1.32	0.00	6.52	0.16	0.00	22.97	1.43	0.00	6.50	0.16	0.00
23.13	1.32	0.00	6.47	0.16	0.00	23.29	1.18	0.00	6.45	0.16	0.00
23.46	1.17	0.00	6.42	0.16	0.00	23.62	1.34	0.00	6.40	0.16	0.00
23.79	1.48	0.00	6.37	0.16	0.00	23.95	1.39	0.00	6.35	0.16	0.00
24.11	1.17	0.00	6.32	0.16	0.00	24.28	1.04	0.00	6.30	0.16	0.00
24.44	1.04	0.00	6.27	0.16	0.00	24.61	1.15	0.00	6.25	0.16	0.00
24.77	1.25	0.00	6.22	0.16	0.00	24.93	1.38	0.00	6.20	0.16	0.00
25.10	1.43	0.00	6.17	0.16	0.00	25.26	1.40	0.00	6.15	0.16	0.00
25.43	1.30	0.00	6.12	0.16	0.00	25.59	1.21	0.00	6.10	0.16	0.00
25.75	1.18	0.00	6.07	0.16	0.00	25.92	1.21	0.00	6.05	0.16	0.00
26.08	1.26	0.00	6.02	0.16	0.00	26.25	1.37	0.00	6.00	0.16	0.00
26.41	1.47	0.00	5.97	0.16	0.00	26.57	1.55	0.00	5.95	0.16	0.00
26.74	1.61	0.00	5.92	0.16	0.00	26.90	1.65	0.00	5.90	0.16	0.00
27.07	1.75	0.00	5.87	0.16	0.00	27.23	1.96	0.00	5.85	0.16	0.00
27.40	2.00	0.00	5.82	0.16	0.00	27.56	2.00	0.00	5.80	0.16	0.00
27.72	2.00	0.00	5.77	0.16	0.00	27.89	2.00	0.00	5.75	0.16	0.00
28.05	2.00	0.00	5.72	0.16	0.00	28.22	2.00	0.00	5.70	0.16	0.00
28.38	2.00	0.00	5.67	0.16	0.00	28.54	2.00	0.00	5.65	0.16	0.00
28.71	2.00	0.00	5.62	0.16	0.00	28.87	2.00	0.00	5.60	0.16	0.00
29.04	2.00	0.00	5.57	0.16	0.00	29.20	2.00	0.00	5.55	0.16	0.00
29.36	1.91	0.00	5.52	0.16	0.00	29.53	1.98	0.00	5.50	0.16	0.00
29.69	2.00	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	2.00	0.00	5.27	0.16	0.00	31.17	2.00	0.00	5.25	0.16	0.00
31.33	1.98	0.00	5.22	0.16	0.00	31.50	1.72	0.00	5.20	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	1.48	0.00	5.17	0.16	0.00	31.82	1.22	0.00	5.15	0.16	0.00
31.99	2.00	0.00	5.12	0.16	0.00	32.15	2.00	0.00	5.10	0.16	0.00
32.32	2.00	0.00	5.07	0.16	0.00	32.48	2.00	0.00	5.05	0.16	0.00
32.64	2.00	0.00	5.02	0.16	0.00	32.81	2.00	0.00	5.00	0.16	0.00
32.97	2.00	0.00	4.97	0.16	0.00	33.14	2.00	0.00	4.95	0.16	0.00
33.30	2.00	0.00	4.92	0.16	0.00	33.46	1.01	0.00	4.90	0.16	0.00
33.63	0.83	0.17	4.87	0.16	0.04	33.79	2.00	0.00	4.85	0.16	0.00
33.96	2.00	0.00	4.82	0.16	0.00	34.12	0.50	0.50	4.80	0.16	0.12
34.28	0.59	0.41	4.77	0.16	0.10	34.45	0.75	0.25	4.75	0.16	0.06
34.61	0.86	0.14	4.72	0.16	0.03	34.78	0.86	0.14	4.70	0.16	0.03
34.94	0.79	0.21	4.67	0.16	0.05	35.10	0.77	0.23	4.65	0.16	0.05
35.27	2.00	0.00	4.62	0.16	0.00	35.43	2.00	0.00	4.60	0.16	0.00
35.60	2.00	0.00	4.57	0.16	0.00	35.76	2.00	0.00	4.55	0.16	0.00
35.93	2.00	0.00	4.52	0.16	0.00	36.09	0.55	0.45	4.50	0.16	0.10
36.25	0.55	0.45	4.47	0.16	0.10	36.42	0.56	0.44	4.45	0.16	0.10
36.58	0.56	0.44	4.42	0.16	0.10	36.75	2.00	0.00	4.40	0.16	0.00
36.91	2.00	0.00	4.37	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	1.91	0.00	4.30	0.16	0.00
37.57	1.83	0.00	4.27	0.16	0.00	37.73	1.70	0.00	4.25	0.16	0.00
37.89	1.59	0.00	4.22	0.16	0.00	38.06	1.56	0.00	4.20	0.16	0.00
38.22	1.65	0.00	4.17	0.16	0.00	38.39	1.80	0.00	4.15	0.16	0.00
38.55	1.95	0.00	4.12	0.16	0.00	38.71	2.00	0.00	4.10	0.16	0.00
38.88	2.00	0.00	4.07	0.16	0.00	39.04	2.00	0.00	4.05	0.16	0.00
39.21	2.00	0.00	4.02	0.16	0.00	39.37	2.00	0.00	4.00	0.16	0.00
39.53	2.00	0.00	3.97	0.16	0.00	39.70	2.00	0.00	3.95	0.16	0.00
39.86	2.00	0.00	3.92	0.16	0.00	40.03	2.00	0.00	3.90	0.16	0.00
40.19	2.00	0.00	3.87	0.16	0.00	40.35	2.00	0.00	3.85	0.16	0.00
40.52	2.00	0.00	3.82	0.16	0.00	40.68	2.00	0.00	3.80	0.16	0.00
40.85	2.00	0.00	3.77	0.16	0.00	41.01	2.00	0.00	3.75	0.16	0.00
41.17	2.00	0.00	3.72	0.16	0.00	41.34	2.00	0.00	3.70	0.16	0.00
41.50	2.00	0.00	3.67	0.16	0.00	41.67	2.00	0.00	3.65	0.16	0.00
41.83	1.87	0.00	3.62	0.16	0.00	41.99	1.73	0.00	3.60	0.16	0.00
42.16	1.89	0.00	3.57	0.16	0.00	42.32	2.00	0.00	3.55	0.16	0.00
42.49	2.00	0.00	3.52	0.16	0.00	42.65	2.00	0.00	3.50	0.16	0.00
42.81	2.00	0.00	3.47	0.16	0.00	42.98	2.00	0.00	3.45	0.16	0.00
43.14	2.00	0.00	3.42	0.16	0.00	43.31	2.00	0.00	3.40	0.16	0.00
43.47	2.00	0.00	3.37	0.16	0.00	43.64	2.00	0.00	3.35	0.16	0.00
43.80	2.00	0.00	3.32	0.16	0.00	43.96	2.00	0.00	3.30	0.16	0.00
44.13	2.00	0.00	3.27	0.16	0.00	44.29	2.00	0.00	3.25	0.16	0.00
44.46	2.00	0.00	3.22	0.16	0.00	44.62	2.00	0.00	3.20	0.16	0.00
44.78	1.03	0.00	3.17	0.16	0.00	44.95	0.61	0.39	3.15	0.16	0.06
45.11	0.70	0.30	3.12	0.16	0.05	45.28	2.00	0.00	3.10	0.16	0.00
45.44	2.00	0.00	3.07	0.16	0.00	45.60	2.00	0.00	3.05	0.16	0.00
45.77	2.00	0.00	3.02	0.16	0.00	45.93	2.00	0.00	3.00	0.16	0.00
46.10	2.00	0.00	2.97	0.16	0.00	46.26	2.00	0.00	2.95	0.16	0.00
46.42	2.00	0.00	2.92	0.16	0.00	46.59	2.00	0.00	2.90	0.16	0.00
46.75	2.00	0.00	2.87	0.16	0.00	46.92	2.00	0.00	2.85	0.16	0.00
47.08	2.00	0.00	2.82	0.16	0.00	47.24	2.00	0.00	2.80	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
47.41	2.00	0.00	2.77	0.16	0.00	47.57	2.00	0.00	2.75	0.16	0.00
47.74	1.96	0.00	2.72	0.16	0.00	47.90	1.91	0.00	2.70	0.16	0.00
48.06	1.92	0.00	2.67	0.16	0.00	48.23	1.92	0.00	2.65	0.16	0.00
48.39	1.96	0.00	2.62	0.16	0.00	48.56	2.00	0.00	2.60	0.16	0.00
48.72	2.00	0.00	2.57	0.16	0.00	48.88	2.00	0.00	2.55	0.16	0.00
49.05	2.00	0.00	2.52	0.16	0.00	49.21	2.00	0.00	2.50	0.16	0.00
49.38	2.00	0.00	2.47	0.16	0.00	49.54	2.00	0.00	2.45	0.16	0.00
49.70	2.00	0.00	2.42	0.16	0.00	49.87	2.00	0.00	2.40	0.16	0.00
50.03	2.00	0.00	2.37	0.16	0.00						

Overall liquefaction potential: 1.37

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS:	Calculated factor of safety for test point
F_L:	1 - FS
w_z:	Function value of the extend of soil liquefaction according to depth
d_z:	Layer thickness (ft)
LPI:	Liquefaction potential index value for test point

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Kc	Qc1n	Qc1n,cs	N1,60 (blows)	Vs (ft/s)	Gmax (tsf)	CSR	Shear, γ (%)	Svol,15 (%)	Nc	ev (%)	Settle. (in)
0.16	1.54	1.00	143.11	143.11	25	251.5	97	0.14	0.002	0.00	11.65	0.00	0.000
0.33	1.53	1.00	207.47	207.47	37	349.5	206	0.14	0.001	0.00	11.65	0.00	0.000
0.49	1.51	1.00	219.14	219.14	38	398.7	275	0.14	0.002	0.00	11.65	0.00	0.000
0.66	1.57	1.00	250.68	250.68	45	451.4	365	0.14	0.002	0.00	11.65	0.00	0.000
0.82	1.72	1.05	260.74	274.65	52	491.0	445	0.14	0.002	0.00	11.65	0.00	0.000
0.98	1.89	1.18	251.40	295.71	59	509.2	486	0.14	0.002	0.00	11.65	0.00	0.000
1.15	2.00	1.30	231.44	301.71	63	518.9	508	0.14	0.002	0.00	11.65	0.00	0.000
1.31	2.09	1.43	203.87	291.26	63	514.2	499	0.14	0.002	0.00	11.65	0.00	0.000
1.48	2.13	1.50	178.03	267.77	59	503.2	475	0.14	0.003	0.00	11.65	0.00	0.000
1.64	2.17	1.60	149.72	239.90	53	482.1	431	0.14	0.004	0.00	11.65	0.00	0.000
1.80	2.22	1.73	125.21	216.10	49	460.0	387	0.14	0.005	0.00	11.65	0.00	0.000
1.97	2.27	1.85	105.03	194.75	45	438.5	347	0.14	0.006	0.00	11.65	0.00	0.000
2.13	2.25	1.80	98.08	176.98	41	434.2	338	0.14	0.006	0.00	11.65	0.00	0.000
2.30	2.23	1.75	97.11	169.56	39	441.2	349	0.14	0.007	0.00	11.65	0.00	0.000
2.46	2.23	1.74	101.62	177.16	40	462.3	388	0.14	0.006	0.00	11.65	0.00	0.000
2.62	2.23	1.74	104.03	181.26	41	478.5	418	0.14	0.006	0.00	11.65	0.00	0.000
2.79	2.14	1.53	126.39	193.66	43	525.9	514	0.14	0.005	0.00	11.65	0.00	0.000
2.95	2.12	1.49	144.36	215.48	47	570.0	615	0.14	0.004	0.00	11.65	0.00	0.000
3.12	2.16	1.56	157.91	246.98	55	613.9	727	0.14	0.004	0.00	11.65	0.00	0.000
3.28	2.25	1.80	147.11	264.33	61	622.1	751	0.14	0.004	0.00	11.65	0.00	0.000
3.44	2.29	1.91	134.91	258.00	60	614.1	729	0.14	0.004	0.00	11.65	0.00	0.000
3.61	2.19	1.65	134.23	221.64	50	604.4	700	0.14	0.005	0.00	11.65	0.00	0.000
3.77	2.06	1.38	140.42	193.76	41	598.6	680	0.14	0.005	0.00	11.65	0.00	0.000
3.94	1.99	1.29	144.02	185.53	38	601.0	683	0.14	0.005	0.00	11.65	0.00	0.000
4.10	2.03	1.33	139.24	185.87	39	605.9	696	0.14	0.006	0.00	11.65	0.00	0.000
4.27	1.99	1.29	143.25	184.79	38	614.8	717	0.14	0.006	0.00	11.65	0.00	0.000
4.43	1.85	1.15	155.88	178.54	35	615.9	714	0.14	0.006	0.00	11.65	0.00	0.000
4.59	1.69	1.03	168.54	173.41	32	608.4	688	0.14	0.006	0.00	11.65	0.00	0.000
4.76	1.60	1.00	171.08	171.08	31	597.1	655	0.14	0.007	0.00	11.65	0.00	0.000
4.92	1.60	1.00	167.33	167.33	30	595.1	649	0.14	0.007	0.00	11.65	0.00	0.000
5.09	1.62	1.00	158.41	158.41	29	589.5	635	0.14	0.008	0.01	11.65	0.00	0.000
5.25	1.65	1.00	144.19	144.81	27	573.1	595	0.14	0.009	0.01	11.65	0.01	0.000
5.41	1.68	1.03	128.76	132.00	24	552.1	546	0.14	0.010	0.01	11.65	0.01	0.000
5.58	1.72	1.05	113.44	119.03	22	529.6	496	0.14	0.012	0.01	11.65	0.01	0.000
5.74	1.77	1.08	99.91	108.28	21	511.1	457	0.14	0.014	0.01	11.65	0.01	0.000
5.91	1.87	1.16	86.77	100.79	20	500.8	438	0.14	0.015	0.02	11.65	0.01	0.001

Total estimated settlement: 0.00

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
6.07	98.86	1.21	0.41	0.01	6.23	100.43	1.22	0.40	0.01
6.40	101.60	1.23	0.40	0.01	6.56	90.27	1.02	0.97	0.02
6.73	89.72	1.00	0.98	0.02	6.89	98.35	1.13	0.56	0.01
7.05	107.04	1.28	0.28	0.01	7.22	105.52	1.24	0.39	0.01
7.38	112.15	1.37	0.00	0.00	7.55	113.30	1.38	0.00	0.00
7.71	115.25	1.41	0.00	0.00	7.87	130.63	1.80	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
8.04	135.53	1.94	0.00	0.00
8.37	116.67	1.39	0.00	0.00
8.69	77.11	2.00	0.00	0.00
9.02	92.39	2.00	0.00	0.00
9.35	108.78	1.16	0.38	0.01
9.68	98.64	0.97	0.89	0.02
10.01	93.94	2.00	0.00	0.00
10.33	113.24	2.00	0.00	0.00
10.66	170.31	2.00	0.00	0.00
10.99	173.03	2.00	0.00	0.00
11.32	140.15	1.82	0.00	0.00
11.65	128.22	1.48	0.00	0.00
11.98	144.79	1.92	0.00	0.00
12.30	158.39	2.00	0.00	0.00
12.63	169.05	2.00	0.00	0.00
12.96	163.85	2.00	0.00	0.00
13.29	145.05	1.87	0.00	0.00
13.62	134.64	1.56	0.00	0.00
13.94	111.78	1.06	0.51	0.01
14.27	102.56	0.91	1.51	0.03
14.60	119.78	1.20	0.36	0.01
14.93	138.17	1.61	0.00	0.00
15.26	138.02	1.60	0.00	0.00
15.58	113.55	1.06	0.51	0.01
15.91	110.81	2.00	0.00	0.00
16.24	113.71	2.00	0.00	0.00
16.57	99.37	2.00	0.00	0.00
16.90	108.84	0.96	0.82	0.02
17.22	146.09	1.77	0.00	0.00
17.55	155.36	2.00	0.00	0.00
17.88	156.49	2.00	0.00	0.00
18.21	157.17	2.00	0.00	0.00
18.54	140.86	2.00	0.00	0.00
18.86	142.30	2.00	0.00	0.00
19.19	158.30	2.00	0.00	0.00
19.52	144.74	2.00	0.00	0.00
19.85	162.66	2.00	0.00	0.00
20.18	169.49	2.00	0.00	0.00
20.51	146.40	1.72	0.00	0.00
20.83	126.12	1.23	0.34	0.01
21.16	104.21	0.85	1.48	0.03
21.49	114.45	1.01	0.78	0.02
21.82	110.10	0.93	1.36	0.03
22.15	105.36	0.86	1.45	0.03
22.47	114.42	1.00	0.78	0.02
22.80	131.45	1.32	0.24	0.00
23.13	131.21	1.32	0.24	0.00
23.46	124.05	1.17	0.35	0.01
8.20	114.53	1.35	0.00	0.00
8.53	107.56	2.00	0.00	0.00
8.86	82.37	2.00	0.00	0.00
9.19	102.38	1.05	0.54	0.01
9.51	106.74	1.11	0.53	0.01
9.84	93.62	0.89	1.73	0.03
10.17	100.26	2.00	0.00	0.00
10.50	130.94	2.00	0.00	0.00
10.83	359.34	2.00	0.00	0.00
11.15	328.18	2.00	0.00	0.00
11.48	127.46	1.47	0.00	0.00
11.81	139.30	1.76	0.00	0.00
12.14	152.68	2.00	0.00	0.00
12.47	164.52	2.00	0.00	0.00
12.80	169.49	2.00	0.00	0.00
13.12	153.66	2.00	0.00	0.00
13.45	140.07	1.72	0.00	0.00
13.78	125.70	1.34	0.25	0.00
14.11	99.93	0.87	1.57	0.03
14.44	111.95	1.05	0.51	0.01
14.76	130.06	1.41	0.00	0.00
15.09	141.91	1.71	0.00	0.00
15.42	127.44	1.34	0.24	0.00
15.75	106.10	2.00	0.00	0.00
16.08	249.38	2.00	0.00	0.00
16.40	106.33	2.00	0.00	0.00
16.73	233.44	2.00	0.00	0.00
17.06	124.00	1.23	0.35	0.01
17.39	152.47	1.95	0.00	0.00
17.72	156.14	2.00	0.00	0.00
18.04	156.19	2.00	0.00	0.00
18.37	255.04	2.00	0.00	0.00
18.70	138.54	2.00	0.00	0.00
19.03	156.36	2.00	0.00	0.00
19.36	243.95	2.00	0.00	0.00
19.69	150.75	2.00	0.00	0.00
20.01	169.29	2.00	0.00	0.00
20.34	156.56	2.00	0.00	0.00
20.67	136.08	1.45	0.00	0.00
21.00	112.26	0.97	0.79	0.02
21.33	110.62	0.95	1.35	0.03
21.65	115.17	1.02	0.77	0.02
21.98	107.34	0.89	1.41	0.03
22.31	107.87	0.90	1.40	0.03
22.64	123.51	1.16	0.35	0.01
22.97	136.05	1.43	0.00	0.00
23.29	124.94	1.18	0.35	0.01
23.62	132.49	1.34	0.24	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
23.79	138.34	1.48	0.00	0.00	23.95	134.87	1.39	0.00	0.00
24.11	124.33	1.17	0.35	0.01	24.28	117.50	1.04	0.76	0.01
24.44	117.55	1.04	0.76	0.01	24.61	123.59	1.15	0.35	0.01
24.77	128.65	1.25	0.24	0.00	24.93	134.54	1.38	0.00	0.00
25.10	136.89	1.43	0.00	0.00	25.26	135.37	1.40	0.00	0.00
25.43	131.03	1.30	0.24	0.00	25.59	126.64	1.21	0.34	0.01
25.75	125.24	1.18	0.35	0.01	25.92	126.70	1.21	0.34	0.01
26.08	129.33	1.26	0.24	0.00	26.25	134.45	1.37	0.00	0.00
26.41	138.81	1.47	0.00	0.00	26.57	142.15	1.55	0.00	0.00
26.74	144.40	1.61	0.00	0.00	26.90	145.79	1.65	0.00	0.00
27.07	149.61	1.75	0.00	0.00	27.23	156.62	1.96	0.00	0.00
27.40	171.62	2.00	0.00	0.00	27.56	188.78	2.00	0.00	0.00
27.72	200.34	2.00	0.00	0.00	27.89	202.35	2.00	0.00	0.00
28.05	197.70	2.00	0.00	0.00	28.22	193.32	2.00	0.00	0.00
28.38	189.92	2.00	0.00	0.00	28.54	185.89	2.00	0.00	0.00
28.71	180.20	2.00	0.00	0.00	28.87	172.34	2.00	0.00	0.00
29.04	163.79	2.00	0.00	0.00	29.20	158.37	2.00	0.00	0.00
29.36	155.14	1.91	0.00	0.00	29.53	157.47	1.98	0.00	0.00
29.69	161.76	2.00	0.00	0.00	29.86	168.87	2.00	0.00	0.00
30.02	176.05	2.00	0.00	0.00	30.18	180.90	2.00	0.00	0.00
30.35	185.69	2.00	0.00	0.00	30.51	189.99	2.00	0.00	0.00
30.68	192.54	2.00	0.00	0.00	30.84	188.79	2.00	0.00	0.00
31.00	179.61	2.00	0.00	0.00	31.17	167.83	2.00	0.00	0.00
31.33	157.31	1.98	0.00	0.00	31.50	148.47	1.72	0.00	0.00
31.66	139.21	1.48	0.00	0.00	31.82	127.43	1.22	0.34	0.01
31.99	120.30	2.00	0.00	0.00	32.15	261.41	2.00	0.00	0.00
32.32	95.56	2.00	0.00	0.00	32.48	77.17	2.00	0.00	0.00
32.64	62.48	2.00	0.00	0.00	32.81	56.63	2.00	0.00	0.00
32.97	54.84	2.00	0.00	0.00	33.14	55.10	2.00	0.00	0.00
33.30	53.55	2.00	0.00	0.00	33.46	115.79	1.01	0.77	0.02
33.63	103.80	0.83	1.92	0.04	33.79	55.87	2.00	0.00	0.00
33.96	162.12	2.00	0.00	0.00	34.12	70.15	0.50	3.12	0.06
34.28	82.23	0.59	2.74	0.05	34.45	97.82	0.75	2.10	0.04
34.61	106.12	0.86	1.44	0.03	34.78	106.16	0.86	1.44	0.03
34.94	100.76	0.79	2.01	0.04	35.10	99.13	0.77	2.06	0.04
35.27	205.02	2.00	0.00	0.00	35.43	93.28	2.00	0.00	0.00
35.60	85.94	2.00	0.00	0.00	35.76	85.85	2.00	0.00	0.00
35.93	196.17	2.00	0.00	0.00	36.09	76.71	0.55	2.90	0.06
36.25	76.96	0.55	2.90	0.06	36.42	78.27	0.56	2.86	0.06
36.58	77.29	0.56	2.89	0.06	36.75	159.71	2.00	0.00	0.00
36.91	67.03	2.00	0.00	0.00	37.07	52.49	2.00	0.00	0.00
37.24	42.13	2.00	0.00	0.00	37.40	39.90	1.91	0.00	0.00
37.57	40.81	1.83	0.01	0.00	37.73	42.55	1.70	0.02	0.00
37.89	42.53	1.59	0.03	0.00	38.06	45.33	1.56	0.04	0.00
38.22	47.20	1.65	0.02	0.00	38.39	50.68	1.80	0.01	0.00
38.55	52.89	1.95	0.00	0.00	38.71	54.88	2.00	0.00	0.00
38.88	57.13	2.00	0.00	0.00	39.04	59.22	2.00	0.00	0.00
39.21	63.38	2.00	0.00	0.00	39.37	69.78	2.00	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
39.53	73.49	2.00	0.00	0.00	39.70	74.24	2.00	0.00	0.00
39.86	71.39	2.00	0.00	0.00	40.03	70.37	2.00	0.00	0.00
40.19	70.58	2.00	0.00	0.00	40.35	70.71	2.00	0.00	0.00
40.52	69.87	2.00	0.00	0.00	40.68	68.63	2.00	0.00	0.00
40.85	73.31	2.00	0.00	0.00	41.01	81.17	2.00	0.00	0.00
41.17	86.59	2.00	0.00	0.00	41.34	84.64	2.00	0.00	0.00
41.50	77.29	2.00	0.00	0.00	41.67	67.96	2.00	0.00	0.00
41.83	59.51	1.87	0.01	0.00	41.99	53.70	1.73	0.02	0.00
42.16	55.96	1.89	0.01	0.00	42.32	63.56	2.00	0.00	0.00
42.49	72.89	2.00	0.00	0.00	42.65	79.18	2.00	0.00	0.00
42.81	81.81	2.00	0.00	0.00	42.98	82.06	2.00	0.00	0.00
43.14	81.58	2.00	0.00	0.00	43.31	80.94	2.00	0.00	0.00
43.47	79.94	2.00	0.00	0.00	43.64	78.19	2.00	0.00	0.00
43.80	75.84	2.00	0.00	0.00	43.96	76.30	2.00	0.00	0.00
44.13	78.17	2.00	0.00	0.00	44.29	80.13	2.00	0.00	0.00
44.46	79.48	2.00	0.00	0.00	44.62	77.74	2.00	0.00	0.00
44.78	113.81	1.03	0.78	0.02	44.95	80.90	0.61	2.78	0.05
45.11	89.75	0.70	2.55	0.05	45.28	159.87	2.00	0.00	0.00
45.44	96.65	2.00	0.00	0.00	45.60	218.85	2.00	0.00	0.00
45.77	170.26	2.00	0.00	0.00	45.93	224.32	2.00	0.00	0.00
46.10	91.63	2.00	0.00	0.00	46.26	94.19	2.00	0.00	0.00
46.42	119.47	2.00	0.00	0.00	46.59	97.44	2.00	0.00	0.00
46.75	98.51	2.00	0.00	0.00	46.92	199.19	2.00	0.00	0.00
47.08	87.37	2.00	0.00	0.00	47.24	78.96	2.00	0.00	0.00
47.41	71.62	2.00	0.00	0.00	47.57	65.79	2.00	0.00	0.00
47.74	63.30	1.96	0.00	0.00	47.90	63.99	1.91	0.00	0.00
48.06	65.91	1.92	0.00	0.00	48.23	66.61	1.92	0.00	0.00
48.39	68.30	1.96	0.00	0.00	48.56	70.89	2.00	0.00	0.00
48.72	73.23	2.00	0.00	0.00	48.88	74.18	2.00	0.00	0.00
49.05	74.22	2.00	0.00	0.00	49.21	74.34	2.00	0.00	0.00
49.38	75.22	2.00	0.00	0.00	49.54	76.60	2.00	0.00	0.00
49.70	78.93	2.00	0.00	0.00	49.87	80.49	2.00	0.00	0.00
50.03	51.91	2.00	0.00	0.00					

Total estimated settlement: 1.35

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
Settlement:	Calculated settlement

LIQUEFACTION ANALYSIS REPORT

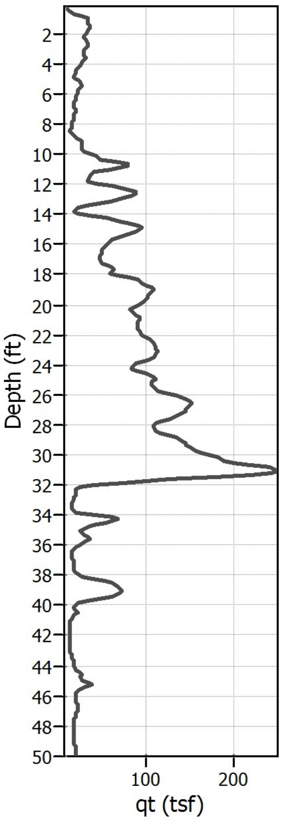
Project title : Lemoore Student Center **Location : West Hills College**

CPT file : SW Corner

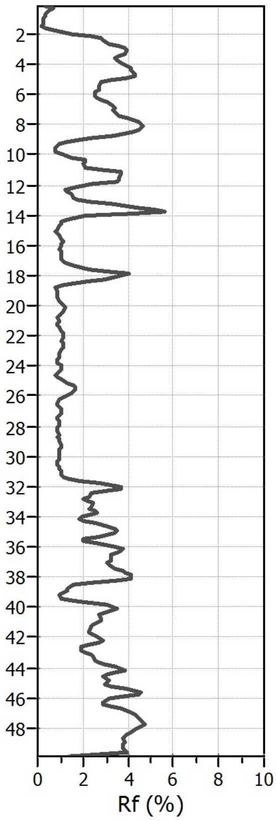
Input parameters and analysis data

Analysis method:	NCEER 1998	G.W.T. (in-situ):	6.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson & Wride	G.W.T. (earthq.):	6.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.10	Ic cut-off value:	2.60	Trans. detect. applied:	Yes		
Peak ground acceleration:	0.25	Unit weight calculation:	Based on SBT	K_σ applied:	No		

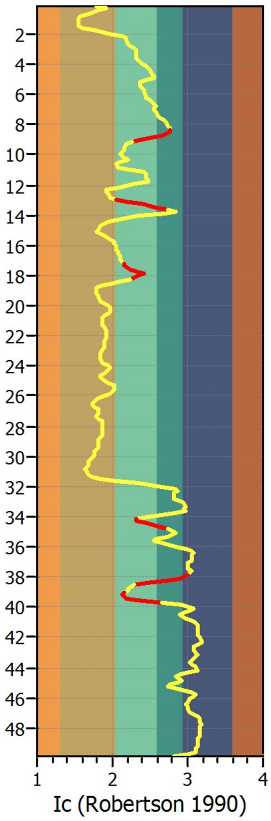
Cone resistance



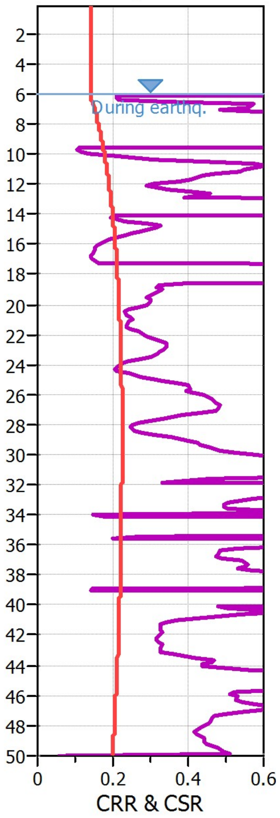
Friction Ratio



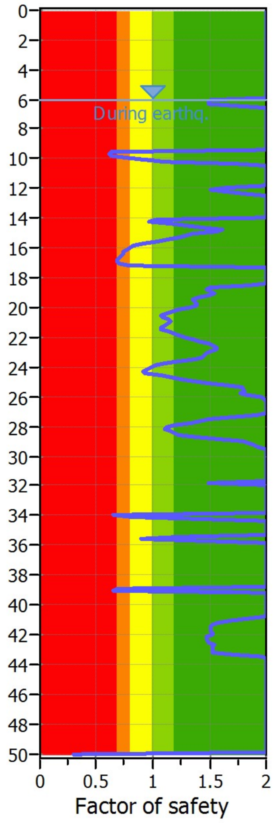
SBTn Plot



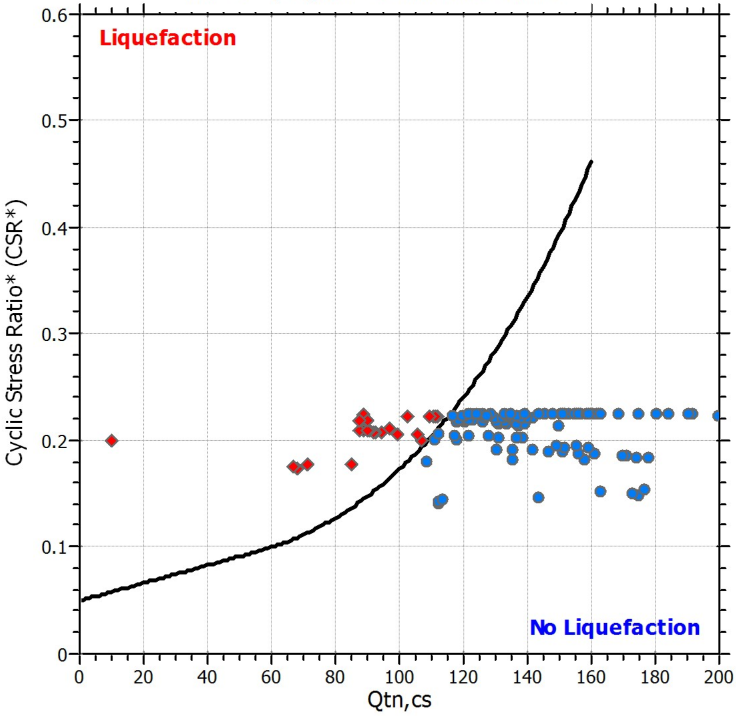
CRR plot



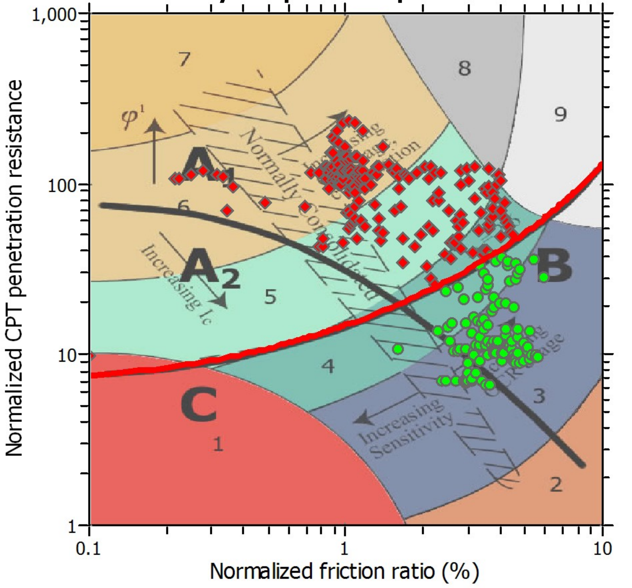
FS Plot



$M_w=7^{1/2}$, sigma'=1 atm base curve

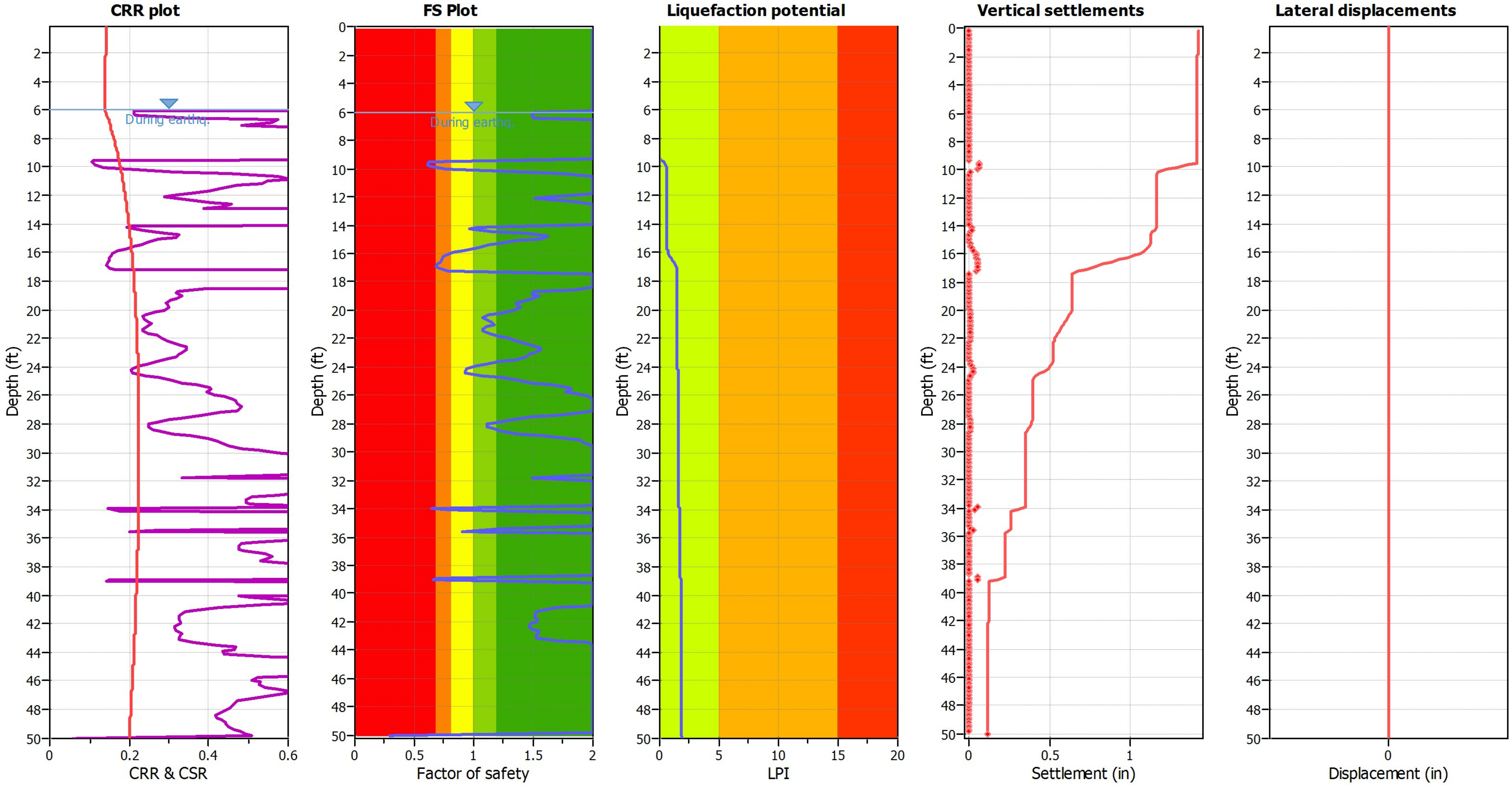


Summary of liquefaction potential



Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER 1998	Depth to water table (erthq.):	6.00 ft	Fill weight:	N/A
Fines correction method:	Robertson & Wride	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.25	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	6.00 ft	Fill height:	N/A	Limit depth:	N/A

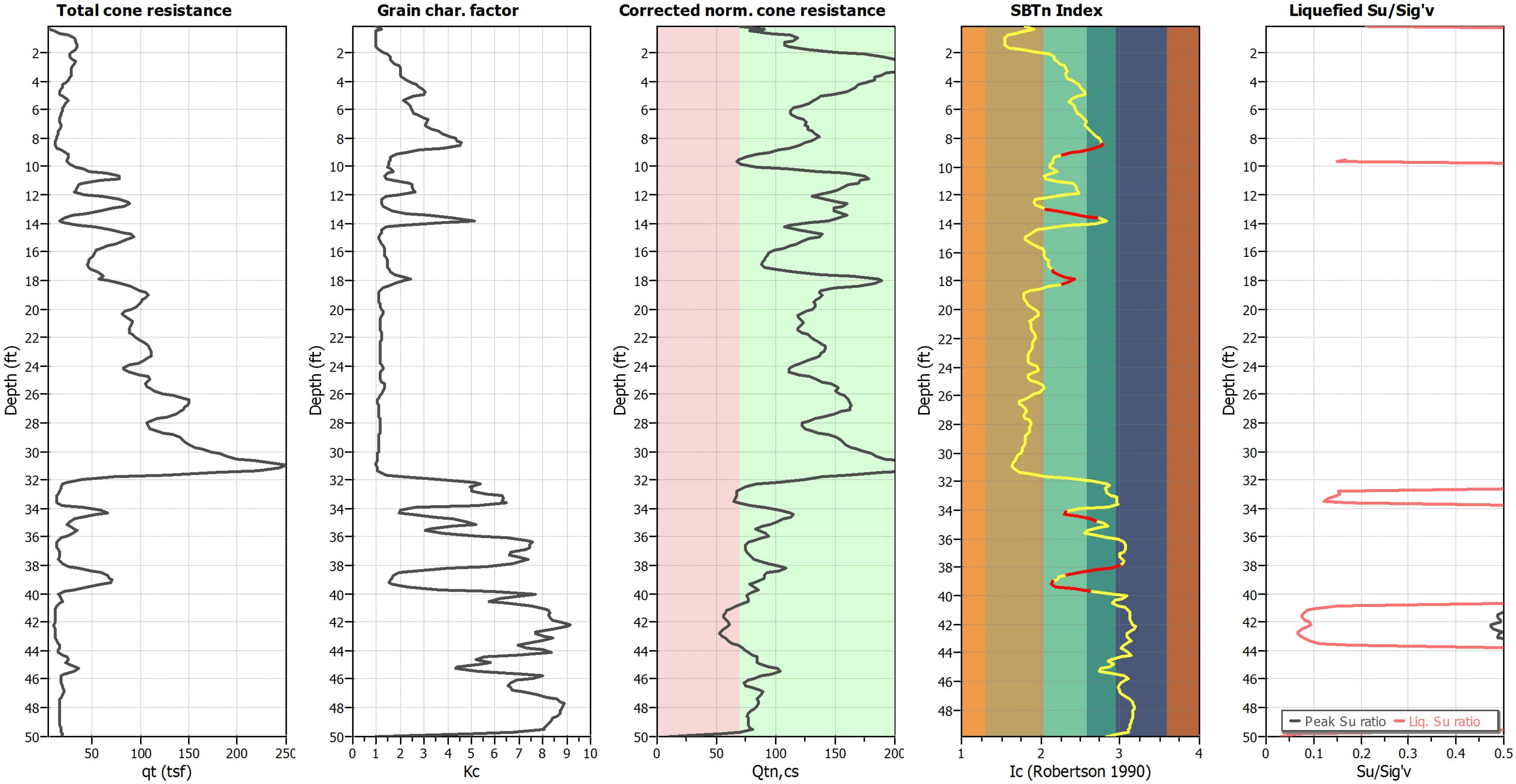
F.S. color scheme

🟥 Almost certain it will liquefy
🟧 Very likely to liquefy
🟨 Liquefaction and no liquefaction are equally likely
🟩 Unlike to liquefy
🟩 Almost certain it will not liquefy

LPI color scheme

🟥 Very high risk
🟧 High risk
🟨 Low risk

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

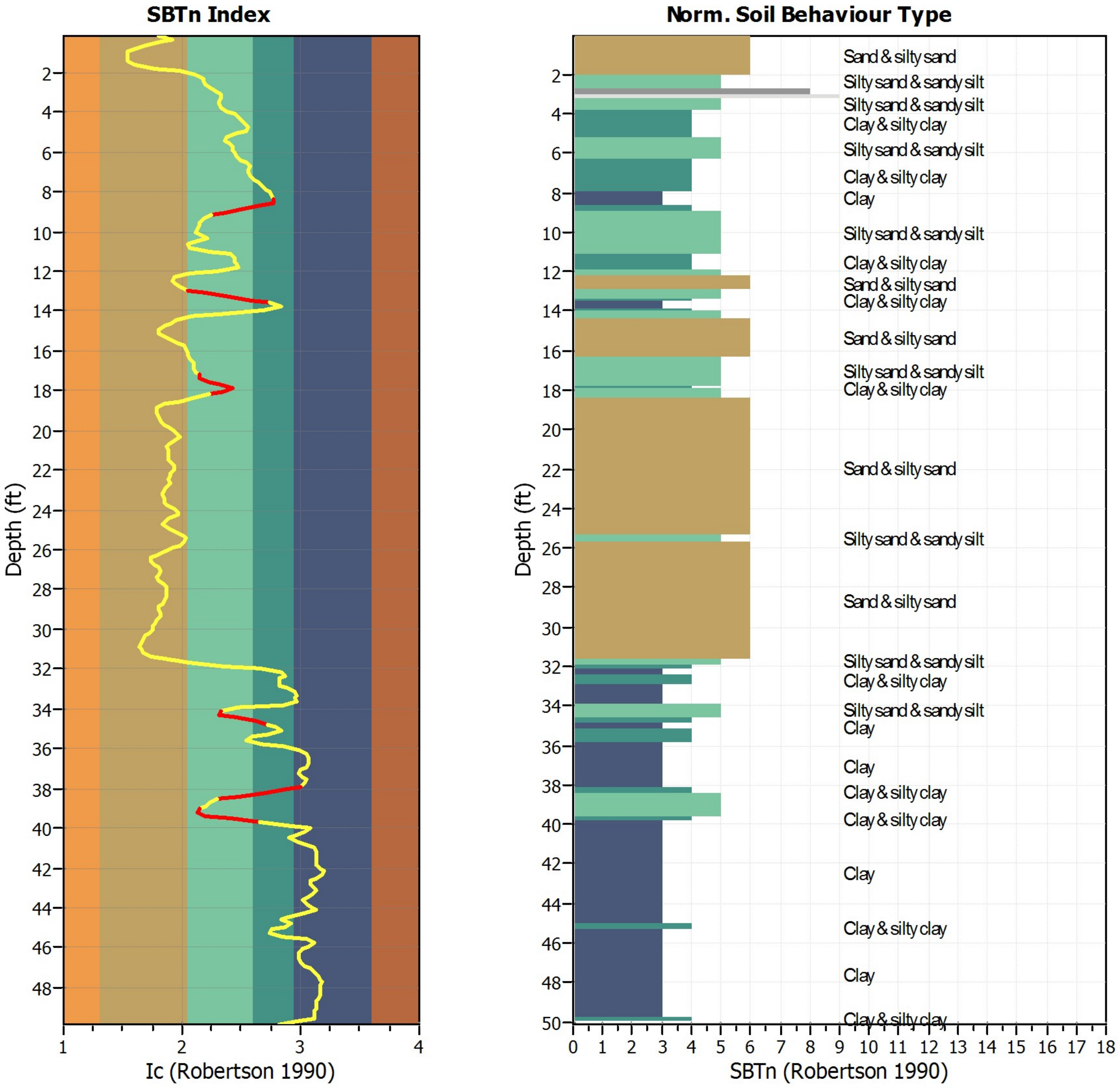
Analysis method: NCEER 1998
Fines correction method: Robertson & Wride
Points to test: Based on Ic value
Earthquake magnitude M_w: 7.10
Peak ground acceleration: 0.25
Depth to water table (insitu): 6.00 ft
Depth to water table (erthq.): 6.00 ft
Average results interval: 3
Ic cut-off value: 2.60
Unit weight calculation: Based on SBT
Use fill: No
Fill height: N/A
Fill weight: N/A
Transition detect. applied: Yes
K_σ applied: No
Clay like behavior applied: All soils
Limit depth applied: No
Limit depth: N/A

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties

I_c minimum check value:	2.10
I_c maximum check value:	2.92
I_c change ratio value:	0.0250
Minimum number of points in layer:	4

General statistics

Total points in CPT file:	305
Total points excluded:	34
Exclusion percentage:	11.15%
Number of layers detected:	7

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.97	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.92	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.87	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.82	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.77	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.72	0.16	0.00	1.97	2.00	0.00	9.70	0.16	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.62	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.44	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.37	0.16	0.00	4.27	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.32	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.27	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.09	2.00	0.00	9.22	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.17	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.12	0.16	0.00	5.91	2.00	0.00	9.10	0.16	0.00
6.07	1.51	0.00	9.07	0.16	0.00	6.23	1.49	0.00	9.05	0.16	0.00
6.40	1.50	0.00	9.02	0.16	0.00	6.56	2.00	0.00	9.00	0.16	0.00
6.73	2.00	0.00	8.97	0.16	0.00	6.89	2.00	0.00	8.95	0.16	0.00
7.05	2.00	0.00	8.92	0.16	0.00	7.22	2.00	0.00	8.90	0.16	0.00
7.38	2.00	0.00	8.87	0.16	0.00	7.55	2.00	0.00	8.85	0.16	0.00
7.71	2.00	0.00	8.82	0.16	0.00	7.87	2.00	0.00	8.80	0.16	0.00
8.04	2.00	0.00	8.77	0.16	0.00	8.20	2.00	0.00	8.75	0.16	0.00
8.37	2.00	0.00	8.72	0.16	0.00	8.53	2.00	0.00	8.70	0.16	0.00
8.69	2.00	0.00	8.67	0.16	0.00	8.86	2.00	0.00	8.65	0.16	0.00
9.02	2.00	0.00	8.62	0.16	0.00	9.19	2.00	0.00	8.60	0.16	0.00
9.35	2.00	0.00	8.57	0.16	0.00	9.51	0.63	0.37	8.55	0.16	0.16
9.68	0.61	0.39	8.52	0.16	0.16	9.84	0.64	0.36	8.50	0.16	0.15
10.01	0.77	0.23	8.47	0.16	0.10	10.17	1.11	0.00	8.45	0.16	0.00
10.33	1.73	0.00	8.42	0.16	0.00	10.50	2.00	0.00	8.40	0.16	0.00
10.66	2.00	0.00	8.37	0.16	0.00	10.83	2.00	0.00	8.35	0.16	0.00
10.99	2.00	0.00	8.32	0.16	0.00	11.15	2.00	0.00	8.30	0.16	0.00
11.32	2.00	0.00	8.27	0.16	0.00	11.48	2.00	0.00	8.25	0.16	0.00
11.65	2.00	0.00	8.22	0.16	0.00	11.81	1.98	0.00	8.20	0.16	0.00
11.98	1.65	0.00	8.17	0.16	0.00	12.14	1.51	0.00	8.15	0.16	0.00
12.30	1.81	0.00	8.12	0.16	0.00	12.47	2.00	0.00	8.10	0.16	0.00
12.63	2.00	0.00	8.07	0.16	0.00	12.80	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.02	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	2.00	0.00	7.97	0.16	0.00	13.45	2.00	0.00	7.95	0.16	0.00
13.62	2.00	0.00	7.92	0.16	0.00	13.78	2.00	0.00	7.90	0.16	0.00
13.94	2.00	0.00	7.87	0.16	0.00	14.11	1.04	0.00	7.85	0.16	0.00
14.27	0.97	0.03	7.82	0.16	0.01	14.44	1.16	0.00	7.80	0.16	0.00
14.60	1.44	0.00	7.77	0.16	0.00	14.76	1.62	0.00	7.75	0.16	0.00
14.93	1.56	0.00	7.72	0.16	0.00	15.09	1.35	0.00	7.70	0.16	0.00
15.26	1.22	0.00	7.67	0.16	0.00	15.42	1.13	0.00	7.65	0.16	0.00
15.58	1.03	0.00	7.62	0.16	0.00	15.75	0.92	0.08	7.60	0.16	0.03

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	0.83	0.17	7.57	0.16	0.07	16.08	0.77	0.23	7.55	0.16	0.09
16.24	0.74	0.26	7.52	0.16	0.10	16.40	0.73	0.27	7.50	0.16	0.10
16.57	0.71	0.29	7.47	0.16	0.11	16.73	0.69	0.31	7.45	0.16	0.11
16.90	0.68	0.32	7.42	0.16	0.12	17.06	0.71	0.29	7.40	0.16	0.11
17.22	0.78	0.22	7.37	0.16	0.08	17.39	2.00	0.00	7.35	0.16	0.00
17.55	2.00	0.00	7.32	0.16	0.00	17.72	2.00	0.00	7.30	0.16	0.00
17.88	2.00	0.00	7.27	0.16	0.00	18.04	2.00	0.00	7.25	0.16	0.00
18.21	2.00	0.00	7.22	0.16	0.00	18.37	2.00	0.00	7.20	0.16	0.00
18.54	1.84	0.00	7.17	0.16	0.00	18.70	1.50	0.00	7.15	0.16	0.00
18.86	1.48	0.00	7.12	0.16	0.00	19.03	1.55	0.00	7.10	0.16	0.00
19.19	1.49	0.00	7.07	0.16	0.00	19.36	1.40	0.00	7.05	0.16	0.00
19.52	1.35	0.00	7.02	0.16	0.00	19.69	1.38	0.00	7.00	0.16	0.00
19.85	1.39	0.00	6.97	0.16	0.00	20.01	1.33	0.00	6.95	0.16	0.00
20.18	1.23	0.00	6.92	0.16	0.00	20.34	1.12	0.00	6.90	0.16	0.00
20.51	1.07	0.00	6.87	0.16	0.00	20.67	1.09	0.00	6.85	0.16	0.00
20.83	1.15	0.00	6.82	0.16	0.00	21.00	1.17	0.00	6.80	0.16	0.00
21.16	1.11	0.00	6.77	0.16	0.00	21.33	1.07	0.00	6.75	0.16	0.00
21.49	1.07	0.00	6.72	0.16	0.00	21.65	1.14	0.00	6.70	0.16	0.00
21.82	1.23	0.00	6.67	0.16	0.00	21.98	1.29	0.00	6.65	0.16	0.00
22.15	1.35	0.00	6.62	0.16	0.00	22.31	1.40	0.00	6.60	0.16	0.00
22.47	1.49	0.00	6.57	0.16	0.00	22.64	1.56	0.00	6.55	0.16	0.00
22.80	1.56	0.00	6.52	0.16	0.00	22.97	1.51	0.00	6.50	0.16	0.00
23.13	1.47	0.00	6.47	0.16	0.00	23.29	1.44	0.00	6.45	0.16	0.00
23.46	1.36	0.00	6.42	0.16	0.00	23.62	1.22	0.00	6.40	0.16	0.00
23.79	1.10	0.00	6.37	0.16	0.00	23.95	1.02	0.00	6.35	0.16	0.00
24.11	0.94	0.06	6.32	0.16	0.02	24.28	0.92	0.08	6.30	0.16	0.02
24.44	0.93	0.07	6.27	0.16	0.02	24.61	1.08	0.00	6.25	0.16	0.00
24.77	1.24	0.00	6.22	0.16	0.00	24.93	1.37	0.00	6.20	0.16	0.00
25.10	1.49	0.00	6.17	0.16	0.00	25.26	1.65	0.00	6.15	0.16	0.00
25.43	1.79	0.00	6.12	0.16	0.00	25.59	1.81	0.00	6.10	0.16	0.00
25.75	1.77	0.00	6.07	0.16	0.00	25.92	1.85	0.00	6.05	0.16	0.00
26.08	1.97	0.00	6.02	0.16	0.00	26.25	2.00	0.00	6.00	0.16	0.00
26.41	2.00	0.00	5.97	0.16	0.00	26.57	2.00	0.00	5.95	0.16	0.00
26.74	2.00	0.00	5.92	0.16	0.00	26.90	2.00	0.00	5.90	0.16	0.00
27.07	2.00	0.00	5.87	0.16	0.00	27.23	1.91	0.00	5.85	0.16	0.00
27.40	1.71	0.00	5.82	0.16	0.00	27.56	1.48	0.00	5.80	0.16	0.00
27.72	1.33	0.00	5.77	0.16	0.00	27.89	1.19	0.00	5.75	0.16	0.00
28.05	1.11	0.00	5.72	0.16	0.00	28.22	1.11	0.00	5.70	0.16	0.00
28.38	1.15	0.00	5.67	0.16	0.00	28.54	1.23	0.00	5.65	0.16	0.00
28.71	1.38	0.00	5.62	0.16	0.00	28.87	1.58	0.00	5.60	0.16	0.00
29.04	1.78	0.00	5.57	0.16	0.00	29.20	1.89	0.00	5.55	0.16	0.00
29.36	1.93	0.00	5.52	0.16	0.00	29.53	2.00	0.00	5.50	0.16	0.00
29.69	2.00	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	2.00	0.00	5.27	0.16	0.00	31.17	2.00	0.00	5.25	0.16	0.00
31.33	2.00	0.00	5.22	0.16	0.00	31.50	2.00	0.00	5.20	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	2.00	0.00	5.17	0.16	0.00	31.82	1.48	0.00	5.15	0.16	0.00
31.99	2.00	0.00	5.12	0.16	0.00	32.15	2.00	0.00	5.10	0.16	0.00
32.32	2.00	0.00	5.07	0.16	0.00	32.48	2.00	0.00	5.05	0.16	0.00
32.64	2.00	0.00	5.02	0.16	0.00	32.81	2.00	0.00	5.00	0.16	0.00
32.97	2.00	0.00	4.97	0.16	0.00	33.14	2.00	0.00	4.95	0.16	0.00
33.30	2.00	0.00	4.92	0.16	0.00	33.46	2.00	0.00	4.90	0.16	0.00
33.63	2.00	0.00	4.87	0.16	0.00	33.79	2.00	0.00	4.85	0.16	0.00
33.96	0.65	0.35	4.82	0.16	0.08	34.12	0.81	0.19	4.80	0.16	0.05
34.28	2.00	0.00	4.77	0.16	0.00	34.45	2.00	0.00	4.75	0.16	0.00
34.61	2.00	0.00	4.72	0.16	0.00	34.78	2.00	0.00	4.70	0.16	0.00
34.94	2.00	0.00	4.67	0.16	0.00	35.10	2.00	0.00	4.65	0.16	0.00
35.27	2.00	0.00	4.62	0.16	0.00	35.43	1.22	0.00	4.60	0.16	0.00
35.60	0.90	0.10	4.57	0.16	0.02	35.76	2.00	0.00	4.55	0.16	0.00
35.93	2.00	0.00	4.52	0.16	0.00	36.09	2.00	0.00	4.50	0.16	0.00
36.25	2.00	0.00	4.47	0.16	0.00	36.42	2.00	0.00	4.45	0.16	0.00
36.58	2.00	0.00	4.42	0.16	0.00	36.75	2.00	0.00	4.40	0.16	0.00
36.91	2.00	0.00	4.37	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	2.00	0.00	4.30	0.16	0.00
37.57	2.00	0.00	4.27	0.16	0.00	37.73	2.00	0.00	4.25	0.16	0.00
37.89	2.00	0.00	4.22	0.16	0.00	38.06	2.00	0.00	4.20	0.16	0.00
38.22	2.00	0.00	4.17	0.16	0.00	38.39	2.00	0.00	4.15	0.16	0.00
38.55	2.00	0.00	4.12	0.16	0.00	38.71	2.00	0.00	4.10	0.16	0.00
38.88	0.68	0.32	4.07	0.16	0.07	39.04	0.65	0.35	4.05	0.16	0.07
39.21	2.00	0.00	4.02	0.16	0.00	39.37	2.00	0.00	4.00	0.16	0.00
39.53	2.00	0.00	3.97	0.16	0.00	39.70	2.00	0.00	3.95	0.16	0.00
39.86	2.00	0.00	3.92	0.16	0.00	40.03	2.00	0.00	3.90	0.16	0.00
40.19	2.00	0.00	3.87	0.16	0.00	40.35	2.00	0.00	3.85	0.16	0.00
40.52	2.00	0.00	3.82	0.16	0.00	40.68	2.00	0.00	3.80	0.16	0.00
40.85	1.98	0.00	3.77	0.16	0.00	41.01	1.69	0.00	3.75	0.16	0.00
41.17	1.58	0.00	3.72	0.16	0.00	41.34	1.52	0.00	3.70	0.16	0.00
41.50	1.51	0.00	3.67	0.16	0.00	41.67	1.51	0.00	3.65	0.16	0.00
41.83	1.53	0.00	3.62	0.16	0.00	41.99	1.53	0.00	3.60	0.16	0.00
42.16	1.47	0.00	3.57	0.16	0.00	42.32	1.47	0.00	3.55	0.16	0.00
42.49	1.49	0.00	3.52	0.16	0.00	42.65	1.55	0.00	3.50	0.16	0.00
42.81	1.53	0.00	3.47	0.16	0.00	42.98	1.53	0.00	3.45	0.16	0.00
43.14	1.53	0.00	3.42	0.16	0.00	43.31	1.70	0.00	3.40	0.16	0.00
43.47	1.97	0.00	3.37	0.16	0.00	43.64	2.00	0.00	3.35	0.16	0.00
43.80	2.00	0.00	3.32	0.16	0.00	43.96	2.00	0.00	3.30	0.16	0.00
44.13	2.00	0.00	3.27	0.16	0.00	44.29	2.00	0.00	3.25	0.16	0.00
44.46	2.00	0.00	3.22	0.16	0.00	44.62	2.00	0.00	3.20	0.16	0.00
44.78	2.00	0.00	3.17	0.16	0.00	44.95	2.00	0.00	3.15	0.16	0.00
45.11	2.00	0.00	3.12	0.16	0.00	45.28	2.00	0.00	3.10	0.16	0.00
45.44	2.00	0.00	3.07	0.16	0.00	45.60	2.00	0.00	3.05	0.16	0.00
45.77	2.00	0.00	3.02	0.16	0.00	45.93	2.00	0.00	3.00	0.16	0.00
46.10	2.00	0.00	2.97	0.16	0.00	46.26	2.00	0.00	2.95	0.16	0.00
46.42	2.00	0.00	2.92	0.16	0.00	46.59	2.00	0.00	2.90	0.16	0.00
46.75	2.00	0.00	2.87	0.16	0.00	46.92	2.00	0.00	2.85	0.16	0.00
47.08	2.00	0.00	2.82	0.16	0.00	47.24	2.00	0.00	2.80	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
47.41	2.00	0.00	2.77	0.16	0.00	47.57	2.00	0.00	2.75	0.16	0.00
47.74	2.00	0.00	2.72	0.16	0.00	47.90	2.00	0.00	2.70	0.16	0.00
48.06	2.00	0.00	2.67	0.16	0.00	48.23	2.00	0.00	2.65	0.16	0.00
48.39	2.00	0.00	2.62	0.16	0.00	48.56	2.00	0.00	2.60	0.16	0.00
48.72	2.00	0.00	2.57	0.16	0.00	48.88	2.00	0.00	2.55	0.16	0.00
49.05	2.00	0.00	2.52	0.16	0.00	49.21	2.00	0.00	2.50	0.16	0.00
49.38	2.00	0.00	2.47	0.16	0.00	49.54	2.00	0.00	2.45	0.16	0.00
49.70	2.00	0.00	2.42	0.16	0.00	49.87	2.00	0.00	2.40	0.16	0.00
50.03	0.29	0.71	2.37	0.16	0.08						

Overall liquefaction potential: 1.94

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS:	Calculated factor of safety for test point
F_L:	1 - FS
w_z:	Function value of the extend of soil liquefaction according to depth
d_z:	Layer thickness (ft)
LPI:	Liquefaction potential index value for test point

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Kc	Qc1n	Qc1n,cs	N1,60 (blows)	Vs (ft/s)	Gmax (tsf)	CSR	Shear, γ (%)	Svol,15 (%)	Nc	ev (%)	Settle. (in)
0.16	1.80	1.00	69.02	69.02	13	151.8	31	0.14	0.026	0.04	11.65	0.04	0.001
0.33	1.92	1.21	74.60	89.90	18	193.0	54	0.14	0.014	0.02	11.65	0.01	0.001
0.49	1.82	1.00	78.01	78.01	15	224.0	74	0.14	0.012	0.02	11.65	0.01	0.001
0.66	1.68	1.00	95.57	95.57	18	267.2	108	0.14	0.007	0.01	11.65	0.01	0.000
0.82	1.59	1.00	112.07	112.07	20	311.2	151	0.14	0.005	0.01	11.65	0.00	0.000
0.98	1.55	1.00	118.78	118.78	21	333.3	175	0.14	0.005	0.01	11.65	0.00	0.000
1.15	1.54	1.00	114.03	114.03	20	337.7	179	0.14	0.006	0.01	11.65	0.01	0.000
1.31	1.55	1.00	107.07	107.07	19	337.0	177	0.14	0.008	0.01	11.65	0.01	0.000
1.48	1.54	1.00	106.77	106.77	19	342.5	183	0.14	0.009	0.01	11.65	0.01	0.000
1.64	1.61	1.00	110.74	110.74	20	361.5	211	0.14	0.008	0.01	11.65	0.01	0.000
1.80	1.78	1.09	115.96	126.31	24	391.5	260	0.14	0.006	0.01	11.65	0.00	0.000
1.97	1.98	1.27	118.57	150.83	31	418.9	309	0.14	0.006	0.00	11.65	0.00	0.000
2.13	2.12	1.49	117.14	174.84	38	440.9	349	0.14	0.005	0.00	11.65	0.00	0.000
2.30	2.17	1.60	118.49	189.92	42	461.3	387	0.14	0.005	0.00	11.65	0.00	0.000
2.46	2.18	1.61	124.52	200.92	45	486.3	435	0.14	0.005	0.00	11.65	0.00	0.000
2.62	2.20	1.66	127.53	212.31	48	507.4	478	0.14	0.005	0.00	11.65	0.00	0.000
2.79	2.25	1.79	124.02	221.73	51	518.6	503	0.14	0.005	0.00	11.65	0.00	0.000
2.95	2.30	1.95	113.78	221.50	52	515.5	496	0.14	0.005	0.00	11.65	0.00	0.000
3.12	2.33	2.03	105.61	214.60	51	511.4	487	0.14	0.006	0.00	11.65	0.00	0.000
3.28	2.33	2.04	100.18	204.32	49	508.9	481	0.14	0.006	0.00	11.65	0.00	0.000
3.44	2.31	1.99	96.73	192.66	46	507.8	477	0.14	0.007	0.00	11.65	0.00	0.000
3.61	2.31	1.98	94.63	187.59	44	512.1	485	0.14	0.007	0.00	11.65	0.00	0.000
3.77	2.33	2.05	89.04	182.50	44	508.7	477	0.14	0.007	0.00	11.65	0.00	0.000
3.94	2.38	2.25	81.17	182.67	45	502.8	465	0.14	0.008	0.00	11.65	0.00	0.000
4.10	2.44	2.47	70.47	174.30	44	484.8	429	0.14	0.009	0.00	11.65	0.00	0.000
4.27	2.48	2.67	63.48	169.61	43	474.5	408	0.14	0.010	0.00	11.65	0.00	0.000
4.43	2.50	2.79	59.70	166.68	43	471.4	402	0.14	0.011	0.00	11.65	0.00	0.000
4.59	2.53	2.92	56.42	165.02	43	469.6	398	0.14	0.012	0.00	11.65	0.00	0.000
4.76	2.56	3.07	51.98	159.53	42	461.9	383	0.14	0.013	0.01	11.65	0.00	0.000
4.92	2.55	3.01	49.15	148.08	39	453.9	368	0.14	0.015	0.01	11.65	0.01	0.000
5.09	2.46	2.56	53.72	137.43	35	465.0	386	0.14	0.014	0.01	11.65	0.01	0.000
5.25	2.38	2.24	59.76	133.70	33	482.6	418	0.14	0.013	0.01	11.65	0.01	0.000
5.41	2.36	2.15	61.15	131.78	32	489.9	432	0.14	0.013	0.01	11.65	0.01	0.000
5.58	2.40	2.30	55.63	127.68	31	479.5	411	0.14	0.014	0.01	11.65	0.01	0.000
5.74	2.43	2.43	49.67	120.66	30	464.2	382	0.14	0.017	0.01	11.65	0.01	0.000
5.91	2.43	2.44	46.90	114.67	29	456.7	367	0.14	0.019	0.01	11.65	0.01	0.000

Total estimated settlement: 0.01

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
6.07	112.36	1.51	0.00	0.00	6.23	112.27	1.49	0.00	0.00
6.40	113.68	1.50	0.00	0.00	6.56	143.78	2.00	0.00	0.00
6.73	174.72	2.00	0.00	0.00	6.89	172.86	2.00	0.00	0.00
7.05	162.88	2.00	0.00	0.00	7.22	176.99	2.00	0.00	0.00
7.38	209.64	2.00	0.00	0.00	7.55	260.26	2.00	0.00	0.00
7.71	302.65	2.00	0.00	0.00	7.87	136.06	2.00	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
8.04	134.69	2.00	0.00	0.00	8.20	129.67	2.00	0.00	0.00
8.37	124.89	2.00	0.00	0.00	8.53	119.08	2.00	0.00	0.00
8.69	243.21	2.00	0.00	0.00	8.86	108.68	2.00	0.00	0.00
9.02	93.90	2.00	0.00	0.00	9.19	84.28	2.00	0.00	0.00
9.35	74.02	2.00	0.00	0.00	9.51	67.87	0.63	3.21	0.06
9.68	66.93	0.61	3.25	0.06	9.84	70.94	0.64	3.10	0.06
10.01	84.72	0.77	2.59	0.05	10.17	108.45	1.11	0.52	0.01
10.33	135.79	1.73	0.00	0.00	10.50	158.33	2.00	0.00	0.00
10.66	174.43	2.00	0.00	0.00	10.83	178.22	2.00	0.00	0.00
10.99	171.25	2.00	0.00	0.00	11.15	169.77	2.00	0.00	0.00
11.32	161.52	2.00	0.00	0.00	11.48	156.23	2.00	0.00	0.00
11.65	151.53	2.00	0.00	0.00	11.81	146.91	1.98	0.00	0.00
11.98	135.76	1.65	0.00	0.00	12.14	130.78	1.51	0.00	0.00
12.30	141.97	1.81	0.00	0.00	12.47	152.07	2.00	0.00	0.00
12.63	159.26	2.00	0.00	0.00	12.80	155.61	2.00	0.00	0.00
12.96	149.27	2.00	0.00	0.00	13.12	148.19	2.00	0.00	0.00
13.29	156.27	2.00	0.00	0.00	13.45	228.77	2.00	0.00	0.00
13.62	152.59	2.00	0.00	0.00	13.78	143.46	2.00	0.00	0.00
13.94	315.24	2.00	0.00	0.00	14.11	111.14	1.04	0.80	0.02
14.27	107.00	0.97	0.83	0.02	14.44	117.98	1.16	0.36	0.01
14.60	131.36	1.44	0.00	0.00	14.76	138.55	1.62	0.00	0.00
14.93	136.61	1.56	0.00	0.00	15.09	127.94	1.35	0.00	0.00
15.26	122.10	1.22	0.35	0.01	15.42	117.30	1.13	0.50	0.01
15.58	112.35	1.03	0.79	0.02	15.75	105.52	0.92	1.45	0.03
15.91	99.07	0.83	2.06	0.04	16.08	94.40	0.77	2.21	0.04
16.24	92.31	0.74	2.50	0.05	16.40	91.69	0.73	2.51	0.05
16.57	90.53	0.71	2.54	0.05	16.73	88.56	0.69	2.58	0.05
16.90	87.81	0.68	2.60	0.05	17.06	90.22	0.71	2.54	0.05
17.22	97.05	0.78	2.12	0.04	17.39	114.50	2.00	0.00	0.00
17.55	138.26	2.00	0.00	0.00	17.72	164.91	2.00	0.00	0.00
17.88	186.44	2.00	0.00	0.00	18.04	189.06	2.00	0.00	0.00
18.21	183.32	2.00	0.00	0.00	18.37	168.16	2.00	0.00	0.00
18.54	149.99	1.84	0.00	0.00	18.70	137.52	1.50	0.00	0.00
18.86	136.71	1.48	0.00	0.00	19.03	139.46	1.55	0.00	0.00
19.19	137.10	1.49	0.00	0.00	19.36	133.65	1.40	0.00	0.00
19.52	131.46	1.35	0.00	0.00	19.69	132.81	1.38	0.00	0.00
19.85	133.21	1.39	0.00	0.00	20.01	130.66	1.33	0.24	0.00
20.18	126.05	1.23	0.34	0.01	20.34	120.60	1.12	0.49	0.01
20.51	118.01	1.07	0.50	0.01	20.67	119.37	1.09	0.49	0.01
20.83	122.26	1.15	0.48	0.01	21.00	123.35	1.17	0.35	0.01
21.16	120.65	1.11	0.49	0.01	21.33	118.65	1.07	0.49	0.01
21.49	118.63	1.07	0.49	0.01	21.65	122.16	1.14	0.48	0.01
21.82	126.73	1.23	0.34	0.01	21.98	129.82	1.29	0.24	0.00
22.15	132.61	1.35	0.24	0.00	22.31	134.87	1.40	0.00	0.00
22.47	138.76	1.49	0.00	0.00	22.64	141.66	1.56	0.00	0.00
22.80	141.64	1.56	0.00	0.00	22.97	139.89	1.51	0.00	0.00
23.13	138.10	1.47	0.00	0.00	23.29	137.03	1.44	0.00	0.00
23.46	133.55	1.36	0.00	0.00	23.62	127.28	1.22	0.34	0.01

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
23.79	120.77	1.10	0.49	0.01
24.11	111.79	0.94	1.33	0.03
24.44	111.21	0.93	1.34	0.03
24.77	128.23	1.24	0.34	0.01
25.10	139.57	1.49	0.00	0.00
25.43	151.11	1.79	0.00	0.00
25.75	150.48	1.77	0.00	0.00
26.08	157.08	1.97	0.00	0.00
26.41	160.87	2.00	0.00	0.00
26.74	162.92	2.00	0.00	0.00
27.07	161.67	2.00	0.00	0.00
27.40	148.31	1.71	0.00	0.00
27.72	132.89	1.33	0.24	0.00
28.05	122.33	1.11	0.48	0.01
28.38	124.50	1.15	0.35	0.01
28.71	135.30	1.38	0.00	0.00
29.04	151.04	1.78	0.00	0.00
29.36	156.05	1.93	0.00	0.00
29.69	163.07	2.00	0.00	0.00
30.02	175.07	2.00	0.00	0.00
30.35	184.55	2.00	0.00	0.00
30.68	207.82	2.00	0.00	0.00
31.00	234.96	2.00	0.00	0.00
31.33	216.75	2.00	0.00	0.00
31.66	159.52	2.00	0.00	0.00
31.99	253.08	2.00	0.00	0.00
32.32	83.73	2.00	0.00	0.00
32.64	71.61	2.00	0.00	0.00
32.97	67.44	2.00	0.00	0.00
33.30	65.57	2.00	0.00	0.00
33.63	68.08	2.00	0.00	0.00
33.96	88.98	0.65	2.57	0.05
34.28	111.78	2.00	0.00	0.00
34.61	203.05	2.00	0.00	0.00
34.94	101.38	2.00	0.00	0.00
35.27	88.58	2.00	0.00	0.00
35.60	109.12	0.90	1.38	0.03
35.93	93.76	2.00	0.00	0.00
36.25	81.67	2.00	0.00	0.00
36.58	74.40	2.00	0.00	0.00
36.91	74.67	2.00	0.00	0.00
37.24	77.51	2.00	0.00	0.00
37.57	81.91	2.00	0.00	0.00
37.89	93.60	2.00	0.00	0.00
38.22	109.03	2.00	0.00	0.00
38.55	92.58	2.00	0.00	0.00
38.88	90.26	0.68	2.54	0.05
39.21	81.86	2.00	0.00	0.00

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
23.95	116.67	1.02	0.77	0.02
24.28	110.38	0.92	1.35	0.03
24.61	119.77	1.08	0.49	0.01
24.93	134.60	1.37	0.00	0.00
25.26	145.83	1.65	0.00	0.00
25.59	151.88	1.81	0.00	0.00
25.92	153.13	1.85	0.00	0.00
26.25	160.19	2.00	0.00	0.00
26.57	161.72	2.00	0.00	0.00
26.90	162.71	2.00	0.00	0.00
27.23	155.41	1.91	0.00	0.00
27.56	139.59	1.48	0.00	0.00
27.89	126.23	1.19	0.34	0.01
28.22	121.87	1.11	0.48	0.01
28.54	128.54	1.23	0.34	0.01
28.87	143.47	1.58	0.00	0.00
29.20	154.72	1.89	0.00	0.00
29.53	158.50	2.00	0.00	0.00
29.86	168.56	2.00	0.00	0.00
30.18	180.46	2.00	0.00	0.00
30.51	191.61	2.00	0.00	0.00
30.84	225.39	2.00	0.00	0.00
31.17	231.61	2.00	0.00	0.00
31.50	190.45	2.00	0.00	0.00
31.82	139.44	1.48	0.00	0.00
32.15	101.45	2.00	0.00	0.00
32.48	74.30	2.00	0.00	0.00
32.81	67.19	2.00	0.00	0.00
33.14	67.01	2.00	0.00	0.00
33.46	64.92	2.00	0.00	0.00
33.79	78.85	2.00	0.00	0.00
34.12	102.61	0.81	1.96	0.04
34.45	114.55	2.00	0.00	0.00
34.78	106.36	2.00	0.00	0.00
35.10	95.53	2.00	0.00	0.00
35.43	127.24	1.22	0.34	0.01
35.76	200.28	2.00	0.00	0.00
36.09	89.18	2.00	0.00	0.00
36.42	76.67	2.00	0.00	0.00
36.75	74.08	2.00	0.00	0.00
37.07	75.49	2.00	0.00	0.00
37.40	79.68	2.00	0.00	0.00
37.73	85.30	2.00	0.00	0.00
38.06	105.32	2.00	0.00	0.00
38.39	102.40	2.00	0.00	0.00
38.71	90.19	2.00	0.00	0.00
39.04	87.76	0.65	2.60	0.05
39.37	78.40	2.00	0.00	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	Settlement (in)
39.53	81.43	2.00	0.00	0.00	39.70	173.81	2.00	0.00	0.00
39.86	82.01	2.00	0.00	0.00	40.03	76.81	2.00	0.00	0.00
40.19	75.63	2.00	0.00	0.00	40.35	77.44	2.00	0.00	0.00
40.52	76.57	2.00	0.00	0.00	40.68	73.07	2.00	0.00	0.00
40.85	67.25	1.98	0.00	0.00	41.01	61.73	1.69	0.02	0.00
41.17	59.01	1.58	0.03	0.00	41.34	57.07	1.52	0.04	0.00
41.50	56.48	1.51	0.04	0.00	41.67	56.66	1.51	0.05	0.00
41.83	58.16	1.53	0.04	0.00	41.99	60.00	1.53	0.04	0.00
42.16	60.66	1.47	0.05	0.00	42.32	59.67	1.47	0.05	0.00
42.49	56.31	1.49	0.05	0.00	42.65	53.47	1.55	0.04	0.00
42.81	52.84	1.53	0.04	0.00	42.98	55.20	1.53	0.04	0.00
43.14	57.42	1.53	0.04	0.00	43.31	60.12	1.70	0.02	0.00
43.47	63.84	1.97	0.00	0.00	43.64	68.26	2.00	0.00	0.00
43.80	71.44	2.00	0.00	0.00	43.96	73.14	2.00	0.00	0.00
44.13	76.88	2.00	0.00	0.00	44.29	80.46	2.00	0.00	0.00
44.46	84.17	2.00	0.00	0.00	44.62	83.87	2.00	0.00	0.00
44.78	84.61	2.00	0.00	0.00	44.95	86.16	2.00	0.00	0.00
45.11	94.22	2.00	0.00	0.00	45.28	101.58	2.00	0.00	0.00
45.44	103.70	2.00	0.00	0.00	45.60	96.70	2.00	0.00	0.00
45.77	87.64	2.00	0.00	0.00	45.93	81.15	2.00	0.00	0.00
46.10	76.62	2.00	0.00	0.00	46.26	73.22	2.00	0.00	0.00
46.42	74.06	2.00	0.00	0.00	46.59	79.66	2.00	0.00	0.00
46.75	86.27	2.00	0.00	0.00	46.92	89.08	2.00	0.00	0.00
47.08	87.92	2.00	0.00	0.00	47.24	85.29	2.00	0.00	0.00
47.41	84.64	2.00	0.00	0.00	47.57	85.36	2.00	0.00	0.00
47.74	85.62	2.00	0.00	0.00	47.90	83.98	2.00	0.00	0.00
48.06	81.36	2.00	0.00	0.00	48.23	78.69	2.00	0.00	0.00
48.39	76.56	2.00	0.00	0.00	48.56	76.04	2.00	0.00	0.00
48.72	76.39	2.00	0.00	0.00	48.88	77.20	2.00	0.00	0.00
49.05	76.96	2.00	0.00	0.00	49.21	77.09	2.00	0.00	0.00
49.38	78.22	2.00	0.00	0.00	49.54	80.90	2.00	0.00	0.00
49.70	69.56	2.00	0.00	0.00	49.87	53.55	2.00	0.00	0.00
50.03	9.74	0.29	5.80	0.11					

Total estimated settlement: 1.41

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
Settlement:	Calculated settlement

APPENDIX D

TRAFFIC STUDY

Project No: 257-58

TRAFFIC STUDY

PROPOSED EXPANSION
LEMOORE COMMUNITY COLLEGE CAMPUS
LEMOORE, CALIFORNIA

Prepared for:
QK, Inc.

December 2020

Prepared by:

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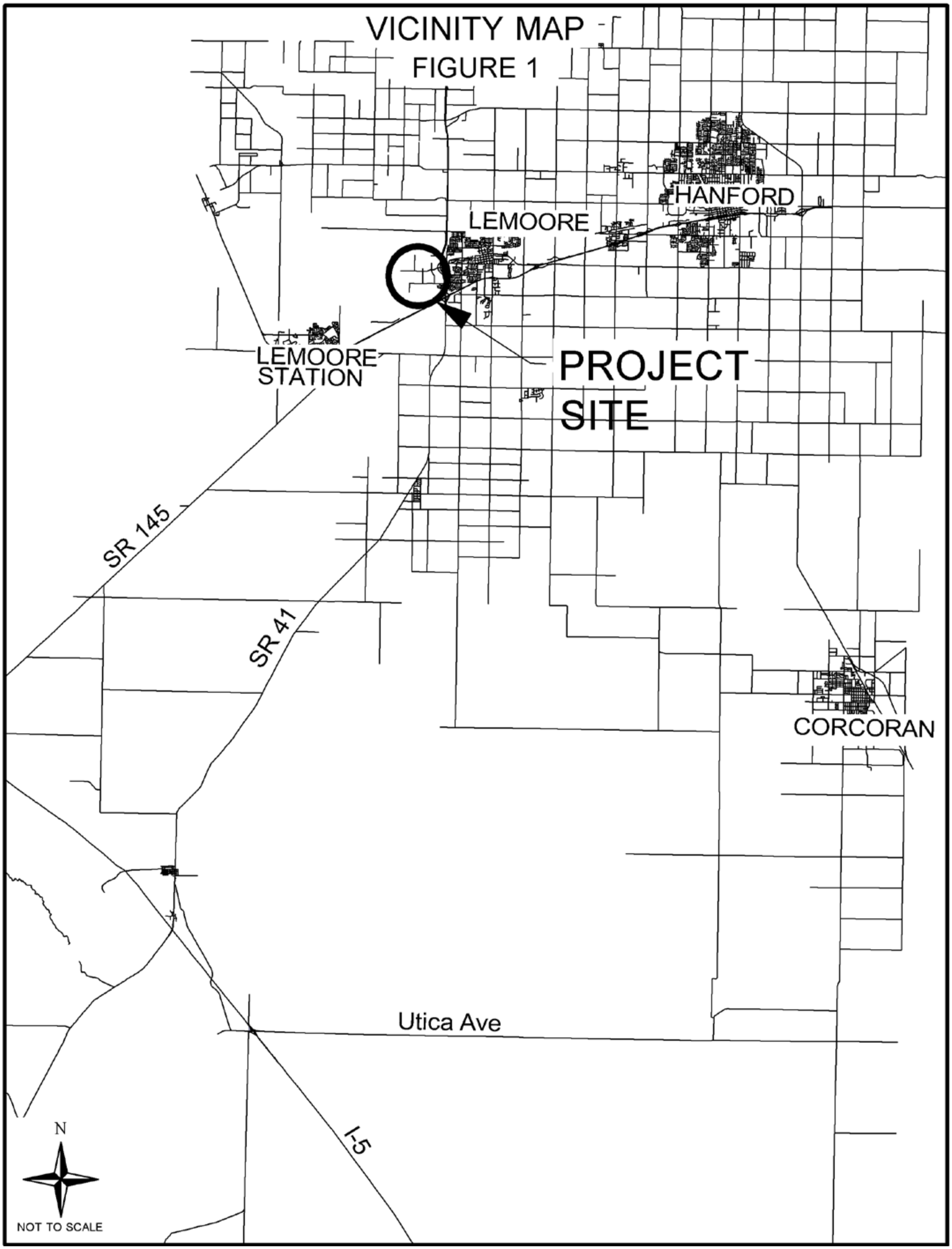
INTRODUCTION

The purpose of this study is to evaluate the potential traffic impacts of a proposed expansion of the Lemoore Community College campus located south of Bush Street and west of College Avenue in Lemoore, California. A vicinity map is presented in Figure 1 and a location map is presented in Figure 2.

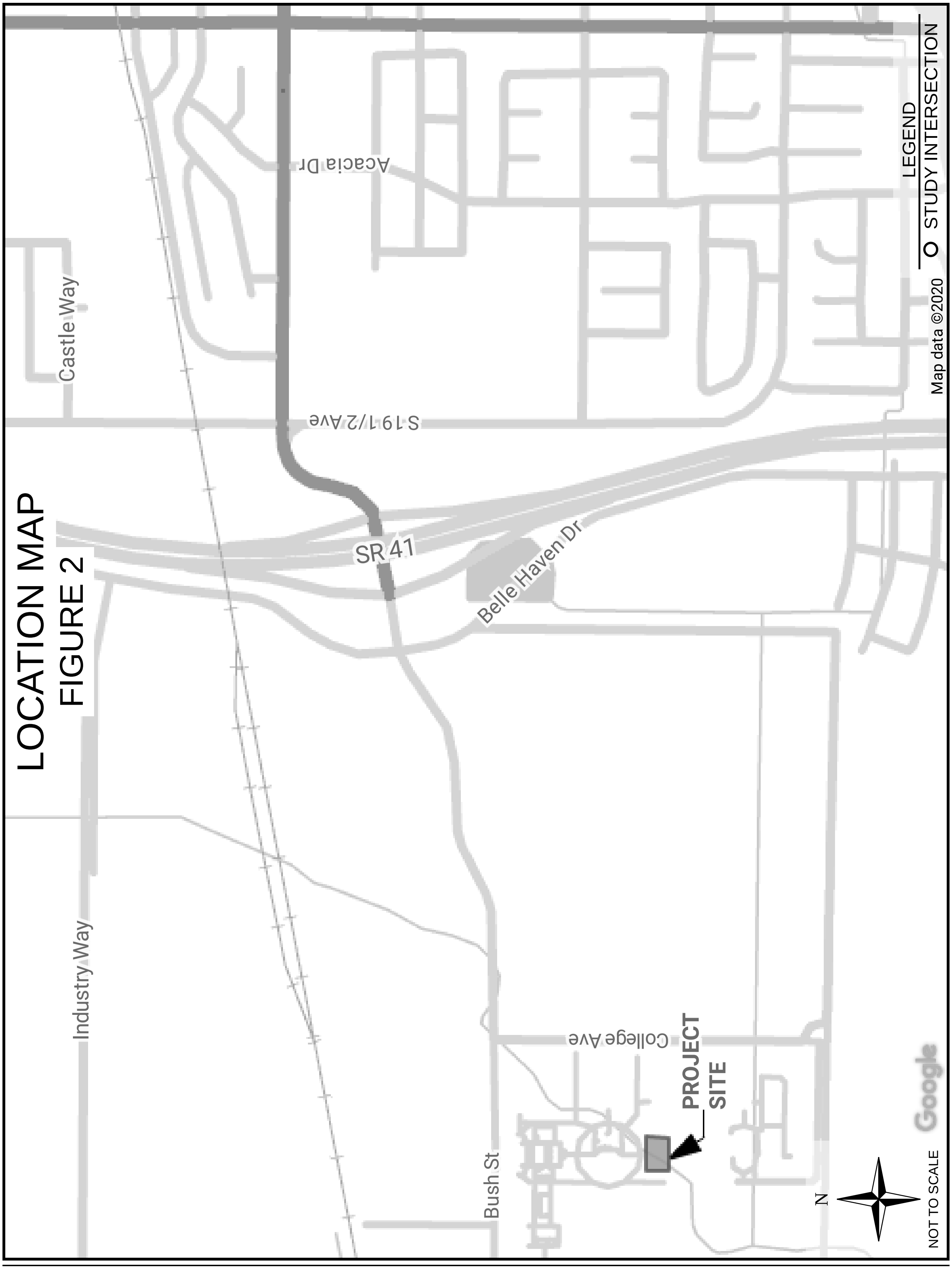
A. Project Description

The project is an expansion to the West Hills Community College in Lemoore, CA. The District is proposing to construct a 42,000 square foot, two-story Instructional Center (IC) on an undeveloped portion of the existing campus. The college has a current enrollment of 4,641 students and the proposed expansion is anticipated to increase the overall student population by approximately five percent, or 232 students. The IC will be used to expand education opportunities in the areas of allied health services, computer science, and graphic arts. A site plan is presented in Figure 3.


VICINITY MAP
FIGURE 1
HANFORD
LEMOORE
LEMOORE STATION
PROJECT SITE
SR 145
SR 41
CORCORAN
Utica Ave
I-5
N
NOT TO SCALE

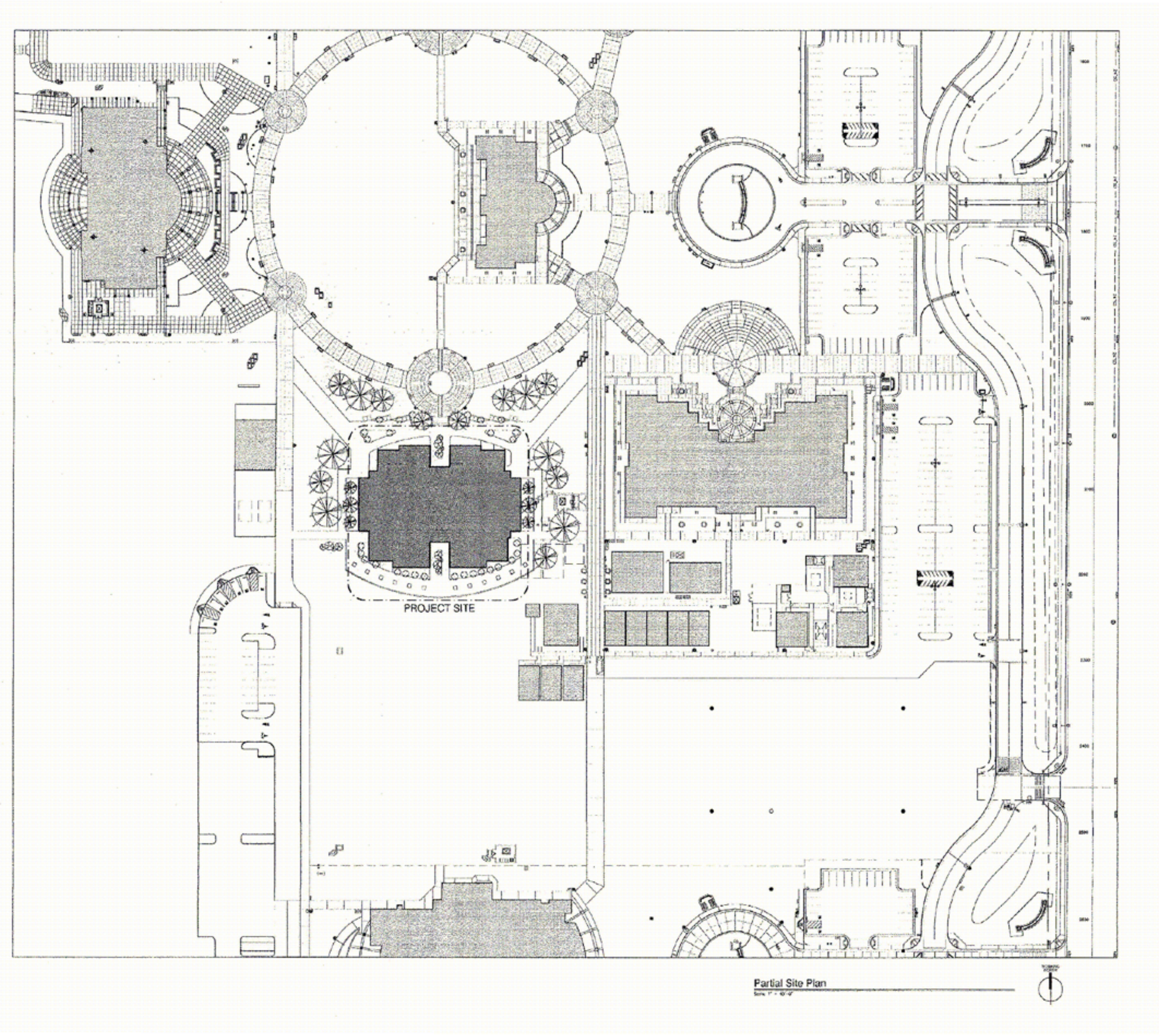
LOCATION MAP

FIGURE 2



SITE PLAN

FIGURE 3



B. Roadway Descriptions

19 ½ Avenue is a north-south collector that extends from Cinnamon Drive to Silverado Drive. In the vicinity of the project, it exists as a two-lane roadway and provides access to residential land uses.

Belle Haven Drive is an east-west collector that runs parallel to State Route 41 and extends south from W Hanford Armona Road. In the vicinity of the project, it exists as a two-lane roadway with curb and gutter.

Bush Street is an east-west arterial that extends from Marsh Drive to E D Street. It operates as a two-lane roadway and provides access to State Route 41 as well as many commercial, educational, religious, and residential land uses.

College Avenue is a north-south arterial that extends south from Bush Street. It operates as a two-lane roadway with partial curb and gutter and provides access to West Hills College Lemoore.

State Route 41 is a north-south state highway that extends from north from State Route 46. In the vicinity of the project, it operates as a four-lane highway.

PROJECT TRIP GENERATION AND DESIGN HOUR VOLUMES

The project trip generation and design hour volumes shown in Table 1 were estimated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Rates and directional splits for ITE Land Use Code 540 (Junior/Community College: Students, Weekday, Peak Hour of Adjacent Street Traffic) were used to estimate project trip generation based on a total of 232 students. The AM and PM peak hours of adjacent street traffic were determined to be between 7:00 AM and 8:00 AM, and between 4:30 PM and 5:30 PM, based on a review of historical count data.

Table 1
Project Trip Generation

General Information			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE Code	Development Type	Variable	ADT RATE	ADT	Rate	In % Split/ Trips	Out % Split/ Trips	Rate	In % Split/ Trips	Out % Split/ Trips
540	Junior/Community College	232 Students	eq	1012	eq	81% 92	19% 22	eq	56% 51	44% 40

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of project peak hour trips is shown in Table 2 and represents the movement of traffic accessing the project site by direction. The project trip distribution was developed based on site location and travel patterns anticipated for the proposed land use.

Table 2
Project Trip Distribution

Direction	Percent
North	5
East	5
South	5
West	85

Project peak hour trips were assigned to the study intersections as shown in Figure 4. Project trip assignment was developed based on trip generation, trip distribution and likely travel routes for traffic accessing the project site.

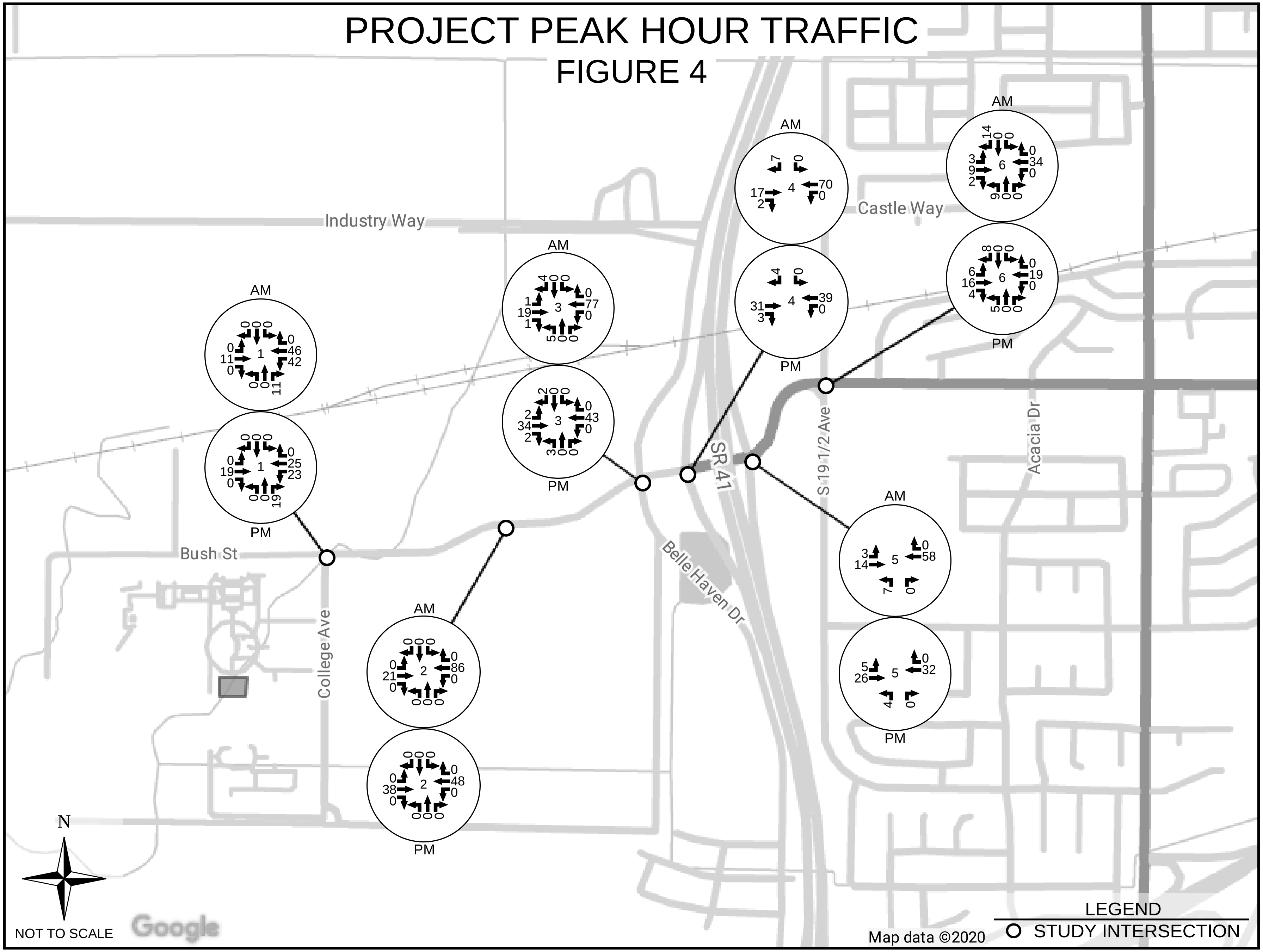
EXISTING AND FUTURE TRAFFIC

Due to the reduction in traffic due to the COVID-19 pandemic, the peak hour turning movement counts used were obtained from the Lennar Lemoore Traffic Impact Study prepared by ND Engineering, PC, in August 2019 and are attached in the appendix. Growth rates were applied to grow out the 2018 peak hour turning movement counts to reflect traffic volumes in 2020.

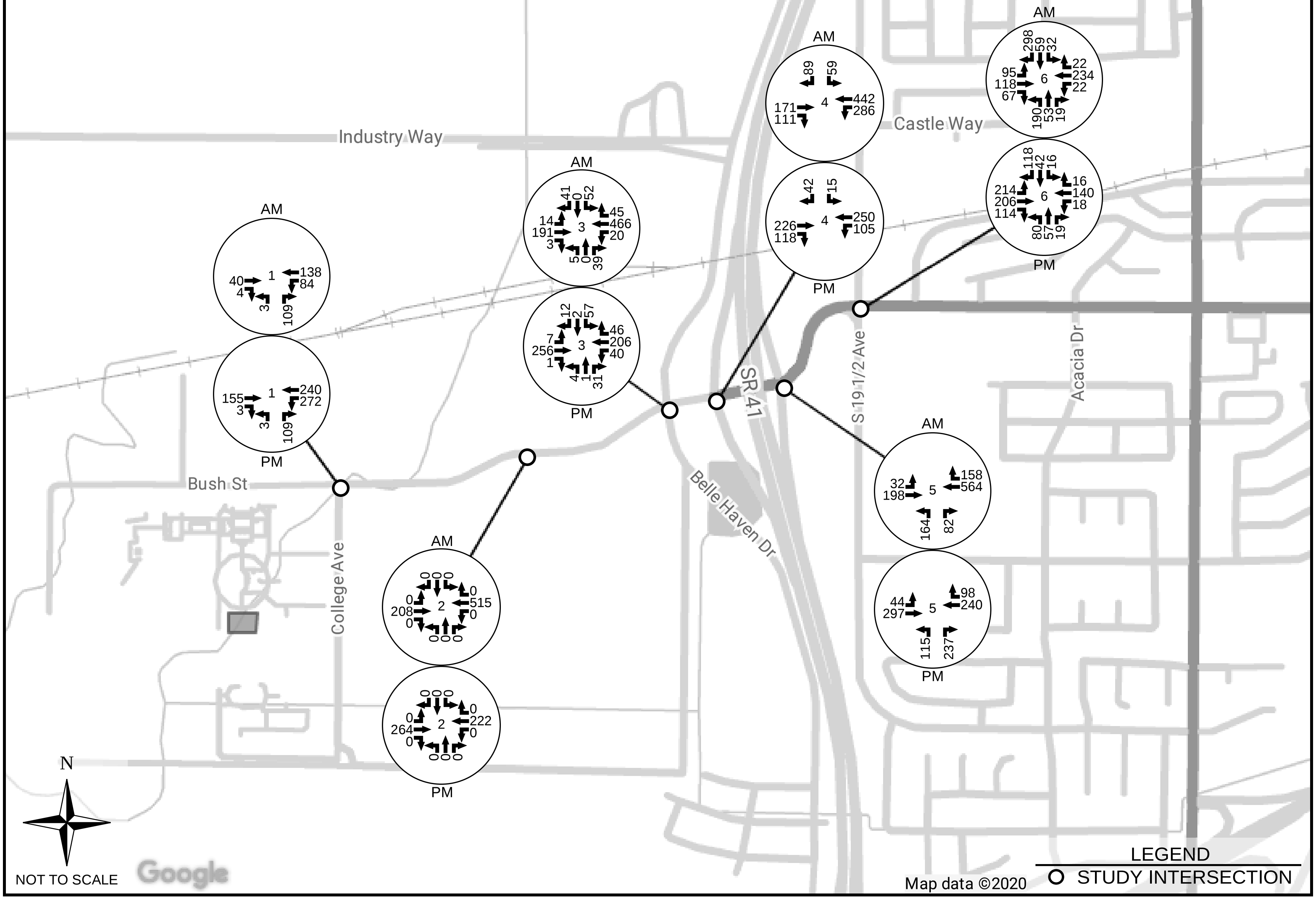
Average annual growth rates ranging between 1% and 6.9% were applied to counts at the study intersections in order to estimate projected 2040 peak hour volumes. For intersections showing negative or zero growth, 1% per year growth was applied to estimate future peak hour turning movements. These growth rates were developed based on a review of the regional travel demand model data from the Kings County Association of Governments (KCAG)

Existing peak hour volumes are shown in Figure 5, and existing plus project peak hour volumes are shown in Figure 6. Peak hour volumes for the year 2024 (assumed build out year), both without and with project traffic, are shown in Figures 7 and 8, respectively. The same for the year 2040 is shown in Figures 9 and 10, respectively.

PROJECT PEAK HOUR TRAFFIC
FIGURE 4

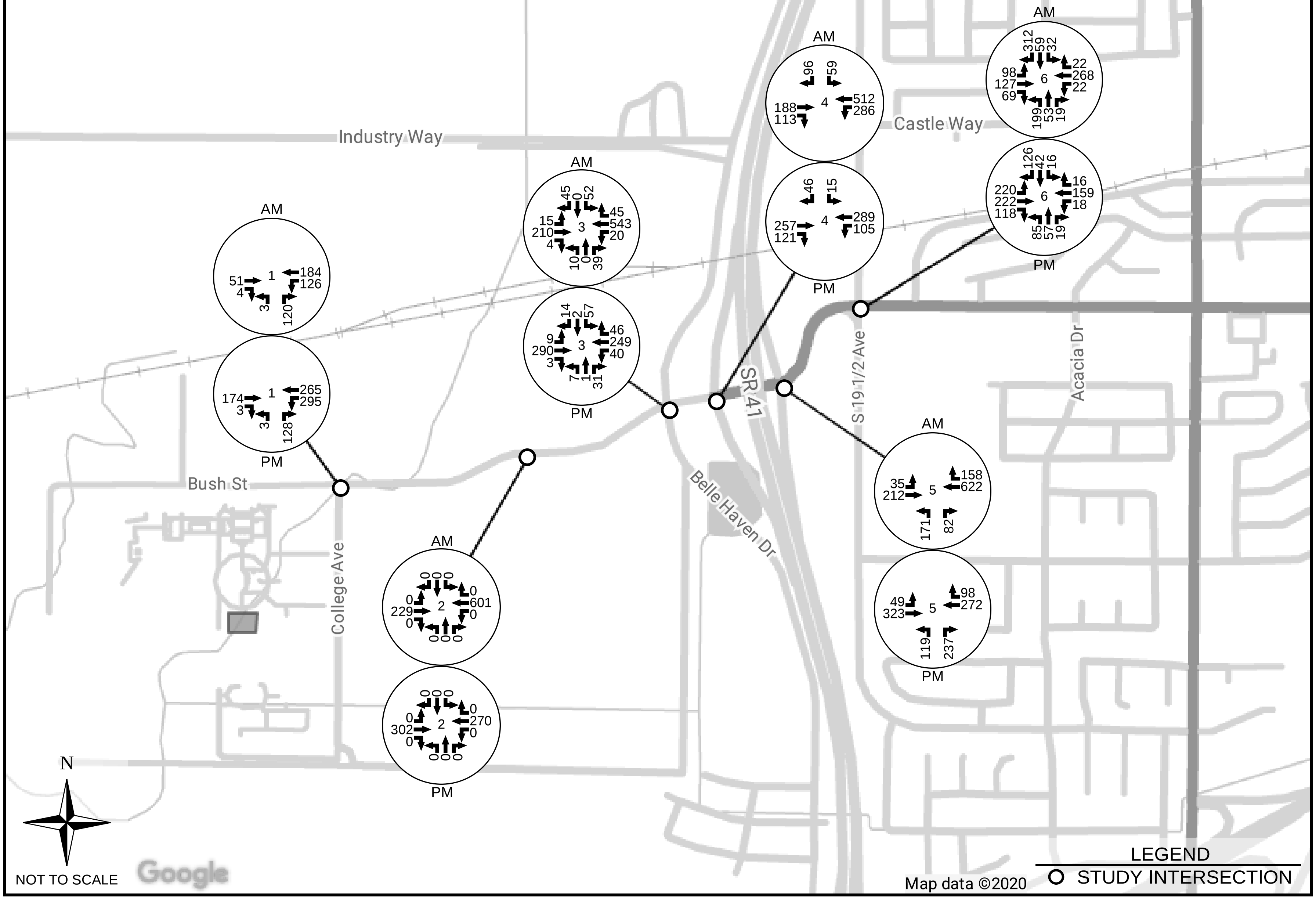


2020 PEAK HOUR TRAFFIC
FIGURE 5

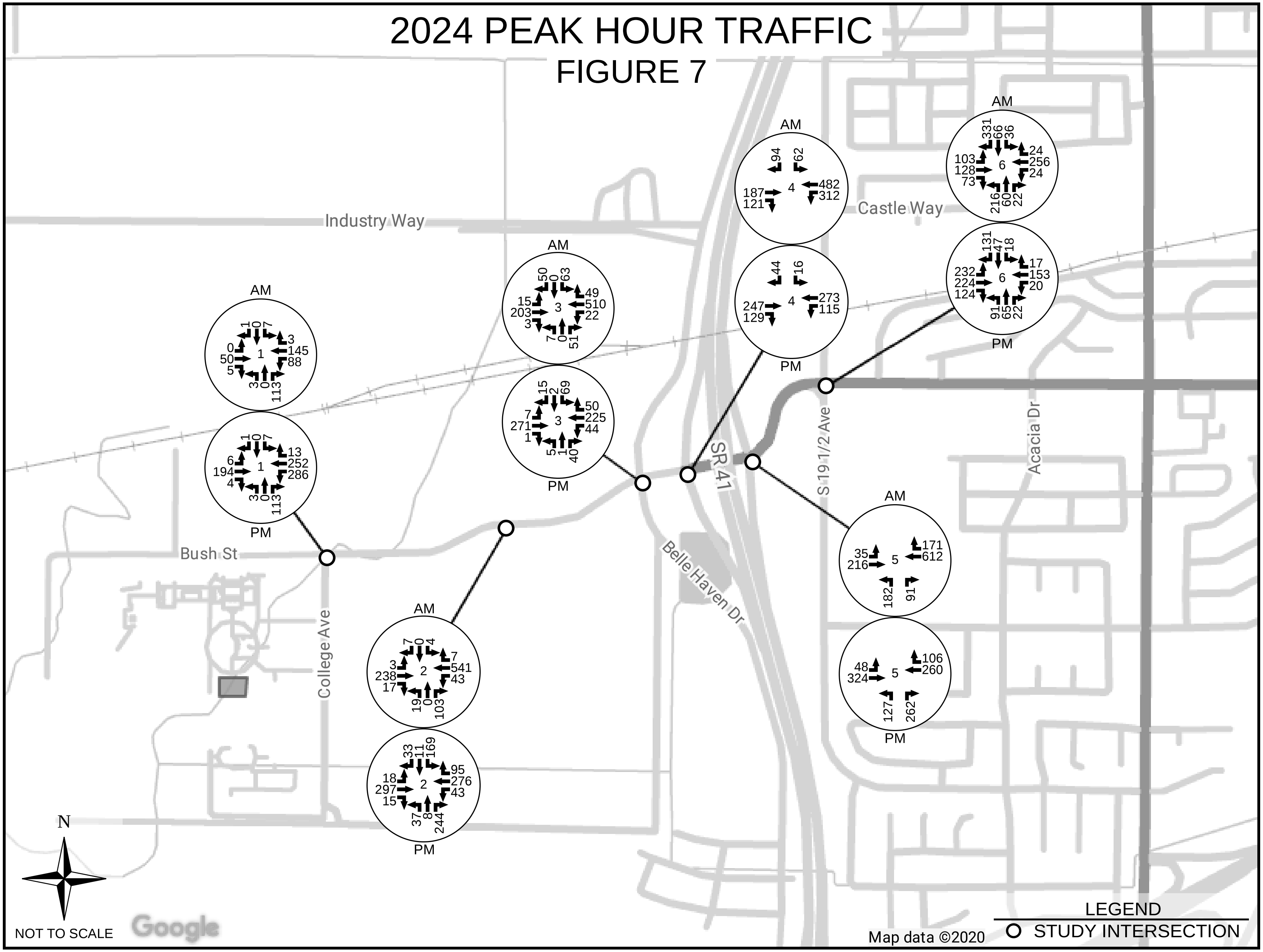


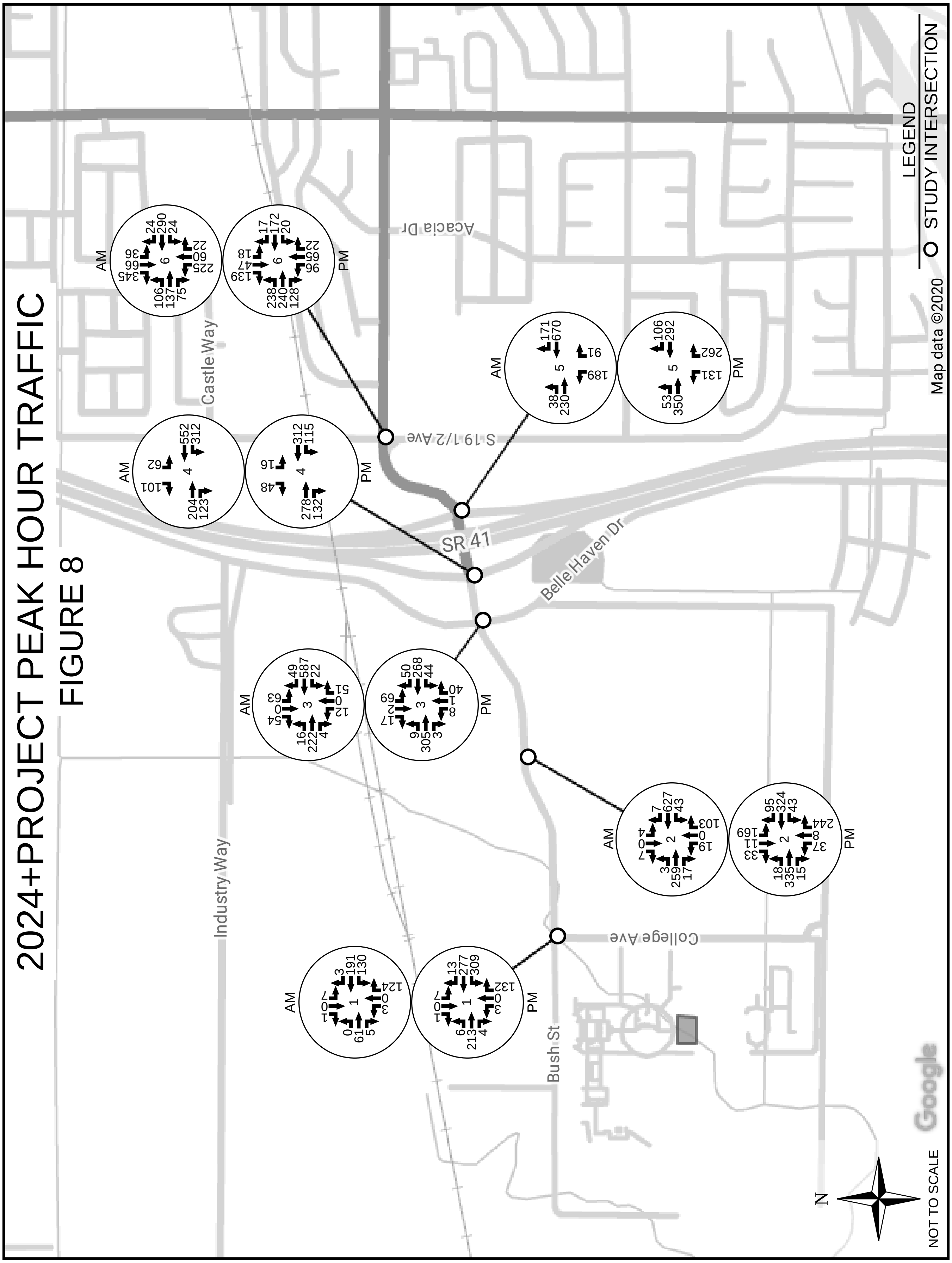
2020+PROJECT PEAK HOUR TRAFFIC

FIGURE 6

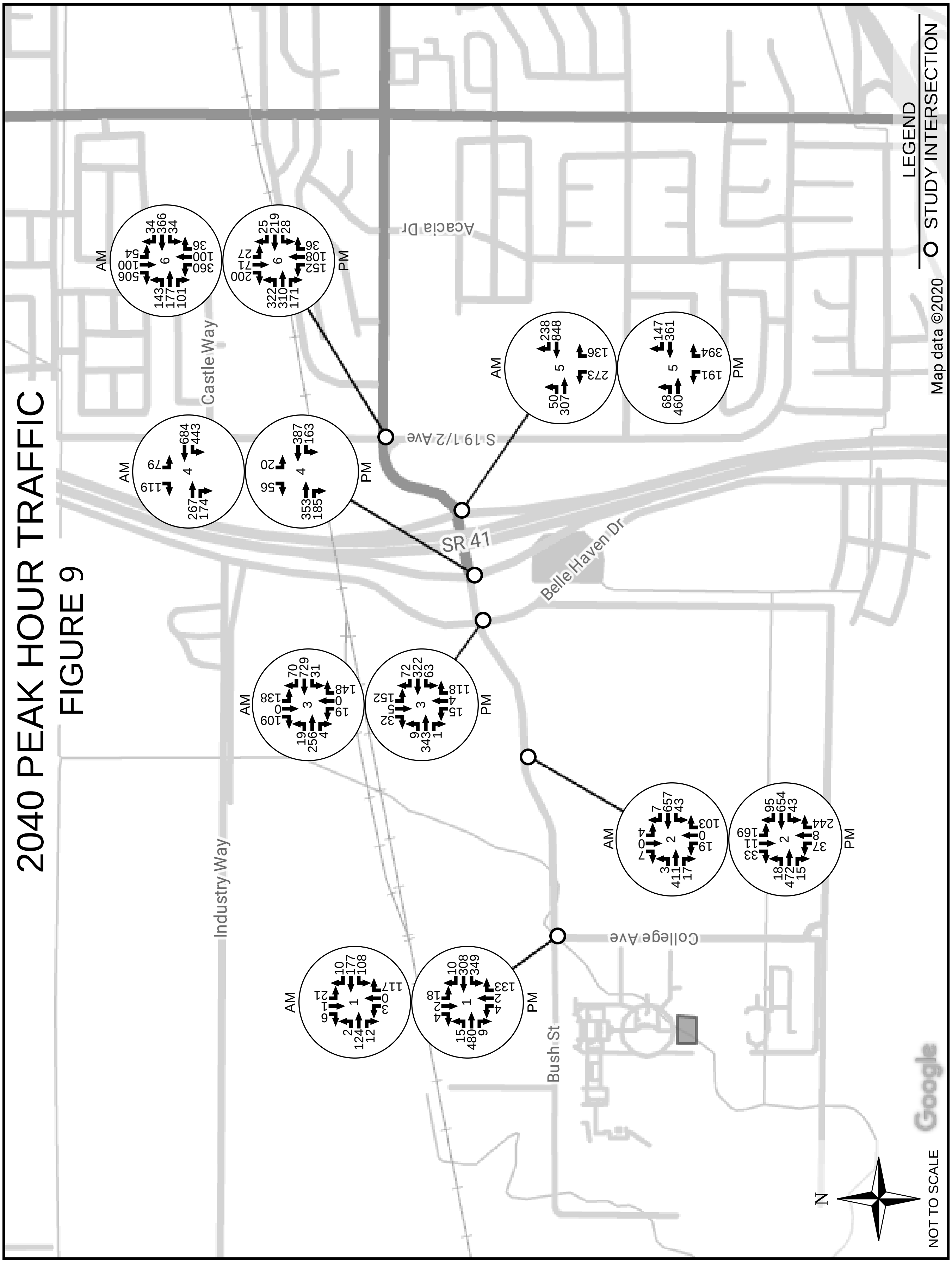


2024 PEAK HOUR TRAFFIC
FIGURE 7





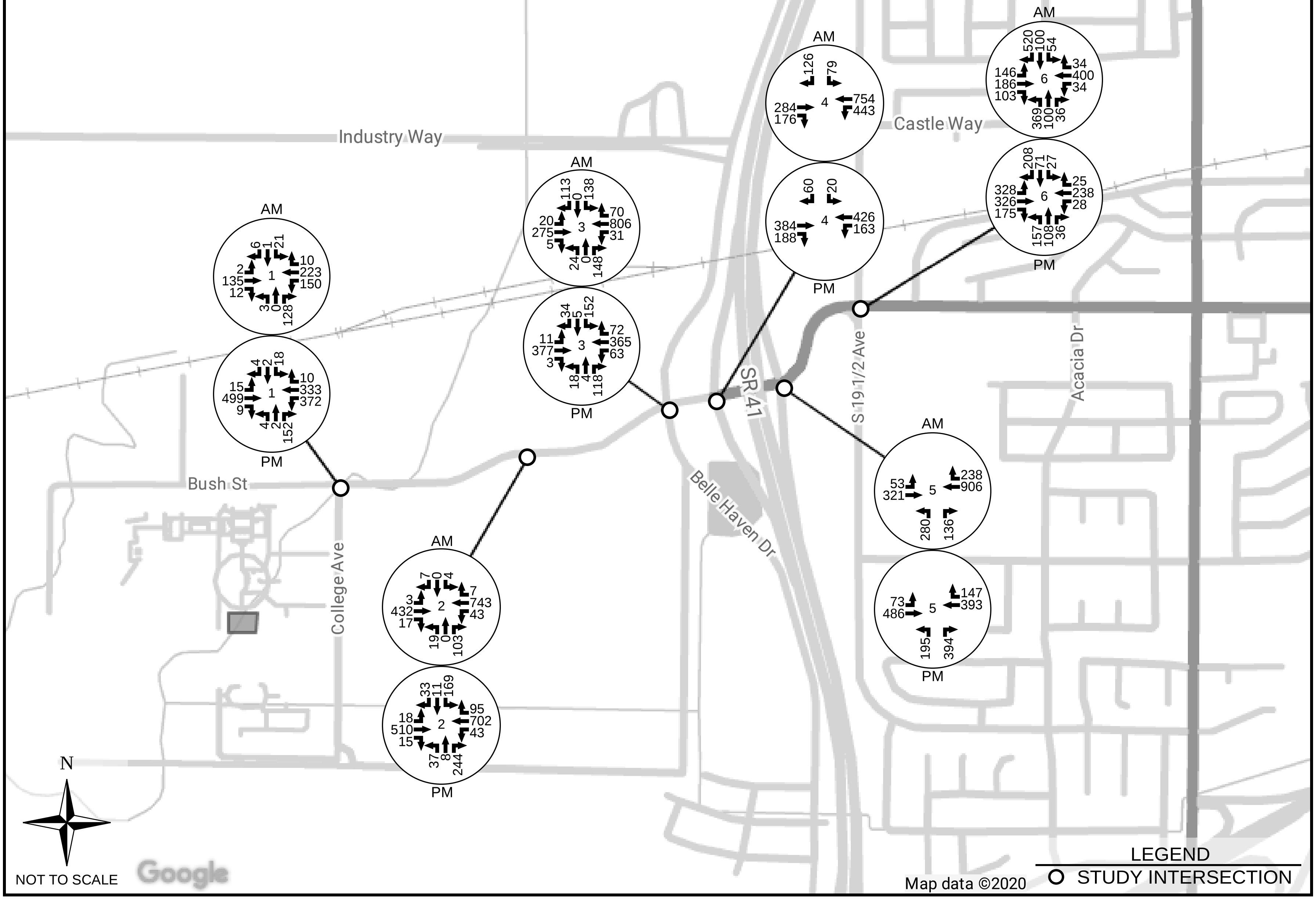
2024+PROJECT PEAK HOUR TRAFFIC
FIGURE 8



2040 PEAK HOUR TRAFFIC

FIGURE 9

2040+PROJECT PEAK HOUR TRAFFIC
FIGURE 10



INTERSECTION ANALYSIS

A capacity analysis of the study intersections was conducted using Synchro 9 software from Trafficware. This software utilizes the capacity analysis methodology in the Transportation Research Board's Highway Capacity Manual 2010 (HCM 2010). The analysis was performed for each of the following traffic scenarios.

- Existing (2020)
- Existing (2020) + Project
- Opening (2024)
- Opening (2024) + Project
- Future (2040)
- Future (2040) + Project

Level of service (LOS) criteria for unsignalized and signalized intersections, as defined in HCM 2010, are presented in the tables below.

LEVEL OF SERVICE CRITERIA
UNSIGNALIZED INTERSECTION

Level of Service	Average Control Delay (sec/veh)	Expected Delay to Minor Street Traffic
A	≤ 10	Little or no delay
B	> 10 and ≤ 15	Short delays
C	> 15 and ≤ 25	Average delays
D	> 25 and ≤ 35	Long delays
E	> 35 and ≤ 50	Very long delays
F	> 50	Extreme delays

LEVEL OF SERVICE CRITERIA
SIGNALIZED INTERSECTIONS

Level of Service	Average Control Delay (sec/veh)	Volume-to-Capacity Ratio
A	≤ 10	< 0.60
B	> 10 and ≤ 20	0.61 - 0.70
C	> 20 and ≤ 35	0.71 - 0.80
D	> 35 and ≤ 55	0.81 - 0.90
E	> 55 and ≤ 80	0.91 - 1.00
F	> 80	> 1.00

Peak hour level of service for the study intersections is presented in Tables 3a and 3b.

Table 3a
Intersection Level of Service
Weekday PM Peak Hour

#	Intersection	Control	2020	2020+ Project	2024	2024+ Project	2040	2040+ Project	2040+ Project w/Mitigation[1]
1	Bush St & College Ave	NB SB	B -	B -	B A	B A	B A	C A	- -
2	Bush St & Semas Dr	NB SB	- -	- -	C F (273.5)	C F (>300)	F (96.7) F (>300)	F (144.7) F (>300)	- -
		Signal	-	-	-	-	-	-	C
3	Bush St & Belle Haven Dr	AWSC	B	B	B	B	C	D (28.5)	C
4	Bush St & SR 41 SB Ramps	SB	B	B	B	B	C	C	C
5	Bush St & SR 41 NB Ramps	NB	B	B	B	C	D (32.5)	E (38.8)	C
6	Bush St & S. 19 ½ Ave	AWSC	B	B	B	B	D (26.7)	D (30.5)	B

[1] Mitigation shown in Table 8

Table 3b
Intersection Level of Service
Weekday AM Peak Hour

#	Intersection	Control	2020	2020+ Project	2024	2024+ Project	2040	2040+ Project	2040+ Project w/Mitigation¹
1	Bush St & College Ave	NB SB	A -	A -	A A	A A	A A	A A	- -
2	Bush St & Semas Dr	NB SB	- -	- -	B C	B C	C C	C D (28.5)	- -
		Signal	-	-	-	-	-	-	C
3	Bush St & Belle Haven Dr	AWSC	B	B	B	C	E (46.5)	F (51.6)	C
4	Bush St & SR 41 SB Ramps	SB	D (33.8)	E (41.1)	F (50.2)	F (63.9)	F (>300)	F (>300)	C
5	Bush St & SR 41 NB Ramps	NB	C	C	C	C	F (92.2)	F (127.8)	C
6	Bush St & S. 19 ½ Ave	AWSC	C	C	C	D (25.1)	F (57.9)	F (58.6)	C

[1] Mitigation shown in Table 8

.

QUEUE LENGTH ANALYSIS

Existing and future peak hour volumes, both with and without project traffic, were used to analyze whether traffic queues exceed storage capacities at four of the five study intersections. The queue length analysis was conducted using Synchro 9 and SimTraffic software. The analysis results shown in Tables 4a and 4b are provided for informational purposes only. All lengths are reported in feet.

Table 4a
Queue Length Analysis
Weekday PM Peak Hour

Intersection	Bush St & SR 41 SB Ramps			Bush St & SR 41 NB Ramps		
Movement	WBL	SBL	SBR	EBL	NBL	NBR
Storage Capacity	250	1300	500	100	1200	500
2020	47	32	33	36	64	78
2020+Project	46	30	39	36	61	70
2024	41	36	36	30	74	98
2024+Project	46	27	37	44	84	90
2040	61	39	38	48	182	218
2040+Project	60	28	44	43	198	246

Table 4b
Queue Length Analysis
Weekday AM Peak Hour

Intersection	Bush St & SR 41 SB Ramps			Bush St & SR 41 NB Ramps		
Movement	WBL	SBL	SBR	EBL	NBL	NBR
Storage Capacity	250	1300	500	100	1200	500
2020	57	66	49	31	89	44
2020+Project	92	58	41	41	88	44
2024	77	55	45	33	94	41
2024+Project	70	71	43	35	175	47
2040	167	116	54	42	429	325
2040+Project	118	105	53	55	411	456

TRAFFIC SIGNAL WARRANT ANALYSIS

Peak hour signal warrants were evaluated for each of the unsignalized intersections within the study based on the 2014 California Manual on Uniform Traffic Control Devices (2014 CA MUTCD). Peak hour signal warrants assess delay to traffic on minor street approaches when entering or crossing a major street. Signal warrant analysis results are shown in Tables 5a and 5b.

Table 5a
Traffic Signal Warrants
Weekday PM Peak Hour

		2020			2020+Project			2024			2024+Project			2040			2040+Project		
#	Intersection	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
1	College Ave at Bush St	670	112	NO	737	131	NO	755	116	NO	822	135	NO	1171	139	YES	1238	158	YES
2	Semas Dr at Bush St	-	-	-	-	-	-	744	289	YES	830	289	YES	1297	289	YES	1383	289	YES
3	Belle Haven Dr at Bush St	556	71	NO	637	73	NO	598	86	NO	679	88	NO	810	189	NO	891	191	YES
4	SR 41 SB Ramps at Bush St	699	57	NO	772	61	NO	764	60	NO	837	64	NO	1088	76	NO	1161	80	NO
5	SR 41 NB Ramps at Bush St	679	352	YES	742	356	YES	738	389	YES	801	393	YES	1036	585	YES	1099	589	YES
6	S 19 1/2 Ave at Bush St	708	176	NO	753	184	NO	770	196	NO	815	204	NO	1075	298	YES	1120	306	YES

Table 5b
Traffic Signal Warrants
Weekday AM Peak Hour

		2020			2020+Project			2024			2024+Project			2040			2040+Project		
#	Intersection	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
1	College Ave at Bush St	266	112	NO	365	123	NO	291	116	NO	390	127	NO	433	120	NO	532	131	NO
2	Semas Dr at Bush St	-	-	-	-	-	-	849	122	YES	956	122	YES	1138	122	YES	1245	122	YES
3	Belle Haven Dr at Bush St	739	93	NO	837	97	NO	802	113	NO	900	117	NO	1109	247	YES	1207	251	YES
4	SR 41 SB Ramps at Bush St	1010	148	YES	1099	155	YES	1102	156	YES	1191	163	YES	1568	198	YES	1657	205	YES
5	SR 41 NB Ramps at Bush St	952	246	YES	1027	253	YES	1034	273	YES	1109	280	YES	1443	409	YES	1518	416	YES
6	S 19 1/2 Ave at Bush St	651	280	NO	674	312	YES	731	304	YES	754	338	YES	1156	434	YES	1179	468	YES

It is important to note that a signal warrant defines the minimum condition under which signalization of an intersection might be warranted. Meeting this threshold does not suggest traffic signals are required, but rather, that other traffic factors and conditions be considered in order to determine whether signals are truly justified.

It is also noted that signal warrants do not necessarily correlate with level of service. An intersection may satisfy a signal warrant condition and operate at or above an acceptable level of service, or operate below an acceptable level of service and not meet signal warrant criteria.

ROADWAY ANALYSIS

A capacity analysis of the study roadways was conducted using HCS software from McTrans. This software utilizes the capacity analysis methodology in the Transportation Research Board's Highway Capacity Manual. The analysis was performed for the following AM and PM traffic scenarios:

- Existing (2020)
- Existing+Project (2020)
- Opening (2024)
- Opening+Project (2024)
- Future (2040)
- Future+Project (2040)

Table 6
Roadway Level of Service

Street	2020 Directional LOS		2024 Directional LOS		2040 Directional LOS	
	East AM/PM	West AM/PM	East AM/PM	West AM/PM	East AM/PM	West AM/PM
Bush St: College Ave to Semas Dr	A/B	C/B	B/B	B/B	C/C	C/C
Bush St: Semas Dr to Belle Haven Dr	B/B	B/B	B/B	B/B	C/B	C/B
Bush St: Belle Haven Dr to SR 41 SB	B/B	B/B	B/B	B/B	C/B	C/B
Bush St: SR 41 SB to SR 41 NB	A/A	A/A	A/A	A/A	A/A	B/A
Bush St: SR 41 NB to N 19 1/2 Ave	A/A	A/A	A/A	A/A	A/A	B/A

Street	2020+Project Directional LOS		2024+Project Directional LOS		2040+Project Directional LOS	
	East AM/PM	West AM/PM	East AM/PM	West AM/PM	East AM/PM	West AM/PM
Bush St: College Ave to Semas Dr	B/C	B/B	B/B	B/B	C/C	C/C
Bush St: Semas Dr to Belle Haven Dr	B/B	B/B	B/B	B/B	C/B	C/B
Bush St: Belle Haven Dr to SR 41 SB	B/B	B/B	B/B	C/B	C/C	C/C
Bush St: SR 41 SB to SR 41 NB	A/A	A/A	A/A	A/A	A/A	B/A
Bush St: SR 41 NB to N 19 1/2 Ave	A/A	A/A	A/A	A/A	A/A	B/A

VEHICLE MILES TRAVELED (VMT) ANALYSIS

An evaluation of vehicle miles traveled (VMT) for project traffic was conducted based on applicable California Environmental Quality Act (CEQA) Guidelines. The analysis involved comparing an estimate of VMT attributable to the project to a baseline VMT and assessing whether project VMT would result in a significant transportation impact. Following CEQA Guidelines, only passenger vehicles were included in the analysis.

Several factors were taken into consideration when estimating project VMT, including proposed land use, project trip type and distribution, and location of other land developments. 82.8% of project traffic is anticipated to be students, 15.7% of project traffic is anticipated to be faculty and staff, and 1.5% is anticipated to be heavy truck trips. Of the staff and faculty trips, 40% were anticipated to be local trips and 60% were anticipated to be traveling from other towns such as Hanford, Visalia, and Fresno. No pass-by trips are anticipated since there are no other land developments in the vicinity of the project.

As shown in Table 7, it is anticipated that the project would result in an average VMT of 5.49 miles per person. An average regional VMT of 8.37 miles per capita for the year 2020 was obtained from the Kings County 2018 Regional Transportation Plan. This baseline average was estimated based on population and travel characteristic projections for the KCAG transportation modeling area.

Table 7
Vehicle Miles Traveled

Trip Type	Project ADT	Weighted Average	Miles Traveled	VMT per Trip	Vehicle Occupancy	VMT per Person
Staff/Faculty	159	9.30	1,477	9.30	1	9.30
Student	838	4.0	3,352	4.0	1	4.0
Heavy Trucks	15	47.6	723	47.6	1	47.6
Total	1,012				Weighted Average	5.49

The average project VMT of 5.49 miles per person is more than 15% less than the baseline average VMT of 8.37 miles per capita. Therefore, the project does not to result in a significant transportation impact.

MITIGATION

Intersection and roadway improvements needed by the year 2040 to maintain or improve the operational level of service of the street system in the vicinity of the project are shown in Table 8.

Table 8
Future Intersection Improvements

#	Intersection	Total Improvements Required by 2040
2	Bush St & Semas Dr	Signal
3	Bush St & Belle Haven Dr	Signal
4	Bush St & SR 41 SB Ramps	Signal
5	Bush St & SR 41 NB Ramps	Signal
6	Bush St & S. 19 ½ Ave	Signal

SUMMARY AND CONCLUSIONS

This study evaluated the potential traffic impacts of a proposed Lemoore Community College campus expansion located south of Bush Street and west of College Avenue in Lemoore, California.

Level of Service Analysis

Bush Street and State Route 41 Southbound Ramps operates below an acceptable level of service in the existing year prior to the addition of project traffic. All other intersections within the scope of the study are anticipated to operate at an acceptable level of service prior to and with the addition of project traffic.

In 2024, Bush Street and Semas Drive is anticipated to operate below an acceptable level of service prior to the addition of project traffic. With the addition of project traffic, Bush Street and S. 19 ½ Avenue is anticipated to operate below an acceptable level of service. All other intersections within the scope of the study are anticipated to operate at an acceptable level of service prior to and with the addition of project traffic.

In 2040, Bush Street and Belle Haven Drive and Bush Street and State Route 41 Northbound Ramps are anticipated to operate below an acceptable level of service prior to the addition of project traffic. The remaining intersections within the scope of study are anticipated to operate at acceptable levels of service during the peak hour.

Roadway Capacity

All roadways within the project scope currently operate at acceptable levels of service and are expected to continue to do so with the addition of project traffic through the future year.

Vehicle Miles Traveled Evaluation

The average vehicle miles traveled (VMT) is lower than the regional VMT, therefore there are no impacts.

Conclusion

Based on the City of Lemoore standards for determining whether project traffic has a significant impact on intersections and roadways, the mitigation measures identified in Table 8 are anticipated to be needed in order to reduce the impacts for the listed facilities to less-than-significant levels in the year 2040.

REFERENCES

1. Annual Traffic Census, Kings County Associatioin of Governments (KCAG)
2. Highway Capacity Manual 2010, Transportation Research Board
3. California Manual on Uniform Traffic Control Devices for Streets and Highways, 2014 Edition, California Department of Transportation (Caltrans)
4. Trip Generation Manual, 10th Edition, Institute of Transportation Engineers (ITE)

APPENDIX

INTERSECTION LEVEL OF SERVICE

Intersection	
Int Delay, s/veh	4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	155	3	272	240	3	109
Future Vol, veh/h	155	3	272	240	3	109
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	400	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	168	3	296	261	3	118

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	168	0	1020	168
Stage 1	-	-	-	-	168	-
Stage 2	-	-	-	-	852	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1410	-	262	876
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	418	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1410	-	207	876
Mov Cap-2 Maneuver	-	-	-	-	207	-
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	330	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.4	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	806	-	-	1410	-
HCM Lane V/C Ratio	0.151	-	-	0.21	-
HCM Control Delay (s)	10.3	-	-	8.2	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.8	-

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	7	256	1	0	40	206	46	0	4	1	31
Future Vol, veh/h	0	7	256	1	0	40	206	46	0	4	1	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	8	278	1	0	43	224	50	0	4	1	34
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	12.8	10.1	9.1
HCM LOS	B	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	3%	28%	0%	100%	0%	0%
Vol Thru, %	0%	3%	97%	72%	69%	0%	100%	0%
Vol Right, %	0%	97%	0%	0%	31%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	32	264	143	149	57	2	12
LT Vol	4	0	7	40	0	57	0	0
Through Vol	0	1	256	103	103	0	2	0
RT Vol	0	31	1	0	46	0	0	12
Lane Flow Rate	4	35	287	155	162	62	2	13
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.009	0.057	0.444	0.246	0.24	0.12	0.004	0.021
Departure Headway (Hd)	7.11	5.908	5.672	5.792	5.434	6.961	6.453	5.742
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	506	609	640	623	666	518	558	627
Service Time	4.817	3.615	3.372	3.492	3.134	4.664	4.156	3.446
HCM Lane V/C Ratio	0.008	0.057	0.448	0.249	0.243	0.12	0.004	0.021
HCM Control Delay	9.9	9	12.8	10.4	9.8	10.6	9.2	8.6
HCM Lane LOS	A	A	B	B	A	B	A	A
HCM 95th-tile Q	0	0.2	2.3	1	0.9	0.4	0	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	57	2	12
Future Vol, veh/h	0	57	2	12
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	62	2	13
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	10.2
HCM LOS	B

Lane

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	226	118	105	250	0	0	0	0	15	0	42
Future Vol, veh/h	0	226	118	105	250	0	0	0	0	15	0	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	246	128	114	272	0	0	0	0	16	0	46

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	272	0	0	374	0	0				810	874	136
Stage 1	-	-	-	-	-	-				500	500	-
Stage 2	-	-	-	-	-	-				310	374	-
Critical Hdwy	4.14	-	-	4.12	-	-				6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-				5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-				3.519	4.019	3.319
Pot Cap-1 Maneuver	1288	-	-	1184	-	-				333	287	888
Stage 1	-	-	-	-	-	-				575	542	-
Stage 2	-	-	-	-	-	-				743	617	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1288	-	-	1184	-	-				301	0	888
Mov Cap-2 Maneuver	-	-	-	-	-	-				301	0	-
Stage 1	-	-	-	-	-	-				520	0	-
Stage 2	-	-	-	-	-	-				743	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.5	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1288	-	-	1184	-	-	301	888
HCM Lane V/C Ratio	-	-	-	0.096	-	-	0.054	0.051
HCM Control Delay (s)	0	-	-	8.4	-	-	17.6	9.3
HCM Lane LOS	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	0	-	-	0.3	-	-	0.2	0.2

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	44	297	0	0	240	98	115	0	237	0	0	0
Future Vol, veh/h	44	297	0	0	240	98	115	0	237	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	323	0	0	261	107	125	0	258	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	367	0	0	323	0	0	548	785	323
Stage 1	-	-	-	-	-	-	418	418	-
Stage 2	-	-	-	-	-	-	130	367	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	1188	-	-	1237	-	-	482	324	717
Stage 1	-	-	-	-	-	-	663	590	-
Stage 2	-	-	-	-	-	-	883	621	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1188	-	-	1237	-	-	463	0	717
Mov Cap-2 Maneuver	-	-	-	-	-	-	463	0	-
Stage 1	-	-	-	-	-	-	636	0	-
Stage 2	-	-	-	-	-	-	883	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.1	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	463	717	1188	-	-	1237	-	-
HCM Lane V/C Ratio	0.27	0.359	0.04	-	-	-	-	-
HCM Control Delay (s)	15.6	12.8	8.2	-	-	0	-	-
HCM Lane LOS	C	B	A	-	-	A	-	-
HCM 95th %tile Q(veh)	1.1	1.6	0.1	-	-	0	-	-

Intersection	
Intersection Delay, s/veh	12.3
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	214	206	114	0	18	140	16	0	80	57	19
Future Vol, veh/h	0	214	206	114	0	18	140	16	0	80	57	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	233	224	124	0	20	152	17	0	87	62	21
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	13	12.2	11.4
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	57	19	214	206	114	18	140	16	16	42
LT Vol	80	0	0	214	0	0	18	0	0	16	0
Through Vol	0	57	0	0	206	0	0	140	0	0	42
RT Vol	0	0	19	0	0	114	0	0	16	0	0
Lane Flow Rate	87	62	21	233	224	124	20	152	17	17	46
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.185	0.123	0.037	0.436	0.389	0.191	0.041	0.295	0.03	0.037	0.091
Departure Headway (Hd)	7.661	7.161	6.461	6.755	6.255	5.555	7.482	6.982	6.282	7.647	7.147
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	466	498	551	533	573	643	477	513	566	466	499
Service Time	5.442	4.942	4.242	4.516	4.016	3.316	5.259	4.759	4.059	5.422	4.922
HCM Lane V/C Ratio	0.187	0.124	0.038	0.437	0.391	0.193	0.042	0.296	0.03	0.036	0.092
HCM Control Delay	12.2	11	9.5	14.7	13	9.6	10.6	12.7	9.3	10.7	10.6
HCM Lane LOS	B	B	A	B	B	A	B	B	A	B	B
HCM 95th-tile Q	0.7	0.4	0.1	2.2	1.8	0.7	0.1	1.2	0.1	0.1	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	16	42	118
Future Vol, veh/h	0	16	42	118
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	17	46	128
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	11
HCM LOS	B

Lane	SBLn3

Intersection	
Int Delay, s/veh	4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	174	3	295	265	3	128
Future Vol, veh/h	174	3	295	265	3	128
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	400	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	189	3	321	288	3	139

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	189	0	1118	189
Stage 1	-	-	-	-	189	-
Stage 2	-	-	-	-	929	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1385	-	229	853
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	385	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1385	-	176	853
Mov Cap-2 Maneuver	-	-	-	-	176	-
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	296	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.4	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	784	-	-	1385	-
HCM Lane V/C Ratio	0.182	-	-	0.232	-
HCM Control Delay (s)	10.6	-	-	8.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	0.9	-

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	9	290	3	0	40	249	46	0	7	1	31
Future Vol, veh/h	0	9	290	3	0	40	249	46	0	7	1	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	10	315	3	0	43	271	50	0	8	1	34
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	14.9	10.8	9.5
HCM LOS	B	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	3%	24%	0%	100%	0%	0%
Vol Thru, %	0%	3%	96%	76%	73%	0%	100%	0%
Vol Right, %	0%	97%	1%	0%	27%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	32	302	165	171	57	2	14
LT Vol	7	0	9	40	0	57	0	0
Through Vol	0	1	290	125	125	0	2	0
RT Vol	0	31	3	0	46	0	0	14
Lane Flow Rate	8	35	328	179	185	62	2	15
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.016	0.06	0.53	0.294	0.288	0.125	0.004	0.026
Departure Headway (Hd)	7.411	6.205	5.809	5.916	5.604	7.255	6.746	6.033
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	483	577	620	608	641	494	530	593
Service Time	5.157	3.95	3.537	3.648	3.335	4.998	4.488	3.775
HCM Lane V/C Ratio	0.017	0.061	0.529	0.294	0.289	0.126	0.004	0.025
HCM Control Delay	10.3	9.3	14.9	11.1	10.6	11	9.5	8.9
HCM Lane LOS	B	A	B	B	B	B	A	A
HCM 95th-tile Q	0	0.2	3.1	1.2	1.2	0.4	0	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	57	2	14
Future Vol, veh/h	0	57	2	14
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	62	2	15
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	10.6
HCM LOS	B

Lane

HCM 2010 TWSC
4: SR 41 SB Ramps & Bush St

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Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	257	121	105	289	0	0	0	0	15	0	46
Future Vol, veh/h	0	257	121	105	289	0	0	0	0	15	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	279	132	114	314	0	0	0	0	16	0	50

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	314	0	0	411	0	0				887	953	157
Stage 1	-	-	-	-	-	-				542	542	-
Stage 2	-	-	-	-	-	-				345	411	-
Critical Hdwy	4.14	-	-	4.12	-	-				6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-				5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-				3.519	4.019	3.319
Pot Cap-1 Maneuver	1243	-	-	1148	-	-				299	258	861
Stage 1	-	-	-	-	-	-				548	519	-
Stage 2	-	-	-	-	-	-				716	594	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1243	-	-	1148	-	-				269	0	861
Mov Cap-2 Maneuver	-	-	-	-	-	-				269	0	-
Stage 1	-	-	-	-	-	-				494	0	-
Stage 2	-	-	-	-	-	-				716	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.3	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1243	-	-	1148	-	-	269	861
HCM Lane V/C Ratio	-	-	-	0.099	-	-	0.061	0.058
HCM Control Delay (s)	0	-	-	8.5	-	-	19.2	9.4
HCM Lane LOS	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	0	-	-	0.3	-	-	0.2	0.2

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	49	323	0	0	272	98	119	0	237	0	0	0
Future Vol, veh/h	49	323	0	0	272	98	119	0	237	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	53	351	0	0	296	107	129	0	258	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	402	0	0	351	0	0	606	860	351
Stage 1	-	-	-	-	-	-	458	458	-
Stage 2	-	-	-	-	-	-	148	402	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	1153	-	-	1208	-	-	444	293	692
Stage 1	-	-	-	-	-	-	636	566	-
Stage 2	-	-	-	-	-	-	865	600	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1153	-	-	1208	-	-	424	0	692
Mov Cap-2 Maneuver	-	-	-	-	-	-	424	0	-
Stage 1	-	-	-	-	-	-	607	0	-
Stage 2	-	-	-	-	-	-	865	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.1	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	424	692	1153	-	-	1208	-	-
HCM Lane V/C Ratio	0.305	0.372	0.046	-	-	-	-	-
HCM Control Delay (s)	17.2	13.3	8.3	-	-	0	-	-
HCM Lane LOS	C	B	A	-	-	A	-	-
HCM 95th %tile Q(veh)	1.3	1.7	0.1	-	-	0	-	-

Intersection	
Intersection Delay, s/veh	12.9
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	220	222	118	0	18	159	16	0	85	57	19
Future Vol, veh/h	0	220	222	118	0	18	159	16	0	85	57	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	239	241	128	0	20	173	17	0	92	62	21
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	13.6	13	11.8
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	85	57	19	220	222	118	18	159	16	16	42
LT Vol	85	0	0	220	0	0	18	0	0	16	0
Through Vol	0	57	0	0	222	0	0	159	0	0	42
RT Vol	0	0	19	0	0	118	0	0	16	0	0
Lane Flow Rate	92	62	21	239	241	128	20	173	17	17	46
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.201	0.126	0.038	0.457	0.428	0.203	0.041	0.342	0.031	0.038	0.093
Departure Headway (Hd)	7.84	7.34	6.64	6.884	6.384	5.684	7.617	7.117	6.417	7.818	7.318
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	455	485	535	521	562	627	467	501	553	455	487
Service Time	5.634	5.134	4.434	4.655	4.155	3.455	5.408	4.908	4.208	5.607	5.107
HCM Lane V/C Ratio	0.202	0.128	0.039	0.459	0.429	0.204	0.043	0.345	0.031	0.037	0.094
HCM Control Delay	12.6	11.2	9.7	15.4	13.9	9.9	10.7	13.6	9.4	10.9	10.9
HCM Lane LOS	B	B	A	C	B	A	B	B	A	B	B
HCM 95th-tile Q	0.7	0.4	0.1	2.4	2.1	0.8	0.1	1.5	0.1	0.1	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	16	42	126
Future Vol, veh/h	0	16	42	126
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	17	46	137
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	11.4
HCM LOS	B

Lane	SBLn3

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	6	194	4	286	252	13	3	0	113	7	0	1
Future Vol, veh/h	6	194	4	286	252	13	3	0	113	7	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	150	400	-	150	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	211	4	311	274	14	3	0	123	8	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	274	0	0	211	0	0	1120	1120	211	1181	1120	274
Stage 1	-	-	-	-	-	-	224	224	-	896	896	-
Stage 2	-	-	-	-	-	-	896	896	-	285	224	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1289	-	-	1360	-	-	184	206	829	167	206	765
Stage 1	-	-	-	-	-	-	779	718	-	335	359	-
Stage 2	-	-	-	-	-	-	335	359	-	722	718	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1289	-	-	1360	-	-	151	158	829	117	158	765
Mov Cap-2 Maneuver	-	-	-	-	-	-	151	158	-	117	158	-
Stage 1	-	-	-	-	-	-	775	714	-	333	277	-
Stage 2	-	-	-	-	-	-	258	277	-	612	714	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	4.4	10.6	34.4
HCM LOS			B	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	151	829	1289	-	-	1360	-	-	117	765
HCM Lane V/C Ratio	0.022	0.148	0.005	-	-	0.229	-	-	0.065	0.001
HCM Control Delay (s)	29.4	10.1	7.8	-	-	8.4	-	-	37.9	9.7
HCM Lane LOS	D	B	A	-	-	A	-	-	E	A
HCM 95th %tile Q(veh)	0.1	0.5	0	-	-	0.9	-	-	0.2	0

HCM 2010 TWSC
2: Semas Dr & Bush St

PM 2024
12/22/2020

Intersection	
Int Delay, s/veh	51.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	18	297	15	43	276	95	37	8	244	169	11	33
Future Vol, veh/h	18	297	15	43	276	95	37	8	244	169	11	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	323	16	47	300	103	40	9	265	184	12	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	403	0	0	339	0	0	839	867	331	952	823	352
Stage 1	-	-	-	-	-	-	370	370	-	445	445	-
Stage 2	-	-	-	-	-	-	469	497	-	507	378	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1156	-	-	1220	-	-	285	291	711	239	309	692
Stage 1	-	-	-	-	-	-	650	620	-	592	575	-
Stage 2	-	-	-	-	-	-	575	545	-	548	615	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1156	-	-	1220	-	-	248	271	711	~ 138	287	692
Mov Cap-2 Maneuver	-	-	-	-	-	-	248	271	-	~ 138	287	-
Stage 1	-	-	-	-	-	-	636	607	-	580	546	-
Stage 2	-	-	-	-	-	-	507	518	-	332	602	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.8	19.7	273.5
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	554	1156	-	-	1220	-	-	163
HCM Lane V/C Ratio	0.567	0.017	-	-	0.038	-	-	1.42
HCM Control Delay (s)	19.7	8.2	0	-	8.1	0	-	273.5
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	3.5	0.1	-	-	0.1	-	-	14.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	12
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	7	271	1	0	44	225	50	0	5	1	40
Future Vol, veh/h	0	7	271	1	0	44	225	50	0	5	1	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	8	295	1	0	48	245	54	0	5	1	43
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	14.2	10.7	9.5
HCM LOS	B	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	3%	28%	0%	100%	0%	0%
Vol Thru, %	0%	2%	97%	72%	69%	0%	100%	0%
Vol Right, %	0%	98%	0%	0%	31%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	41	279	157	163	69	2	15
LT Vol	5	0	7	44	0	69	0	0
Through Vol	0	1	271	113	113	0	2	0
RT Vol	0	40	1	0	50	0	0	15
Lane Flow Rate	5	45	303	170	177	75	2	16
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.011	0.076	0.493	0.281	0.275	0.149	0.004	0.027
Departure Headway (Hd)	7.341	6.131	5.851	5.955	5.596	7.166	6.657	5.945
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	488	584	616	604	643	501	538	602
Service Time	5.085	3.875	3.578	3.682	3.324	4.905	4.397	3.684
HCM Lane V/C Ratio	0.01	0.077	0.492	0.281	0.275	0.15	0.004	0.027
HCM Control Delay	10.2	9.4	14.2	11	10.4	11.2	9.4	8.8
HCM Lane LOS	B	A	B	B	B	B	A	A
HCM 95th-tile Q	0	0.2	2.7	1.1	1.1	0.5	0	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	69	2	15
Future Vol, veh/h	0	69	2	15
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	75	2	16
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	10.7
HCM LOS	B

Lane

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	247	129	115	273	0	0	0	0	16	0	44
Future Vol, veh/h	0	247	129	115	273	0	0	0	0	16	0	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	268	140	125	297	0	0	0	0	17	0	48

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	297	0	0	409	0	0				886	956	148
Stage 1	-	-	-	-	-	-				547	547	-
Stage 2	-	-	-	-	-	-				339	409	-
Critical Hdwy	4.14	-	-	4.12	-	-				6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-				5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-				3.519	4.019	3.319
Pot Cap-1 Maneuver	1261	-	-	1150	-	-				299	257	873
Stage 1	-	-	-	-	-	-				545	517	-
Stage 2	-	-	-	-	-	-				721	595	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1261	-	-	1150	-	-				267	0	873
Mov Cap-2 Maneuver	-	-	-	-	-	-				267	0	-
Stage 1	-	-	-	-	-	-				486	0	-
Stage 2	-	-	-	-	-	-				721	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.5	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1261	-	-	1150	-	-	267	873
HCM Lane V/C Ratio	-	-	-	0.109	-	-	0.065	0.055
HCM Control Delay (s)	0	-	-	8.5	-	-	19.4	9.4
HCM Lane LOS	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	0	-	-	0.4	-	-	0.2	0.2

5: SR 41 NB Ramps & Bush St

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	48	324	0	0	260	106	127	0	262	0	0	0
Future Vol, veh/h	48	324	0	0	260	106	127	0	262	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	52	352	0	0	283	115	138	0	285	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	398	0	0	352	0	0	598	855	352
Stage 1	-	-	-	-	-	-	457	457	-
Stage 2	-	-	-	-	-	-	141	398	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	1157	-	-	1207	-	-	449	295	691
Stage 1	-	-	-	-	-	-	637	567	-
Stage 2	-	-	-	-	-	-	872	602	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1157	-	-	1207	-	-	429	0	691
Mov Cap-2 Maneuver	-	-	-	-	-	-	429	0	-
Stage 1	-	-	-	-	-	-	608	0	-
Stage 2	-	-	-	-	-	-	872	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.1	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	429	691	1157	-	-	1207	-	-
HCM Lane V/C Ratio	0.322	0.412	0.045	-	-	-	-	-
HCM Control Delay (s)	17.3	13.8	8.3	-	-	0	-	-
HCM Lane LOS	C	B	A	-	-	A	-	-
HCM 95th %tile Q(veh)	1.4	2	0.1	-	-	0	-	-

6: S 19 1/2 Ave & Bush St

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	232	224	124	0	20	153	17	0	91	65	22
Future Vol, veh/h	0	232	224	124	0	20	153	17	0	91	65	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	252	243	135	0	22	166	18	0	99	71	24
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	14.3	13.2	12.1
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	91	65	22	232	224	124	20	153	17	18	47
LT Vol	91	0	0	232	0	0	20	0	0	18	0
Through Vol	0	65	0	0	224	0	0	153	0	0	47
RT Vol	0	0	22	0	0	124	0	0	17	0	0
Lane Flow Rate	99	71	24	252	243	135	22	166	18	20	51
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.221	0.148	0.045	0.49	0.439	0.217	0.048	0.341	0.034	0.043	0.107
Departure Headway (Hd)	8.043	7.543	6.843	6.995	6.495	5.795	7.885	7.385	6.685	8.049	7.533
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	448	478	526	512	550	613	456	489	538	447	478
Service Time	5.755	5.255	4.555	4.792	4.292	3.592	5.596	5.096	4.396	5.749	5.249
HCM Lane V/C Ratio	0.221	0.149	0.046	0.492	0.442	0.22	0.048	0.339	0.033	0.045	0.107
HCM Control Delay	13	11.6	9.9	16.4	14.3	10.2	11	13.9	9.6	11.1	11.2
HCM Lane LOS	B	B	A	C	B	B	B	B	A	B	B
HCM 95th-tile Q	0.8	0.5	0.1	2.7	2.2	0.8	0.2	1.5	0.1	0.1	0.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	18	47	131
Future Vol, veh/h	0	18	47	131
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	20	51	142
Number of Lanes	0	1	1	1

Approach		SB
Opposing Approach		NB
Opposing Lanes		3
Conflicting Approach Left		WB
Conflicting Lanes Left		3
Conflicting Approach Right		EB
Conflicting Lanes Right		3
HCM Control Delay		11.7
HCM LOS		B

Lane	SBLn3

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	6	213	4	309	277	13	3	0	132	7	0	1
Future Vol, veh/h	6	213	4	309	277	13	3	0	132	7	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	150	400	-	150	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	232	4	336	301	14	3	0	143	8	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	301	0	0	232	0	0	1218	1218	232	1289	1218	301
Stage 1	-	-	-	-	-	-	245	245	-	973	973	-
Stage 2	-	-	-	-	-	-	973	973	-	316	245	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1260	-	-	1336	-	-	157	181	807	141	181	739
Stage 1	-	-	-	-	-	-	759	703	-	303	330	-
Stage 2	-	-	-	-	-	-	303	330	-	695	703	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1260	-	-	1336	-	-	126	135	807	93	135	739
Mov Cap-2 Maneuver	-	-	-	-	-	-	126	135	-	93	135	-
Stage 1	-	-	-	-	-	-	755	699	-	301	247	-
Stage 2	-	-	-	-	-	-	226	247	-	568	699	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	4.4	10.9	42.5
HCM LOS			B	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	126	807	1260	-	-	1336	-	-	93	739
HCM Lane V/C Ratio	0.026	0.178	0.005	-	-	0.251	-	-	0.082	0.001
HCM Control Delay (s)	34.3	10.4	7.9	-	-	8.6	-	-	47.1	9.9
HCM Lane LOS	D	B	A	-	-	A	-	-	E	A
HCM 95th %tile Q(veh)	0.1	0.6	0	-	-	1	-	-	0.3	0

Intersection	
Int Delay, s/veh	69.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	18	335	15	43	324	95	37	8	244	169	11	33
Future Vol, veh/h	18	335	15	43	324	95	37	8	244	169	11	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	364	16	47	352	103	40	9	265	184	12	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	455	0	0	380	0	0	932	960	372	1045	917	404
Stage 1	-	-	-	-	-	-	411	411	-	497	497	-
Stage 2	-	-	-	-	-	-	521	549	-	548	420	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1106	-	-	1178	-	-	247	257	674	207	272	647
Stage 1	-	-	-	-	-	-	618	595	-	555	545	-
Stage 2	-	-	-	-	-	-	539	516	-	521	589	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1106	-	-	1178	-	-	212	238	674	~ 115	251	647
Mov Cap-2 Maneuver	-	-	-	-	-	-	212	238	-	~ 115	251	-
Stage 1	-	-	-	-	-	-	604	581	-	542	516	-
Stage 2	-	-	-	-	-	-	470	488	-	304	575	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.8	23	$ 402.2
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	507	1106	-	-	1178	-	-	136
HCM Lane V/C Ratio	0.62	0.018	-	-	0.04	-	-	1.702
HCM Control Delay (s)	23	8.3	0	-	8.2	0	-	$ 402.2
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	4.2	0.1	-	-	0.1	-	-	17

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	9	305	3	0	44	268	50	0	8	1	40
Future Vol, veh/h	0	9	305	3	0	44	268	50	0	8	1	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	10	332	3	0	48	291	54	0	9	1	43
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	16.6	11.5	9.9
HCM LOS	C	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	3%	25%	0%	100%	0%	0%
Vol Thru, %	0%	2%	96%	75%	73%	0%	100%	0%
Vol Right, %	0%	98%	1%	0%	27%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	8	41	317	178	184	69	2	17
LT Vol	8	0	9	44	0	69	0	0
Through Vol	0	1	305	134	134	0	2	0
RT Vol	0	40	3	0	50	0	0	17
Lane Flow Rate	9	45	345	193	200	75	2	18
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.018	0.08	0.575	0.328	0.321	0.156	0.004	0.032
Departure Headway (Hd)	7.648	6.434	6.003	6.1	5.783	7.466	6.956	6.242
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	467	555	600	590	622	480	514	572
Service Time	5.409	4.195	3.742	3.84	3.523	5.221	4.711	3.997
HCM Lane V/C Ratio	0.019	0.081	0.575	0.327	0.322	0.156	0.004	0.031
HCM Control Delay	10.6	9.8	16.6	11.8	11.3	11.6	9.7	9.2
HCM Lane LOS	B	A	C	B	B	B	A	A
HCM 95th-tile Q	0.1	0.3	3.6	1.4	1.4	0.5	0	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	69	2	17
Future Vol, veh/h	0	69	2	17
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	75	2	18
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11.1
HCM LOS	B

Lane

HCM 2010 TWSC
4: SR 41 SB Ramps & Bush St

PM 2024+Project
12/22/2020

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	278	132	115	312	0	0	0	0	16	0	48
Future Vol, veh/h	0	278	132	115	312	0	0	0	0	16	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	302	143	125	339	0	0	0	0	17	0	52

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	339	0	0	446	0	0	963	1035	170
Stage 1	-	-	-	-	-	-	589	589	-
Stage 2	-	-	-	-	-	-	374	446	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	1217	-	-	1114	-	-	268	231	845
Stage 1	-	-	-	-	-	-	518	495	-
Stage 2	-	-	-	-	-	-	695	573	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1217	-	-	1114	-	-	238	0	845
Mov Cap-2 Maneuver	-	-	-	-	-	-	238	0	-
Stage 1	-	-	-	-	-	-	460	0	-
Stage 2	-	-	-	-	-	-	695	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.3	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1217	-	-	1114	-	-	238	845
HCM Lane V/C Ratio	-	-	-	0.112	-	-	0.073	0.062
HCM Control Delay (s)	0	-	-	8.6	-	-	21.3	9.5
HCM Lane LOS	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	0	-	-	0.4	-	-	0.2	0.2

HCM 2010 TWSC
5: SR 41 NB Ramps & Bush St

PM 2024+Project
12/22/2020

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	53	350	0	0	292	106	131	0	262	0	0	0
Future Vol, veh/h	53	350	0	0	292	106	131	0	262	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	380	0	0	317	115	142	0	285	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	433	0	0	380	0	0	655	929	380
Stage 1	-	-	-	-	-	-	496	496	-
Stage 2	-	-	-	-	-	-	159	433	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	1123	-	-	1178	-	-	415	267	666
Stage 1	-	-	-	-	-	-	611	544	-
Stage 2	-	-	-	-	-	-	854	581	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1123	-	-	1178	-	-	394	0	666
Mov Cap-2 Maneuver	-	-	-	-	-	-	394	0	-
Stage 1	-	-	-	-	-	-	579	0	-
Stage 2	-	-	-	-	-	-	854	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.1	0	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	394	666	1123	-	-	1178	-	-
HCM Lane V/C Ratio	0.361	0.428	0.051	-	-	-	-	-
HCM Control Delay (s)	19.2	14.4	8.4	-	-	0	-	-
HCM Lane LOS	C	B	A	-	-	A	-	-
HCM 95th %tile Q(veh)	1.6	2.1	0.2	-	-	0	-	-

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	238	240	128	0	20	172	17	0	96	65	22
Future Vol, veh/h	0	238	240	128	0	20	172	17	0	96	65	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	259	261	139	0	22	187	18	0	104	71	24
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	15.2	14.3	12.5
HCM LOS	C	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	96	65	22	238	240	128	20	172	17	18	47
LT Vol	96	0	0	238	0	0	20	0	0	18	0
Through Vol	0	65	0	0	240	0	0	172	0	0	47
RT Vol	0	0	22	0	0	128	0	0	17	0	0
Lane Flow Rate	104	71	24	259	261	139	22	187	18	20	51
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.239	0.152	0.047	0.512	0.48	0.229	0.049	0.392	0.035	0.045	0.11
Departure Headway (Hd)	8.243	7.743	7.043	7.255	6.755	6.055	8.042	7.542	6.842	8.225	7.725
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	437	465	510	499	537	597	447	479	525	437	465
Service Time	5.964	5.464	4.764	4.955	4.455	3.755	5.766	5.266	4.566	5.944	5.444
HCM Lane V/C Ratio	0.238	0.153	0.047	0.519	0.486	0.233	0.049	0.39	0.034	0.046	0.11
HCM Control Delay	13.5	11.9	10.1	17.3	15.5	10.5	11.2	15.1	9.8	11.3	11.4
HCM Lane LOS	B	B	B	C	C	B	B	C	A	B	B
HCM 95th-tile Q	0.9	0.5	0.1	2.9	2.6	0.9	0.2	1.8	0.1	0.1	0.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	18	47	139
Future Vol, veh/h	0	18	47	139
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	20	51	151
Number of Lanes	0	1	1	1

Approach		SB
Opposing Approach		NB
Opposing Lanes		3
Conflicting Approach Left		WB
Conflicting Lanes Left		3
Conflicting Approach Right		EB
Conflicting Lanes Right		3
HCM Control Delay		12.3
HCM LOS		B

Lane	SBLn3

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	15	480	9	349	308	10	4	2	133	18	2	4
Future Vol, veh/h	15	480	9	349	308	10	4	2	133	18	2	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	150	400	-	150	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	522	10	379	335	11	4	2	145	20	2	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	335	0	0	522	0	0	1651	1647	522	1721	1647	335
Stage 1	-	-	-	-	-	-	554	554	-	1093	1093	-
Stage 2	-	-	-	-	-	-	1097	1093	-	628	554	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1224	-	-	1044	-	-	79	99	555	70	99	707
Stage 1	-	-	-	-	-	-	517	514	-	260	290	-
Stage 2	-	-	-	-	-	-	258	290	-	471	514	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1224	-	-	1044	-	-	54	62	555	36	62	707
Mov Cap-2 Maneuver	-	-	-	-	-	-	54	62	-	36	62	-
Stage 1	-	-	-	-	-	-	510	507	-	257	185	-
Stage 2	-	-	-	-	-	-	161	185	-	342	507	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	5.4	17.1	149.3
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	54	497	1224	-	-	1044	-	-	36	158
HCM Lane V/C Ratio	0.081	0.295	0.013	-	-	0.363	-	-	0.543	0.041
HCM Control Delay (s)	77.4	15.3	8	-	-	10.4	-	-	189.4	28.8
HCM Lane LOS	F	C	A	-	-	B	-	-	F	D
HCM 95th %tile Q(veh)	0.3	1.2	0	-	-	1.7	-	-	1.9	0.1

Intersection	
Int Delay, s/veh	228.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	18	472	15	43	654	95	37	8	244	169	11	33
Future Vol, veh/h	18	472	15	43	654	95	37	8	244	169	11	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	513	16	47	711	103	40	9	265	184	12	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	814	0	0	529	0	0	1440	1468	521	1553	1424	763
Stage 1	-	-	-	-	-	-	560	560	-	856	856	-
Stage 2	-	-	-	-	-	-	880	908	-	697	568	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	813	-	-	1038	-	-	111	128	555	~ 92	136	404
Stage 1	-	-	-	-	-	-	513	511	-	352	374	-
Stage 2	-	-	-	-	-	-	342	354	-	431	506	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	813	-	-	1038	-	-	85	113	555	~ 41	120	404
Mov Cap-2 Maneuver	-	-	-	-	-	-	85	113	-	~ 41	120	-
Stage 1	-	-	-	-	-	-	495	493	-	340	343	-
Stage 2	-	-	-	-	-	-	276	324	-	213	488	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.5	96.7	$ 1797.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	306	813	-	-	1038	-	-	50
HCM Lane V/C Ratio	1.027	0.024	-	-	0.045	-	-	4.63
HCM Control Delay (s)	96.7	9.5	0	-	8.6	0	-	$ 1797.9
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	11.4	0.1	-	-	0.1	-	-	26

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	21.7
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	9	343	1	0	63	322	72	0	15	4	118
Future Vol, veh/h	0	9	343	1	0	63	322	72	0	15	4	118
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	10	373	1	0	68	350	78	0	16	4	128
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	33.4	17.3	13.6
HCM LOS	D	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	3%	28%	0%	100%	0%	0%
Vol Thru, %	0%	3%	97%	72%	69%	0%	100%	0%
Vol Right, %	0%	97%	0%	0%	31%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	122	353	224	233	152	5	32
LT Vol	15	0	9	63	0	152	0	0
Through Vol	0	4	343	161	161	0	5	0
RT Vol	0	118	1	0	72	0	0	32
Lane Flow Rate	16	133	384	243	253	165	5	35
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.041	0.289	0.794	0.506	0.501	0.402	0.012	0.073
Departure Headway (Hd)	9.076	7.849	7.45	7.485	7.121	8.76	8.244	7.521
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	393	456	483	480	504	410	433	474
Service Time	6.864	5.636	5.217	5.254	4.89	6.541	6.025	5.302
HCM Lane V/C Ratio	0.041	0.292	0.795	0.506	0.502	0.402	0.012	0.074
HCM Control Delay	12.3	13.8	33.4	17.7	16.9	17.4	11.1	10.9
HCM Lane LOS	B	B	D	C	C	C	B	B
HCM 95th-tile Q	0.1	1.2	7.3	2.8	2.8	1.9	0	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	152	5	32
Future Vol, veh/h	0	152	5	32
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	165	5	35
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	16.1
HCM LOS	C

Lane

4: SR 41 SB Ramps & Bush St

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	353	185	163	387	0	0	0	0	20	0	56
Future Vol, veh/h	0	353	185	163	387	0	0	0	0	20	0	56
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	384	201	177	421	0	0	0	0	22	0	61

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	421	0	0	585	0	0				1259	1360	210
Stage 1	-	-	-	-	-	-				775	775	-
Stage 2	-	-	-	-	-	-				484	585	-
Critical Hdwy	4.14	-	-	4.12	-	-				6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-				5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-				3.519	4.019	3.319
Pot Cap-1 Maneuver	1135	-	-	990	-	-				175	148	796
Stage 1	-	-	-	-	-	-				416	407	-
Stage 2	-	-	-	-	-	-				619	497	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1135	-	-	990	-	-				144	0	796
Mov Cap-2 Maneuver	-	-	-	-	-	-				144	0	-
Stage 1	-	-	-	-	-	-				342	0	-
Stage 2	-	-	-	-	-	-				619	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.8	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1135	-	-	990	-	-	144	796
HCM Lane V/C Ratio	-	-	-	0.179	-	-	0.151	0.076
HCM Control Delay (s)	0	-	-	9.4	-	-	34.4	9.9
HCM Lane LOS	A	-	-	A	-	-	D	A
HCM 95th %tile Q(veh)	0	-	-	0.7	-	-	0.5	0.2

Intersection	
Int Delay, s/veh	12.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	68	460	0	0	361	147	191	0	394	0	0	0
Future Vol, veh/h	68	460	0	0	361	147	191	0	394	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	74	500	0	0	392	160	208	0	428	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	552	0	0	500	0	0	844	1200	500
Stage 1	-	-	-	-	-	-	648	648	-
Stage 2	-	-	-	-	-	-	196	552	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	1014	-	-	1064	-	-	317	184	570
Stage 1	-	-	-	-	-	-	520	465	-
Stage 2	-	-	-	-	-	-	818	514	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1014	-	-	1064	-	-	294	0	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	294	0	-
Stage 1	-	-	-	-	-	-	482	0	-
Stage 2	-	-	-	-	-	-	818	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.1	0	32.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	294	570	1014	-	-	1064	-	-
HCM Lane V/C Ratio	0.706	0.751	0.073	-	-	-	-	-
HCM Control Delay (s)	42	27.9	8.8	-	-	0	-	-
HCM Lane LOS	E	D	A	-	-	A	-	-
HCM 95th %tile Q(veh)	4.9	6.6	0.2	-	-	0	-	-

6: S 19 1/2 Ave & Bush St

Intersection	
Intersection Delay, s/veh	26.7
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	322	310	171	0	28	219	25	0	152	108	36
Future Vol, veh/h	0	322	310	171	0	28	219	25	0	152	108	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	350	337	186	0	30	238	27	0	165	117	39
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	33.7	23.9	18.1
HCM LOS	D	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	152	108	36	322	310	171	28	219	25	27	71
LT Vol	152	0	0	322	0	0	28	0	0	27	0
Through Vol	0	108	0	0	310	0	0	219	0	0	71
RT Vol	0	0	36	0	0	171	0	0	25	0	0
Lane Flow Rate	165	117	39	350	337	186	30	238	27	29	77
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.454	0.307	0.095	0.846	0.767	0.387	0.084	0.623	0.066	0.081	0.203
Departure Headway (Hd)	9.903	9.403	8.703	8.697	8.197	7.497	9.925	9.425	8.725	9.949	9.449
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	363	383	412	417	441	480	361	383	410	360	380
Service Time	7.659	7.159	6.459	6.445	5.945	5.245	7.686	7.186	6.486	7.707	7.207
HCM Lane V/C Ratio	0.455	0.305	0.095	0.839	0.764	0.388	0.083	0.621	0.066	0.081	0.203
HCM Control Delay	20.7	16.3	12.4	44.1	33.3	14.9	13.6	26.6	12.1	13.6	14.6
HCM Lane LOS	C	C	B	E	D	B	B	D	B	B	B
HCM 95th-tile Q	2.3	1.3	0.3	8.1	6.5	1.8	0.3	4	0.2	0.3	0.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	27	71	200
Future Vol, veh/h	0	27	71	200
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	29	77	217
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	18.7
HCM LOS	C

Lane	SBLn3

Intersection	
Int Delay, s/veh	8.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	15	499	9	372	333	10	4	2	152	18	2	4
Future Vol, veh/h	15	499	9	372	333	10	4	2	152	18	2	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	150	400	-	150	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	542	10	404	362	11	4	2	165	20	2	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	362	0	0	542	0	0	1749	1746	542	1830	1746	362
Stage 1	-	-	-	-	-	-	575	575	-	1171	1171	-
Stage 2	-	-	-	-	-	-	1174	1171	-	659	575	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1197	-	-	1027	-	-	67	86	540	59	86	683
Stage 1	-	-	-	-	-	-	503	503	-	235	267	-
Stage 2	-	-	-	-	-	-	234	267	-	453	503	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1197	-	-	1027	-	-	44	51	540	27	51	683
Mov Cap-2 Maneuver	-	-	-	-	-	-	44	51	-	27	51	-
Stage 1	-	-	-	-	-	-	496	496	-	232	162	-
Stage 2	-	-	-	-	-	-	139	162	-	309	496	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	5.6	18.5	228.8
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	44	480	1197	-	-	1027	-	-	27	133
HCM Lane V/C Ratio	0.099	0.349	0.014	-	-	0.394	-	-	0.725	0.049
HCM Control Delay (s)	95.6	16.5	8	-	-	10.8	-	-	293.9	33.5
HCM Lane LOS	F	C	A	-	-	B	-	-	F	D
HCM 95th %tile Q(veh)	0.3	1.5	0	-	-	1.9	-	-	2.3	0.2

Intersection	
Int Delay, s/veh	288.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	18	510	15	43	702	95	37	8	244	169	11	33
Future Vol, veh/h	18	510	15	43	702	95	37	8	244	169	11	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	554	16	47	763	103	40	9	265	184	12	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	866	0	0	571	0	0	1534	1562	563	1647	1518	815
Stage 1	-	-	-	-	-	-	602	602	-	908	908	-
Stage 2	-	-	-	-	-	-	932	960	-	739	610	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	777	-	-	1002	-	-	95	112	526	~ 79	119	377
Stage 1	-	-	-	-	-	-	486	489	-	330	354	-
Stage 2	-	-	-	-	-	-	320	335	-	409	485	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	777	-	-	1002	-	-	71	98	526	~ 33	104	377
Mov Cap-2 Maneuver	-	-	-	-	-	-	71	98	-	~ 33	104	-
Stage 1	-	-	-	-	-	-	468	470	-	317	321	-
Stage 2	-	-	-	-	-	-	253	304	-	191	467	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	144.7	$ 2353.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	271	777	-	-	1002	-	-	40
HCM Lane V/C Ratio	1.159	0.025	-	-	0.047	-	-	5.788
HCM Control Delay (s)	144.7	9.8	0	-	8.8	0	-	$ 2353.4
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	13.9	0.1	-	-	0.1	-	-	27.1

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	28.5
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	11	377	3	0	63	365	72	0	18	4	118
Future Vol, veh/h	0	11	377	3	0	63	365	72	0	18	4	118
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	12	410	3	0	68	397	78	0	20	4	128
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	49.7	20.1	14.6
HCM LOS	E	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	3%	26%	0%	100%	0%	0%
Vol Thru, %	0%	3%	96%	74%	72%	0%	100%	0%
Vol Right, %	0%	97%	1%	0%	28%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	18	122	391	246	255	152	5	34
LT Vol	18	0	11	63	0	152	0	0
Through Vol	0	4	377	183	183	0	5	0
RT Vol	0	118	3	0	72	0	0	34
Lane Flow Rate	20	133	425	267	277	165	5	37
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.052	0.309	0.907	0.574	0.569	0.425	0.013	0.082
Departure Headway (Hd)	9.614	8.38	7.791	7.851	7.517	9.271	8.753	8.027
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	374	431	467	462	484	390	411	449
Service Time	7.324	6.09	5.491	5.551	5.217	6.979	6.461	5.735
HCM Lane V/C Ratio	0.053	0.309	0.91	0.578	0.572	0.423	0.012	0.082
HCM Control Delay	12.9	14.8	49.7	20.6	19.7	18.7	11.6	11.5
HCM Lane LOS	B	B	E	C	C	C	B	B
HCM 95th-tile Q	0.2	1.3	10.1	3.5	3.5	2.1	0	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	152	5	34
Future Vol, veh/h	0	152	5	34
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	165	5	37
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	17.2
HCM LOS	C

Lane

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	384	188	163	426	0	0	0	0	20	0	60
Future Vol, veh/h	0	384	188	163	426	0	0	0	0	20	0	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	417	204	177	463	0	0	0	0	22	0	65

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	463	0	0	622	0	0				1337	1439	232
Stage 1	-	-	-	-	-	-				817	817	-
Stage 2	-	-	-	-	-	-				520	622	-
Critical Hdwy	4.14	-	-	4.12	-	-				6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-				5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-				3.519	4.019	3.319
Pot Cap-1 Maneuver	1095	-	-	959	-	-				156	132	771
Stage 1	-	-	-	-	-	-				396	389	-
Stage 2	-	-	-	-	-	-				596	478	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1095	-	-	959	-	-				127	0	771
Mov Cap-2 Maneuver	-	-	-	-	-	-				127	0	-
Stage 1	-	-	-	-	-	-				323	0	-
Stage 2	-	-	-	-	-	-				596	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.7	17.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1095	-	-	959	-	-	127	771
HCM Lane V/C Ratio	-	-	-	0.185	-	-	0.171	0.085
HCM Control Delay (s)	0	-	-	9.6	-	-	39.1	10.1
HCM Lane LOS	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0	-	-	0.7	-	-	0.6	0.3

Intersection	
Int Delay, s/veh	13.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	73	486	0	0	393	147	195	0	394	0	0	0
Future Vol, veh/h	73	486	0	0	393	147	195	0	394	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	79	528	0	0	427	160	212	0	428	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	587	0	0	528	0	0	901	1274	528
Stage 1	-	-	-	-	-	-	687	687	-
Stage 2	-	-	-	-	-	-	214	587	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	984	-	-	1039	-	-	293	166	549
Stage 1	-	-	-	-	-	-	498	446	-
Stage 2	-	-	-	-	-	-	802	496	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	984	-	-	1039	-	-	269	0	549
Mov Cap-2 Maneuver	-	-	-	-	-	-	269	0	-
Stage 1	-	-	-	-	-	-	458	0	-
Stage 2	-	-	-	-	-	-	802	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.2	0	38.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	269	549	984	-	-	1039	-	-
HCM Lane V/C Ratio	0.788	0.78	0.081	-	-	-	-	-
HCM Control Delay (s)	54.5	31	9	-	-	0	-	-
HCM Lane LOS	F	D	A	-	-	A	-	-
HCM 95th %tile Q(veh)	6	7.2	0.3	-	-	0	-	-

Intersection	
Intersection Delay, s/veh	30.5
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	328	326	175	0	28	238	25	0	157	108	36
Future Vol, veh/h	0	328	326	175	0	28	238	25	0	157	108	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	357	354	190	0	30	259	27	0	171	117	39
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	39.2	28.3	19.1
HCM LOS	E	D	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	157	108	36	328	326	175	28	238	25	27	71
LT Vol	157	0	0	328	0	0	28	0	0	27	0
Through Vol	0	108	0	0	326	0	0	238	0	0	71
RT Vol	0	0	36	0	0	175	0	0	25	0	0
Lane Flow Rate	171	117	39	357	354	190	30	259	27	29	77
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.482	0.315	0.098	0.882	0.827	0.407	0.086	0.693	0.068	0.083	0.208
Departure Headway (Hd)	10.171	9.671	8.971	8.905	8.405	7.705	10.15	9.65	8.95	10.209	9.709
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	355	371	399	406	432	466	353	375	399	351	370
Service Time	7.939	7.439	6.739	6.661	6.161	5.461	7.919	7.419	6.719	7.977	7.477
HCM Lane V/C Ratio	0.482	0.315	0.098	0.879	0.819	0.408	0.085	0.691	0.068	0.083	0.208
HCM Control Delay	22.1	16.9	12.7	50.4	40.5	15.7	13.9	31.7	12.4	13.9	15
HCM Lane LOS	C	C	B	F	E	C	B	D	B	B	B
HCM 95th-tile Q	2.5	1.3	0.3	8.9	7.8	1.9	0.3	5	0.2	0.3	0.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	27	71	208
Future Vol, veh/h	0	27	71	208
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	29	77	226
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	20.3
HCM LOS	C

Lane	SBLn3

HCM 2010 Signalized Intersection Summary
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	18	510	15	43	702	95	37	8	244	169	11	33
Future Volume (veh/h)	18	510	15	43	702	95	37	8	244	169	11	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1750	1863	1750	1750	1863	1750	1750	1863	1750	1750	1863	1750
Adj Flow Rate, veh/h	20	554	16	47	763	103	40	9	265	184	12	36
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	931	26	74	824	109	94	44	505	353	27	57
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	27	1702	48	58	1505	199	135	122	1387	774	75	156
Grp Volume(v), veh/h	590	0	0	913	0	0	314	0	0	232	0	0
Grp Sat Flow(s),veh/h/ln	1777	0	0	1763	0	0	1644	0	0	1005	0	0
Q Serve(g_s), s	0.0	0.0	0.0	24.5	0.0	0.0	0.0	0.0	0.0	6.6	0.0	0.0
Cycle Q Clear(g_c), s	19.0	0.0	0.0	43.5	0.0	0.0	13.5	0.0	0.0	20.1	0.0	0.0
Prop In Lane	0.03		0.03	0.05		0.11	0.13		0.84	0.79		0.16
Lane Grp Cap(c), veh/h	1014	0	0	1006	0	0	643	0	0	437	0	0
V/C Ratio(X)	0.58	0.00	0.00	0.91	0.00	0.00	0.49	0.00	0.00	0.53	0.00	0.00
Avail Cap(c_a), veh/h	1067	0	0	1059	0	0	643	0	0	437	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.5	0.0	0.0	18.8	0.0	0.0	22.6	0.0	0.0	25.3	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.0	10.9	0.0	0.0	2.6	0.0	0.0	4.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	0.0	0.0	24.1	0.0	0.0	6.6	0.0	0.0	5.5	0.0	0.0
LnGrp Delay(d),s/veh	14.3	0.0	0.0	29.7	0.0	0.0	25.2	0.0	0.0	29.9	0.0	0.0
LnGrp LOS	B			C			C			C		
Approach Vol, veh/h		590			913			314			232	
Approach Delay, s/veh		14.3			29.7			25.2			29.9	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		36.8		53.2		36.8		53.2
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		30.0		52.0		30.0		52.0
Max Q Clear Time (g_c+I1), s		15.5		21.0		22.1		45.5
Green Ext Time (p_c), s		2.0		8.3		1.5		3.7

Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary

PM 2040+Project with MitigationÃ¯Â¿Â½

3: Belle Haven Dr & Bush St

12/22/2020

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			↰↑↱		↰	↑↱		↰	↑	↱
Traffic Volume (veh/h)	11	377	3	63	365	72	18	4	118	152	5	34
Future Volume (veh/h)	11	377	3	63	365	72	18	4	118	152	5	34
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1750	1863	1750	1750	1863	1750	1716	1863	1750	1716	1863	1716
Adj Flow Rate, veh/h	12	410	3	68	397	78	20	4	128	165	5	37
Adj No. of Lanes	0	1	0	0	2	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	47	505	4	122	627	122	869	30	974	770	1176	921
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	21	1805	13	255	2243	437	1252	48	1542	1154	1863	1458
Grp Volume(v), veh/h	425	0	0	254	0	289	20	0	132	165	5	37
Grp Sat Flow(s),veh/h/ln	1839	0	0	1316	0	1618	1252	0	1591	1154	1863	1458
Q Serve(g_s), s	4.5	0.0	0.0	0.0	0.0	14.1	0.5	0.0	3.0	6.0	0.1	0.9
Cycle Q Clear(g_c), s	19.4	0.0	0.0	15.5	0.0	14.1	0.6	0.0	3.0	9.0	0.1	0.9
Prop In Lane	0.03		0.01	0.27		0.27	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	555	0	0	419	0	453	869	0	1004	770	1176	921
V/C Ratio(X)	0.77	0.00	0.00	0.61	0.00	0.64	0.02	0.00	0.13	0.21	0.00	0.04
Avail Cap(c_a), veh/h	874	0	0	764	0	827	869	0	1004	770	1176	921
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.3	0.0	0.0	28.0	0.0	28.4	6.2	0.0	6.7	8.5	6.1	6.3
Incr Delay (d2), s/veh	2.2	0.0	0.0	1.4	0.0	1.5	0.0	0.0	0.3	0.6	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	0.0	0.0	5.8	0.0	6.5	0.2	0.0	1.4	2.1	0.0	0.4
LnGrp Delay(d),s/veh	32.5	0.0	0.0	29.4	0.0	29.9	6.3	0.0	6.9	9.1	6.1	6.4
LnGrp LOS	C			C		C	A		A	A	A	A
Approach Vol, veh/h		425			543			152			207	
Approach Delay, s/veh		32.5			29.7			6.9			8.6	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		60.8		29.2		60.8		29.2
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		36.0		46.0		36.0		46.0
Max Q Clear Time (g_c+I1), s		5.0		21.4		11.0		17.5
Green Ext Time (p_c), s		1.5		3.8		1.5		3.9

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱		↰	↑↑					↰	↑	↱
Traffic Volume (veh/h)	0	384	188	163	426	0	0	0	0	20	0	60
Future Volume (veh/h)	0	384	188	163	426	0	0	0	0	20	0	60
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1750	1716	1863	0				1716	1863	1716
Adj Flow Rate, veh/h	0	417	204	177	463	0				22	0	65
Adj No. of Lanes	0	1	0	1	2	0				1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	471	230	67	1698	0				717	817	640
Arrive On Green	0.00	0.40	0.40	0.04	0.48	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	1182	578	1634	3632	0				1634	1863	1458
Grp Volume(v), veh/h	0	0	621	177	463	0				22	0	65
Grp Sat Flow(s),veh/h/ln	0	0	1761	1634	1770	0				1634	1863	1458
Q Serve(g_s), s	0.0	0.0	32.1	4.0	7.7	0.0				0.8	0.0	2.6
Cycle Q Clear(g_c), s	0.0	0.0	32.1	4.0	7.7	0.0				0.8	0.0	2.6
Prop In Lane	0.00		0.33	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	0	701	67	1698	0				717	817	640
V/C Ratio(X)	0.00	0.00	0.89	2.65	0.27	0.00				0.03	0.00	0.10
Avail Cap(c_a), veh/h	0	0	1114	67	2239	0				717	817	640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	27.4	47.0	15.3	0.0				15.7	0.0	16.2
Incr Delay (d2), s/veh	0.0	0.0	5.5	785.3	0.1	0.0				0.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	16.6	16.3	3.7	0.0				0.4	0.0	1.1
LnGrp Delay(d),s/veh	0.0	0.0	32.9	832.3	15.3	0.0				15.7	0.0	16.5
LnGrp LOS			C	F	B					B		B
Approach Vol, veh/h		621			640						87	
Approach Delay, s/veh		32.9			241.3						16.3	
Approach LOS		C			F						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			8.0	43.0		47.0		51.0
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			4.0	62.0		20.0		62.0
Max Q Clear Time (g_c+I1), s			6.0	34.1		4.6		9.7
Green Ext Time (p_c), s			0.0	4.9		0.2		5.1

Intersection Summary	
HCM 2010 Ctrl Delay	130.8
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	328	326	175	28	238	25	157	108	36	27	71	208
Future Volume (veh/h)	328	326	175	28	238	25	157	108	36	27	71	208
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1716	1863	1716	1716	1863	1716	1716	1863	1716	1716	1863	1716
Adj Flow Rate, veh/h	357	354	190	30	259	27	171	117	39	29	77	226
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	488	912	714	373	912	714	471	785	615	512	785	615
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1003	1863	1458	791	1863	1458	987	1863	1458	1129	1863	1458
Grp Volume(v), veh/h	357	354	190	30	259	27	171	117	39	29	77	226
Grp Sat Flow(s),veh/h/ln	1003	1863	1458	791	1863	1458	987	1863	1458	1129	1863	1458
Q Serve(g_s), s	29.5	10.8	6.9	2.2	7.4	0.9	11.4	3.5	1.4	1.5	2.2	9.5
Cycle Q Clear(g_c), s	36.9	10.8	6.9	13.0	7.4	0.9	13.6	3.5	1.4	5.0	2.2	9.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	488	912	714	373	912	714	471	785	615	512	785	615
V/C Ratio(X)	0.73	0.39	0.27	0.08	0.28	0.04	0.36	0.15	0.06	0.06	0.10	0.37
Avail Cap(c_a), veh/h	621	1159	907	477	1159	907	471	785	615	512	785	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	14.5	13.5	18.6	13.6	11.9	19.8	16.1	15.5	17.6	15.7	17.8
Incr Delay (d2), s/veh	3.2	0.3	0.2	0.1	0.2	0.0	2.2	0.4	0.2	0.2	0.2	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	5.6	2.8	0.5	3.9	0.3	3.4	1.9	0.6	0.5	1.2	4.1
LnGrp Delay(d),s/veh	27.8	14.7	13.7	18.7	13.8	12.0	22.0	16.5	15.7	17.8	16.0	19.5
LnGrp LOS	C	B	B	B	B	B	C	B	B	B	B	B
Approach Vol, veh/h		901			316			327			332	
Approach Delay, s/veh		19.7			14.1			19.3			18.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		41.9		48.1		41.9		48.1
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		56.0		26.0		56.0
Max Q Clear Time (g_c+I1), s		15.6		38.9		11.5		15.0
Green Ext Time (p_c), s		2.1		5.2		2.5		6.2

Intersection Summary	
HCM 2010 Ctrl Delay	18.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	40	4	84	138	3	109
Future Vol, veh/h	40	4	84	138	3	109
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	400	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	4	91	150	3	118

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	43	0	376	43
Stage 1	-	-	-	-	43	-
Stage 2	-	-	-	-	333	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1566	-	625	1027
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1566	-	589	1027
Mov Cap-2 Maneuver	-	-	-	-	589	-
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	684	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1007	-	-	1566	-
HCM Lane V/C Ratio	0.121	-	-	0.058	-
HCM Control Delay (s)	9.1	-	-	7.4	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-

3: Belle Haven Dr & Bush St

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	14	191	3	0	20	466	45	0	5	0	39
Future Vol, veh/h	0	14	191	3	0	20	466	45	0	5	0	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	15	208	3	0	22	507	49	0	5	0	42
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	13.2	13.1	9.8
HCM LOS	B	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	7%	8%	0%	100%	0%	0%
Vol Thru, %	0%	0%	92%	92%	84%	0%	100%	0%
Vol Right, %	0%	100%	1%	0%	16%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	39	208	253	278	52	0	41
LT Vol	5	0	14	20	0	52	0	0
Through Vol	0	0	191	233	233	0	0	0
RT Vol	0	39	3	0	45	0	0	41
Lane Flow Rate	5	42	226	275	302	57	0	45
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.012	0.076	0.398	0.438	0.469	0.118	0	0.078
Departure Headway (Hd)	7.672	6.447	6.335	5.738	5.584	7.496	6.986	6.273
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	466	554	567	627	644	478	0	570
Service Time	5.428	4.202	4.079	3.474	3.32	5.249	4.739	4.025
HCM Lane V/C Ratio	0.011	0.076	0.399	0.439	0.469	0.119	0	0.079
HCM Control Delay	10.5	9.7	13.2	12.9	13.2	11.3	9.7	9.6
HCM Lane LOS	B	A	B	B	B	B	N	A
HCM 95th-tile Q	0	0.2	1.9	2.2	2.5	0.4	0	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	52	0	41
Future Vol, veh/h	0	52	0	41
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	57	0	45
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	10.6
HCM LOS	B

Lane

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	171	111	286	442	0	0	0	0	59	0	89
Future Vol, veh/h	0	171	111	286	442	0	0	0	0	59	0	89
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	186	121	311	480	0	0	0	0	64	0	97

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	480	0	0	307	0	0	1348	1409	240
Stage 1	-	-	-	-	-	-	1102	1102	-
Stage 2	-	-	-	-	-	-	246	307	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	1079	-	-	1254	-	-	154	138	762
Stage 1	-	-	-	-	-	-	281	286	-
Stage 2	-	-	-	-	-	-	794	660	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1079	-	-	1254	-	-	116	0	762
Mov Cap-2 Maneuver	-	-	-	-	-	-	116	0	-
Stage 1	-	-	-	-	-	-	211	0	-
Stage 2	-	-	-	-	-	-	794	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.5	33.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1079	-	-	1254	-	-	116	762
HCM Lane V/C Ratio	-	-	-	0.248	-	-	0.553	0.127
HCM Control Delay (s)	0	-	-	8.8	-	-	69	10.4
HCM Lane LOS	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0	-	-	1	-	-	2.6	0.4

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	32	198	0	0	564	158	164	0	82	0	0	0
Future Vol, veh/h	32	198	0	0	564	158	164	0	82	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	215	0	0	613	172	178	0	89	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	785	0	0	215	0	0	592	1070	215
Stage 1	-	-	-	-	-	-	285	285	-
Stage 2	-	-	-	-	-	-	307	785	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	829	-	-	1355	-	-	453	220	824
Stage 1	-	-	-	-	-	-	763	675	-
Stage 2	-	-	-	-	-	-	720	403	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	829	-	-	1355	-	-	434	0	824
Mov Cap-2 Maneuver	-	-	-	-	-	-	434	0	-
Stage 1	-	-	-	-	-	-	731	0	-
Stage 2	-	-	-	-	-	-	720	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.3	0	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	434	824	829	-	-	1355	-	-
HCM Lane V/C Ratio	0.411	0.108	0.042	-	-	-	-	-
HCM Control Delay (s)	19	9.9	9.5	-	-	0	-	-
HCM Lane LOS	C	A	A	-	-	A	-	-
HCM 95th %tile Q(veh)	2	0.4	0.1	-	-	0	-	-

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	95	118	67	0	22	234	22	0	190	53	19
Future Vol, veh/h	0	95	118	67	0	22	234	22	0	190	53	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	103	128	73	0	24	254	24	0	207	58	21
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	13	18.3	16.5
HCM LOS	B	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	190	53	19	95	118	67	22	234	22	32	59
LT Vol	190	0	0	95	0	0	22	0	0	32	0
Through Vol	0	53	0	0	118	0	0	234	0	0	59
RT Vol	0	0	19	0	0	67	0	0	22	0	0
Lane Flow Rate	207	58	21	103	128	73	24	254	24	35	64
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.476	0.125	0.041	0.239	0.279	0.144	0.055	0.55	0.047	0.078	0.135
Departure Headway (Hd)	8.29	7.79	7.09	8.324	7.824	7.124	8.288	7.788	7.088	8.058	7.558
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	434	459	504	431	458	502	431	463	504	444	474
Service Time	6.053	5.553	4.853	6.088	5.588	4.888	6.052	5.552	4.852	5.815	5.315
HCM Lane V/C Ratio	0.477	0.126	0.042	0.239	0.279	0.145	0.056	0.549	0.048	0.079	0.135
HCM Control Delay	18.4	11.7	10.2	13.7	13.6	11.1	11.5	19.7	10.2	11.5	11.5
HCM Lane LOS	C	B	B	B	B	B	B	C	B	B	B
HCM 95th-tile Q	2.5	0.4	0.1	0.9	1.1	0.5	0.2	3.3	0.1	0.3	0.5

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	32	59	298
Future Vol, veh/h	0	32	59	298
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	35	64	324
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	18.1
HCM LOS	C

Lane	SBLn3

Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	51	4	126	184	3	120
Future Vol, veh/h	51	4	126	184	3	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	150	400	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	4	137	200	3	130

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	55	0	529	55
Stage 1	-	-	-	-	55	-
Stage 2	-	-	-	-	474	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1550	-	510	1012
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	626	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1550	-	465	1012
Mov Cap-2 Maneuver	-	-	-	-	465	-
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	571	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	984	-	-	1550	-
HCM Lane V/C Ratio	0.136	-	-	0.088	-
HCM Control Delay (s)	9.2	-	-	7.5	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.3	-

Intersection	
Intersection Delay, s/veh	14.4
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	15	210	4	0	20	543	45	0	10	0	39
Future Vol, veh/h	0	15	210	4	0	20	543	45	0	10	0	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	16	228	4	0	22	590	49	0	11	0	42
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	14.7	15.1	10.3
HCM LOS	B	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	7%	7%	0%	100%	0%	0%
Vol Thru, %	0%	0%	92%	93%	86%	0%	100%	0%
Vol Right, %	0%	100%	2%	0%	14%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	39	229	292	317	52	0	45
LT Vol	10	0	15	20	0	52	0	0
Through Vol	0	0	210	272	272	0	0	0
RT Vol	0	39	4	0	45	0	0	45
Lane Flow Rate	11	42	249	317	344	57	0	49
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.024	0.08	0.454	0.517	0.549	0.123	0	0.09
Departure Headway (Hd)	7.997	6.768	6.569	5.877	5.742	7.818	7.307	6.592
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	446	527	548	612	626	457	0	541
Service Time	5.772	4.542	4.326	3.621	3.486	5.585	5.074	4.358
HCM Lane V/C Ratio	0.025	0.08	0.454	0.518	0.55	0.125	0	0.091
HCM Control Delay	11	10.1	14.7	14.8	15.3	11.7	10.1	10
HCM Lane LOS	B	B	B	B	C	B	N	A
HCM 95th-tile Q	0.1	0.3	2.3	3	3.3	0.4	0	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	52	0	45
Future Vol, veh/h	0	52	0	45
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	57	0	49
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	10.9
HCM LOS	B

Lane

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	188	113	286	512	0	0	0	0	59	0	96
Future Vol, veh/h	0	188	113	286	512	0	0	0	0	59	0	96
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	204	123	311	557	0	0	0	0	64	0	104

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	557	0	0	327	0	0				1444	1505	278
Stage 1	-	-	-	-	-	-				1178	1178	-
Stage 2	-	-	-	-	-	-				266	327	-
Critical Hdwy	4.14	-	-	4.12	-	-				6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-				5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-				3.519	4.019	3.319
Pot Cap-1 Maneuver	1010	-	-	1233	-	-				134	121	720
Stage 1	-	-	-	-	-	-				256	264	-
Stage 2	-	-	-	-	-	-				778	647	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1010	-	-	1233	-	-				100	0	720
Mov Cap-2 Maneuver	-	-	-	-	-	-				100	0	-
Stage 1	-	-	-	-	-	-				191	0	-
Stage 2	-	-	-	-	-	-				778	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.2	41.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1010	-	-	1233	-	-	100	720
HCM Lane V/C Ratio	-	-	-	0.252	-	-	0.641	0.145
HCM Control Delay (s)	0	-	-	8.9	-	-	90.3	10.8
HCM Lane LOS	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0	-	-	1	-	-	3.1	0.5

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	35	212	0	0	622	158	171	0	82	0	0	0
Future Vol, veh/h	35	212	0	0	622	158	171	0	82	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	230	0	0	676	172	186	0	89	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	848	0	0	230	0	0	645	1155	230
Stage 1	-	-	-	-	-	-	307	307	-
Stage 2	-	-	-	-	-	-	338	848	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	785	-	-	1338	-	-	420	196	808
Stage 1	-	-	-	-	-	-	745	660	-
Stage 2	-	-	-	-	-	-	695	377	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	785	-	-	1338	-	-	400	0	808
Mov Cap-2 Maneuver	-	-	-	-	-	-	400	0	-
Stage 1	-	-	-	-	-	-	709	0	-
Stage 2	-	-	-	-	-	-	695	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.4	0	17.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	400	808	785	-	-	1338	-	-
HCM Lane V/C Ratio	0.465	0.11	0.048	-	-	-	-	-
HCM Control Delay (s)	21.6	10	9.8	-	-	0	-	-
HCM Lane LOS	C	B	A	-	-	A	-	-
HCM 95th %tile Q(veh)	2.4	0.4	0.2	-	-	0	-	-

Intersection	
Intersection Delay, s/veh	19
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	98	127	69	0	22	268	22	0	199	53	19
Future Vol, veh/h	0	98	127	69	0	22	268	22	0	199	53	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	107	138	75	0	24	291	24	0	216	58	21
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	13.7	22.6	18
HCM LOS	B	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	199	53	19	98	127	69	22	268	22	32	59
LT Vol	199	0	0	98	0	0	22	0	0	32	0
Through Vol	0	53	0	0	127	0	0	268	0	0	59
RT Vol	0	0	19	0	0	69	0	0	22	0	0
Lane Flow Rate	216	58	21	107	138	75	24	291	24	35	64
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.516	0.13	0.042	0.255	0.311	0.154	0.056	0.648	0.049	0.081	0.14
Departure Headway (Hd)	8.594	8.094	7.394	8.607	8.107	7.407	8.503	8.003	7.303	8.34	7.84
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	417	441	482	415	442	482	420	449	488	428	456
Service Time	6.377	5.877	5.177	6.39	5.89	5.19	6.282	5.782	5.082	6.115	5.615
HCM Lane V/C Ratio	0.518	0.132	0.044	0.258	0.312	0.156	0.057	0.648	0.049	0.082	0.14
HCM Control Delay	20.3	12.1	10.5	14.3	14.5	11.5	11.8	24.5	10.5	11.9	11.9
HCM Lane LOS	C	B	B	B	B	B	B	C	B	B	B
HCM 95th-tile Q	2.9	0.4	0.1	1	1.3	0.5	0.2	4.5	0.2	0.3	0.5

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	32	59	312
Future Vol, veh/h	0	32	59	312
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	35	64	339
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	20.9
HCM LOS	C

Lane	SBLn3

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	50	5	88	145	3	3	0	113	7	0	1
Future Vol, veh/h	0	50	5	88	145	3	3	0	113	7	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	150	400	-	150	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	54	5	96	158	3	3	0	123	8	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	158	0	0	54	0	0	403	403	54	465	403	158
Stage 1	-	-	-	-	-	-	54	54	-	349	349	-
Stage 2	-	-	-	-	-	-	349	349	-	116	54	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1422	-	-	1551	-	-	558	536	1013	508	536	887
Stage 1	-	-	-	-	-	-	958	850	-	667	633	-
Stage 2	-	-	-	-	-	-	667	633	-	889	850	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1422	-	-	1551	-	-	531	503	1013	425	503	887
Mov Cap-2 Maneuver	-	-	-	-	-	-	531	503	-	425	503	-
Stage 1	-	-	-	-	-	-	958	850	-	667	594	-
Stage 2	-	-	-	-	-	-	625	594	-	781	850	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.8	9.1	13
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	531	1013	1422	-	-	1551	-	-	425	887
HCM Lane V/C Ratio	0.006	0.121	-	-	-	0.062	-	-	0.018	0.001
HCM Control Delay (s)	11.8	9	0	-	-	7.5	-	-	13.6	9.1
HCM Lane LOS	B	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0	0.4	0	-	-	0.2	-	-	0.1	0

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	3	238	17	43	541	7	19	0	103	4	0	7
Future Vol, veh/h	3	238	17	43	541	7	19	0	103	4	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	259	18	47	588	8	21	0	112	4	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	596	0	0	277	0	0	963	963	268	1015	969	592
Stage 1	-	-	-	-	-	-	274	274	-	685	685	-
Stage 2	-	-	-	-	-	-	689	689	-	330	284	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	980	-	-	1286	-	-	235	256	771	217	254	506
Stage 1	-	-	-	-	-	-	732	683	-	438	448	-
Stage 2	-	-	-	-	-	-	436	446	-	683	676	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	980	-	-	1286	-	-	221	241	771	177	239	506
Mov Cap-2 Maneuver	-	-	-	-	-	-	221	241	-	177	239	-
Stage 1	-	-	-	-	-	-	729	680	-	436	423	-
Stage 2	-	-	-	-	-	-	406	421	-	581	673	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.6	13.5	17.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	556	980	-	-	1286	-	-	302
HCM Lane V/C Ratio	0.239	0.003	-	-	0.036	-	-	0.04
HCM Control Delay (s)	13.5	8.7	0	-	7.9	0	-	17.4
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	0.1

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	15	203	3	0	22	510	49	0	7	0	51
Future Vol, veh/h	0	15	203	3	0	22	510	49	0	7	0	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	16	221	3	0	24	554	53	0	8	0	55
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	14.6	14.8	10.4
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	7%	8%	0%	100%	0%	0%
Vol Thru, %	0%	0%	92%	92%	84%	0%	100%	0%
Vol Right, %	0%	100%	1%	0%	16%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	51	221	277	304	63	0	50
LT Vol	7	0	15	22	0	63	0	0
Through Vol	0	0	203	255	255	0	0	0
RT Vol	0	51	3	0	49	0	0	50
Lane Flow Rate	8	55	240	301	330	68	0	54
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.017	0.104	0.443	0.499	0.533	0.148	0	0.099
Departure Headway (Hd)	7.984	6.756	6.633	5.962	5.808	7.78	7.269	6.554
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	446	528	540	602	621	459	0	544
Service Time	5.765	4.535	4.395	3.711	3.557	5.553	5.042	4.326
HCM Lane V/C Ratio	0.018	0.104	0.444	0.5	0.531	0.148	0	0.099
HCM Control Delay	10.9	10.3	14.6	14.5	15	11.9	10	10.1
HCM Lane LOS	B	B	B	B	B	B	N	B
HCM 95th-tile Q	0.1	0.3	2.3	2.8	3.1	0.5	0	0.3

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	63	0	50
Future Vol, veh/h	0	63	0	50
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	68	0	54
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11.1
HCM LOS	B

Lane

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	187	121	312	482	0	0	0	0	62	0	94
Future Vol, veh/h	0	187	121	312	482	0	0	0	0	62	0	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	203	132	339	524	0	0	0	0	67	0	102

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	524	0	0	335	0	0	1471	1537	262
Stage 1	-	-	-	-	-	-	1202	1202	-
Stage 2	-	-	-	-	-	-	269	335	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	1039	-	-	1224	-	-	128	115	737
Stage 1	-	-	-	-	-	-	248	257	-
Stage 2	-	-	-	-	-	-	775	642	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	1039	-	-	1224	-	-	93	0	737
Mov Cap-2 Maneuver	-	-	-	-	-	-	93	0	-
Stage 1	-	-	-	-	-	-	179	0	-
Stage 2	-	-	-	-	-	-	775	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.6	50.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1039	-	-	1224	-	-	93	737
HCM Lane V/C Ratio	-	-	-	0.277	-	-	0.725	0.139
HCM Control Delay (s)	0	-	-	9.1	-	-	110.1	10.7
HCM Lane LOS	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0	-	-	1.1	-	-	3.7	0.5

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	35	216	0	0	612	171	182	0	91	0	0	0
Future Vol, veh/h	35	216	0	0	612	171	182	0	91	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	235	0	0	665	186	198	0	99	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	851	0	0	235	0	0	644	1162	235
Stage 1	-	-	-	-	-	-	311	311	-
Stage 2	-	-	-	-	-	-	333	851	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	783	-	-	1332	-	-	421	194	803
Stage 1	-	-	-	-	-	-	742	658	-
Stage 2	-	-	-	-	-	-	699	375	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	783	-	-	1332	-	-	401	0	803
Mov Cap-2 Maneuver	-	-	-	-	-	-	401	0	-
Stage 1	-	-	-	-	-	-	706	0	-
Stage 2	-	-	-	-	-	-	699	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.4	0	18.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	401	803	783	-	-	1332	-	-
HCM Lane V/C Ratio	0.493	0.123	0.049	-	-	-	-	-
HCM Control Delay (s)	22.4	10.1	9.8	-	-	0	-	-
HCM Lane LOS	C	B	A	-	-	A	-	-
HCM 95th %tile Q(veh)	2.6	0.4	0.2	-	-	0	-	-

6: S 19 1/2 Ave & Bush St

Intersection	
Intersection Delay, s/veh	20.5
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	103	128	73	0	24	256	24	0	216	60	22
Future Vol, veh/h	0	103	128	73	0	24	256	24	0	216	60	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	112	139	79	0	26	278	26	0	235	65	24
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	14.3	22.6	19.7
HCM LOS	B	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	216	60	22	103	128	73	24	256	24	36	66
LT Vol	216	0	0	103	0	0	24	0	0	36	0
Through Vol	0	60	0	0	128	0	0	256	0	0	66
RT Vol	0	0	22	0	0	73	0	0	24	0	0
Lane Flow Rate	235	65	24	112	139	79	26	278	26	39	72
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.57	0.149	0.05	0.274	0.322	0.168	0.064	0.639	0.055	0.092	0.159
Departure Headway (Hd)	8.746	8.246	7.546	8.826	8.326	7.626	8.771	8.271	7.571	8.491	7.991
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	411	432	472	405	430	467	407	434	470	421	447
Service Time	6.539	6.039	5.339	6.618	6.118	5.418	6.56	6.06	5.36	6.274	5.774
HCM Lane V/C Ratio	0.572	0.15	0.051	0.277	0.323	0.169	0.064	0.641	0.055	0.093	0.161
HCM Control Delay	22.6	12.5	10.7	14.9	15.1	12	12.2	24.7	10.8	12.1	12.3
HCM Lane LOS	C	B	B	B	C	B	B	C	B	B	B
HCM 95th-tile Q	3.4	0.5	0.2	1.1	1.4	0.6	0.2	4.3	0.2	0.3	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	36	66	331
Future Vol, veh/h	0	36	66	331
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	39	72	360
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	23.8
HCM LOS	C

Lane	SBLn3

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	61	5	130	191	3	3	0	124	7	0	1
Future Vol, veh/h	0	61	5	130	191	3	3	0	124	7	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	150	400	-	150	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	66	5	141	208	3	3	0	135	8	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	208	0	0	66	0	0	557	556	66	624	556	208
Stage 1	-	-	-	-	-	-	66	66	-	490	490	-
Stage 2	-	-	-	-	-	-	491	490	-	134	66	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1363	-	-	1536	-	-	441	439	998	398	439	832
Stage 1	-	-	-	-	-	-	945	840	-	560	549	-
Stage 2	-	-	-	-	-	-	559	549	-	869	840	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1363	-	-	1536	-	-	409	399	998	320	399	832
Mov Cap-2 Maneuver	-	-	-	-	-	-	409	399	-	320	399	-
Stage 1	-	-	-	-	-	-	945	840	-	560	499	-
Stage 2	-	-	-	-	-	-	507	499	-	752	840	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3	9.3	15.6
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	409	998	1363	-	-	1536	-	-	320	832
HCM Lane V/C Ratio	0.008	0.135	-	-	-	0.092	-	-	0.024	0.001
HCM Control Delay (s)	13.9	9.2	0	-	-	7.6	-	-	16.5	9.3
HCM Lane LOS	B	A	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	0	0.5	0	-	-	0.3	-	-	0.1	0

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	3	259	17	43	627	7	19	0	103	4	0	7
Future Vol, veh/h	3	259	17	43	627	7	19	0	103	4	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	282	18	47	682	8	21	0	112	4	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	689	0	0	300	0	0	1080	1080	291	1132	1086	685
Stage 1	-	-	-	-	-	-	297	297	-	779	779	-
Stage 2	-	-	-	-	-	-	783	783	-	353	307	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	905	-	-	1261	-	-	196	218	748	180	216	448
Stage 1	-	-	-	-	-	-	712	668	-	389	406	-
Stage 2	-	-	-	-	-	-	387	404	-	664	661	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	905	-	-	1261	-	-	183	204	748	146	202	448
Mov Cap-2 Maneuver	-	-	-	-	-	-	183	204	-	146	202	-
Stage 1	-	-	-	-	-	-	709	665	-	387	382	-
Stage 2	-	-	-	-	-	-	358	380	-	562	658	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	14.6	19.8
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	505	905	-	-	1261	-	-	256
HCM Lane V/C Ratio	0.263	0.004	-	-	0.037	-	-	0.047
HCM Control Delay (s)	14.6	9	0	-	8	0	-	19.8
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1	0	-	-	0.1	-	-	0.1

3: Belle Haven Dr & Bush St

Intersection	
Intersection Delay, s/veh	16.3
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	16	222	4	0	22	587	49	0	12	0	51
Future Vol, veh/h	0	16	222	4	0	22	587	49	0	12	0	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	17	241	4	0	24	638	53	0	13	0	55
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	16.5	17.6	10.9
HCM LOS	C	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	7%	7%	0%	100%	0%	0%
Vol Thru, %	0%	0%	92%	93%	86%	0%	100%	0%
Vol Right, %	0%	100%	2%	0%	14%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	51	242	316	343	63	0	54
LT Vol	12	0	16	22	0	63	0	0
Through Vol	0	0	222	294	294	0	0	0
RT Vol	0	51	4	0	49	0	0	54
Lane Flow Rate	13	55	263	343	372	68	0	59
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.03	0.109	0.502	0.582	0.618	0.154	0	0.112
Departure Headway (Hd)	8.317	7.085	6.876	6.111	5.975	8.105	7.593	6.876
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	428	502	521	590	603	440	0	518
Service Time	6.115	4.882	4.651	3.871	3.735	5.895	5.382	4.664
HCM Lane V/C Ratio	0.03	0.11	0.505	0.581	0.617	0.155	0	0.114
HCM Control Delay	11.4	10.8	16.5	17.1	18	12.4	10.4	10.5
HCM Lane LOS	B	B	C	C	C	B	N	B
HCM 95th-tile Q	0.1	0.4	2.8	3.7	4.2	0.5	0	0.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	63	0	54
Future Vol, veh/h	0	63	0	54
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	68	0	59
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11.5
HCM LOS	B

Lane

HCM 2010 TWSC
4: SR 41 SB Ramps & Bush St

AM 2024+Project
12/22/2020

Intersection	
Int Delay, s/veh	9.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	204	123	312	552	0	0	0	0	62	0	101
Future Vol, veh/h	0	204	123	312	552	0	0	0	0	62	0	101
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	222	134	339	600	0	0	0	0	67	0	110

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	600	0	0	355	0	0	1567	1633	300
Stage 1	-	-	-	-	-	-	1278	1278	-
Stage 2	-	-	-	-	-	-	289	355	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	973	-	-	1204	-	-	112	101	697
Stage 1	-	-	-	-	-	-	226	236	-
Stage 2	-	-	-	-	-	-	759	629	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	973	-	-	1204	-	-	80	0	697
Mov Cap-2 Maneuver	-	-	-	-	-	-	80	0	-
Stage 1	-	-	-	-	-	-	162	0	-
Stage 2	-	-	-	-	-	-	759	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.3	63.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	973	-	-	1204	-	-	80	697
HCM Lane V/C Ratio	-	-	-	0.282	-	-	0.842	0.158
HCM Control Delay (s)	0	-	-	9.2	-	-	149.9	11.1
HCM Lane LOS	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0	-	-	1.2	-	-	4.3	0.6

5: SR 41 NB Ramps & Bush St

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	38	230	0	0	670	171	189	0	91	0	0	0
Future Vol, veh/h	38	230	0	0	670	171	189	0	91	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	250	0	0	728	186	205	0	99	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	914	0	0	250	0	0	697	1247	250
Stage 1	-	-	-	-	-	-	333	333	-
Stage 2	-	-	-	-	-	-	364	914	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	742	-	-	1316	-	-	391	173	788
Stage 1	-	-	-	-	-	-	725	643	-
Stage 2	-	-	-	-	-	-	674	351	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	742	-	-	1316	-	-	369	0	788
Mov Cap-2 Maneuver	-	-	-	-	-	-	369	0	-
Stage 1	-	-	-	-	-	-	685	0	-
Stage 2	-	-	-	-	-	-	674	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.4	0	21.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	369	788	742	-	-	1316	-	-
HCM Lane V/C Ratio	0.557	0.126	0.056	-	-	-	-	-
HCM Control Delay (s)	26.3	10.2	10.1	-	-	0	-	-
HCM Lane LOS	D	B	B	-	-	A	-	-
HCM 95th %tile Q(veh)	3.3	0.4	0.2	-	-	0	-	-

Intersection	
Intersection Delay, s/veh	25.1
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	106	137	75	0	24	290	24	0	225	60	22
Future Vol, veh/h	0	106	137	75	0	24	290	24	0	225	60	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	115	149	82	0	26	315	26	0	245	65	24
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	15.3	30.4	22.5
HCM LOS	C	D	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	225	60	22	106	137	75	24	290	24	36	66
LT Vol	225	0	0	106	0	0	24	0	0	36	0
Through Vol	0	60	0	0	137	0	0	290	0	0	66
RT Vol	0	0	22	0	0	75	0	0	24	0	0
Lane Flow Rate	245	65	24	115	149	82	26	315	26	39	72
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.624	0.157	0.053	0.296	0.362	0.182	0.066	0.754	0.057	0.097	0.167
Departure Headway (Hd)	9.191	8.691	7.991	9.254	8.754	8.054	9.116	8.616	7.916	8.902	8.402
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	394	413	448	388	411	446	393	419	453	403	428
Service Time	6.938	6.438	5.738	7.001	6.501	5.801	6.862	6.362	5.662	6.644	6.144
HCM Lane V/C Ratio	0.622	0.157	0.054	0.296	0.363	0.184	0.066	0.752	0.057	0.097	0.168
HCM Control Delay	26.1	13.1	11.2	15.9	16.4	12.6	12.5	33.5	11.1	12.6	12.8
HCM Lane LOS	D	B	B	C	C	B	B	D	B	B	B
HCM 95th-tile Q	4.1	0.6	0.2	1.2	1.6	0.7	0.2	6.2	0.2	0.3	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	36	66	345
Future Vol, veh/h	0	36	66	345
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	39	72	375
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	29.9
HCM LOS	D

Lane	SBLn3

1: College Ave & Bush St

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	2	124	12	108	177	10	3	0	117	21	1	6
Future Vol, veh/h	2	124	12	108	177	10	3	0	117	21	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	150	400	-	150	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	135	13	117	192	11	3	0	127	23	1	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	192	0	0	135	0	0	570	566	135	630	566	192
Stage 1	-	-	-	-	-	-	139	139	-	427	427	-
Stage 2	-	-	-	-	-	-	431	427	-	203	139	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1381	-	-	1449	-	-	432	434	914	394	434	850
Stage 1	-	-	-	-	-	-	864	782	-	606	585	-
Stage 2	-	-	-	-	-	-	603	585	-	799	782	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1381	-	-	1449	-	-	401	398	914	318	398	850
Mov Cap-2 Maneuver	-	-	-	-	-	-	401	398	-	318	398	-
Stage 1	-	-	-	-	-	-	863	781	-	605	538	-
Stage 2	-	-	-	-	-	-	549	538	-	687	781	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.8	9.7	15.4
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	401	914	1381	-	-	1449	-	-	318	731
HCM Lane V/C Ratio	0.008	0.139	0.002	-	-	0.081	-	-	0.072	0.01
HCM Control Delay (s)	14.1	9.6	7.6	-	-	7.7	-	-	17.2	10
HCM Lane LOS	B	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0.5	0	-	-	0.3	-	-	0.2	0

HCM 2010 TWSC
2: Semas Dr & Bush St

AM 2040
12/22/2020

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	3	411	17	43	657	7	19	0	103	4	0	7
Future Vol, veh/h	3	411	17	43	657	7	19	0	103	4	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	447	18	47	714	8	21	0	112	4	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	722	0	0	465	0	0	1278	1278	456	1329	1283	718
Stage 1	-	-	-	-	-	-	463	463	-	811	811	-
Stage 2	-	-	-	-	-	-	815	815	-	518	472	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	880	-	-	1096	-	-	143	166	604	132	165	429
Stage 1	-	-	-	-	-	-	579	564	-	373	393	-
Stage 2	-	-	-	-	-	-	371	391	-	541	559	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	880	-	-	1096	-	-	132	153	604	101	152	429
Mov Cap-2 Maneuver	-	-	-	-	-	-	132	153	-	101	152	-
Stage 1	-	-	-	-	-	-	576	561	-	371	365	-
Stage 2	-	-	-	-	-	-	338	363	-	439	556	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	19	24.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	388	880	-	-	1096	-	-	197
HCM Lane V/C Ratio	0.342	0.004	-	-	0.043	-	-	0.061
HCM Control Delay (s)	19	9.1	0	-	8.4	0	-	24.5
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.5	0	-	-	0.1	-	-	0.2

HCM 2010 AWSC
3: Belle Haven Dr & Bush St

AM 2040
12/22/2020

Intersection	
Intersection Delay, s/veh	46.5
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	19	256	4	0	31	729	70	0	19	0	148
Future Vol, veh/h	0	19	256	4	0	31	729	70	0	19	0	148
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	21	278	4	0	34	792	76	0	21	0	161
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	34.7	65.1	17
HCM LOS	D	F	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	7%	8%	0%	100%	0%	0%
Vol Thru, %	0%	0%	92%	92%	84%	0%	100%	0%
Vol Right, %	0%	100%	1%	0%	16%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	19	148	279	396	435	138	0	109
LT Vol	19	0	19	31	0	138	0	0
Through Vol	0	0	256	365	365	0	0	0
RT Vol	0	148	4	0	70	0	0	109
Lane Flow Rate	21	161	303	430	472	150	0	118
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.058	0.402	0.757	0.954	1	0.412	0	0.284
Departure Headway (Hd)	10.14	8.993	8.981	7.992	7.836	9.883	9.364	8.637
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	355	405	406	456	468	369	0	421
Service Time	7.85	6.651	6.665	5.69	5.534	7.498	6.999	6.3
HCM Lane V/C Ratio	0.059	0.398	0.746	0.943	1.009	0.407	0	0.28
HCM Control Delay	13.5	17.5	34.7	59.8	69.9	19.2	12	14.7
HCM Lane LOS	B	C	D	F	F	C	N	B
HCM 95th-tile Q	0.2	1.9	6.2	11.5	13.1	2	0	1.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	138	0	109
Future Vol, veh/h	0	138	0	109
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	150	0	118
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	17.2
HCM LOS	C

Lane

Intersection	
Int Delay, s/veh	58.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	267	174	443	684	0	0	0	0	79	0	119
Future Vol, veh/h	0	267	174	443	684	0	0	0	0	79	0	119
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	290	189	482	743	0	0	0	0	86	0	129

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	743	0	0	479	0	0				2092	2186	372
Stage 1	-	-	-	-	-	-				1707	1707	-
Stage 2	-	-	-	-	-	-				385	479	-
Critical Hdwy	4.14	-	-	4.12	-	-				6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-				5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-				3.519	4.019	3.319
Pot Cap-1 Maneuver	860	-	-	1083	-	-				~ 51	45	626
Stage 1	-	-	-	-	-	-				133	146	-
Stage 2	-	-	-	-	-	-				687	554	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	860	-	-	1083	-	-				~ 28	0	626
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 28	0	-
Stage 1	-	-	-	-	-	-				~ 74	0	-
Stage 2	-	-	-	-	-	-				687	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.3	$ 496.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	860	-	-	1083	-	-	28	626
HCM Lane V/C Ratio	-	-	-	0.445	-	-	3.067	0.207
HCM Control Delay (s)	0	-	-	11	-	$	1226	12.2
HCM Lane LOS	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0	-	-	2.3	-	-	10.3	0.8

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

5: SR 41 NB Ramps & Bush St

12/22/2020

Intersection	
Int Delay, s/veh	20.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	50	307	0	0	848	238	273	0	136	0	0	0
Future Vol, veh/h	50	307	0	0	848	238	273	0	136	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	334	0	0	922	259	297	0	148	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1180	0	0	334	0	0	903	1622	334
Stage 1	-	-	-	-	-	-	442	442	-
Stage 2	-	-	-	-	-	-	461	1180	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	588	-	-	1225	-	-	~ 292	102	707
Stage 1	-	-	-	-	-	-	647	576	-
Stage 2	-	-	-	-	-	-	602	263	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	588	-	-	1225	-	-	~ 265	0	707
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 265	0	-
Stage 1	-	-	-	-	-	-	588	0	-
Stage 2	-	-	-	-	-	-	602	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.6	0	92.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	265	707	588	-	-	1225	-	-
HCM Lane V/C Ratio	1.12	0.209	0.092	-	-	-	-	-
HCM Control Delay (s)	132.5	11.4	11.7	-	-	0	-	-
HCM Lane LOS	F	B	B	-	-	A	-	-
HCM 95th %tile Q(veh)	12.7	0.8	0.3	-	-	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	57.9
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	143	177	101	0	34	366	34	0	360	100	36
Future Vol, veh/h	0	143	177	101	0	34	366	34	0	360	100	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	155	192	110	0	37	398	37	0	391	109	39
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	24	72.1	65.6
HCM LOS	C	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	360	100	36	143	177	101	34	366	34	54	100
LT Vol	360	0	0	143	0	0	34	0	0	54	0
Through Vol	0	100	0	0	177	0	0	366	0	0	100
RT Vol	0	0	36	0	0	101	0	0	34	0	0
Lane Flow Rate	391	109	39	155	192	110	37	398	37	59	109
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	1	0.316	0.107	0.488	0.578	0.309	0.114	1	0.102	0.178	0.315
Departure Headway (Hd)	10.965	10.479	9.798	11.306	10.816	10.129	11.144	10.657	9.977	10.904	10.418
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	333	345	367	320	335	356	323	342	360	330	346
Service Time	8.696	8.21	7.53	9.031	8.541	7.854	8.88	8.394	7.713	8.635	8.149
HCM Lane V/C Ratio	1.174	0.316	0.106	0.484	0.573	0.309	0.115	1.164	0.103	0.179	0.315
HCM Control Delay	84	18	13.7	24.4	27.4	17.3	15.3	82.8	13.8	16	17.9
HCM Lane LOS	F	C	B	C	D	C	C	F	B	C	C
HCM 95th-tile Q	11.1	1.3	0.4	2.5	3.4	1.3	0.4	11.2	0.3	0.6	1.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	54	100	506
Future Vol, veh/h	0	54	100	506
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	59	109	550
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	64.4
HCM LOS	F

Lane	SBLn3

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	2	135	12	150	223	10	3	0	128	21	1	6
Future Vol, veh/h	2	135	12	150	223	10	3	0	128	21	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	150	400	-	150	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	147	13	163	242	11	3	0	139	23	1	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	242	0	0	147	0	0	723	719	147	789	719	242
Stage 1	-	-	-	-	-	-	151	151	-	568	568	-
Stage 2	-	-	-	-	-	-	572	568	-	221	151	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1324	-	-	1435	-	-	342	354	900	308	354	797
Stage 1	-	-	-	-	-	-	851	772	-	508	506	-
Stage 2	-	-	-	-	-	-	505	506	-	781	772	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1324	-	-	1435	-	-	309	313	900	237	313	797
Mov Cap-2 Maneuver	-	-	-	-	-	-	309	313	-	237	313	-
Stage 1	-	-	-	-	-	-	850	771	-	507	449	-
Stage 2	-	-	-	-	-	-	443	449	-	659	771	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.1	9.9	19
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	309	900	1324	-	-	1435	-	-	237	653
HCM Lane V/C Ratio	0.011	0.155	0.002	-	-	0.114	-	-	0.096	0.012
HCM Control Delay (s)	16.8	9.7	7.7	-	-	7.8	-	-	21.8	10.6
HCM Lane LOS	C	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0.5	0	-	-	0.4	-	-	0.3	0

2: Semas Dr & Bush St

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	3	432	17	43	743	7	19	0	103	4	0	7
Future Vol, veh/h	3	432	17	43	743	7	19	0	103	4	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	470	18	47	808	8	21	0	112	4	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	815	0	0	488	0	0	1394	1394	479	1446	1400	811
Stage 1	-	-	-	-	-	-	485	485	-	905	905	-
Stage 2	-	-	-	-	-	-	909	909	-	541	495	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	812	-	-	1075	-	-	119	141	587	109	140	379
Stage 1	-	-	-	-	-	-	563	552	-	331	355	-
Stage 2	-	-	-	-	-	-	329	354	-	525	546	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	812	-	-	1075	-	-	109	129	587	83	128	379
Mov Cap-2 Maneuver	-	-	-	-	-	-	109	129	-	83	128	-
Stage 1	-	-	-	-	-	-	560	549	-	329	327	-
Stage 2	-	-	-	-	-	-	297	326	-	423	543	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	21.5	28.5
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	349	812	-	-	1075	-	-	165
HCM Lane V/C Ratio	0.38	0.004	-	-	0.043	-	-	0.072
HCM Control Delay (s)	21.5	9.5	0	-	8.5	0	-	28.5
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	1.7	0	-	-	0.1	-	-	0.2

Intersection	
Intersection Delay, s/veh	51.6
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	20	275	5	0	31	806	70	0	24	0	148
Future Vol, veh/h	0	20	275	5	0	31	806	70	0	24	0	148
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	22	299	5	0	34	876	76	0	26	0	161
Number of Lanes	0	0	1	0	0	0	2	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	41.3	71	17.3
HCM LOS	E	F	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	7%	7%	0%	100%	0%	0%
Vol Thru, %	0%	0%	92%	93%	85%	0%	100%	0%
Vol Right, %	0%	100%	2%	0%	15%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	148	300	434	473	138	0	113
LT Vol	24	0	20	31	0	138	0	0
Through Vol	0	0	275	403	403	0	0	0
RT Vol	0	148	5	0	70	0	0	113
Lane Flow Rate	26	161	326	472	514	150	0	123
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.074	0.405	0.816	1	1	0.414	0	0.298
Departure Headway (Hd)	10.268	9.068	9.007	8.066	7.923	9.925	9.425	8.725
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	349	397	401	448	458	363	0	411
Service Time	8.027	6.828	6.757	5.844	5.701	7.678	7.178	6.479
HCM Lane V/C Ratio	0.074	0.406	0.813	1.054	1.122	0.413	0	0.299
HCM Control Delay	13.9	17.9	41.3	71.4	70.7	19.5	12.2	15.2
HCM Lane LOS	B	C	E	F	F	C	N	C
HCM 95th-tile Q	0.2	1.9	7.4	12.9	13	2	0	1.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	138	0	113
Future Vol, veh/h	0	138	0	113
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	150	0	123
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	17.6
HCM LOS	C

Lane

Intersection	
Int Delay, s/veh	67

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	284	176	443	754	0	0	0	0	79	0	126
Future Vol, veh/h	0	284	176	443	754	0	0	0	0	79	0	126
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	0	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	309	191	482	820	0	0	0	0	86	0	137

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	820	0	0	500	0	0				2187	2283	410
Stage 1	-	-	-	-	-	-				1783	1783	-
Stage 2	-	-	-	-	-	-				404	500	-
Critical Hdwy	4.14	-	-	4.12	-	-				6.63	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-				5.83	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.43	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-				3.519	4.019	3.319
Pot Cap-1 Maneuver	805	-	-	1064	-	-				~ 44	39	592
Stage 1	-	-	-	-	-	-				120	133	-
Stage 2	-	-	-	-	-	-				673	542	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	805	-	-	1064	-	-				~ 24	0	592
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 24	0	-
Stage 1	-	-	-	-	-	-				~ 66	0	-
Stage 2	-	-	-	-	-	-				673	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.1	$ 584.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	805	-	-	1064	-	-	24	592
HCM Lane V/C Ratio	-	-	-	0.453	-	-	3.578	0.231
HCM Control Delay (s)	0	-	-	11.1	-	-	$ 1495.3	12.9
HCM Lane LOS	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0	-	-	2.4	-	-	10.7	0.9

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	27.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	53	321	0	0	906	238	280	0	136	0	0	0
Future Vol, veh/h	53	321	0	0	906	238	280	0	136	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	0	-	300	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	58	349	0	0	985	259	304	0	148	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1243	0	0	349	0	0	956	1707	349
Stage 1	-	-	-	-	-	-	464	464	-
Stage 2	-	-	-	-	-	-	492	1243	-
Critical Hdwy	4.14	-	-	4.12	-	-	6.63	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.83	5.53	-
Follow-up Hdwy	2.22	-	-	2.218	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	556	-	-	1210	-	-	~ 271	91	693
Stage 1	-	-	-	-	-	-	632	563	-
Stage 2	-	-	-	-	-	-	581	245	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	556	-	-	1210	-	-	~ 243	0	693
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 243	0	-
Stage 1	-	-	-	-	-	-	566	0	-
Stage 2	-	-	-	-	-	-	581	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	127.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR
Capacity (veh/h)	243	693	556	-	-	1210	-	-
HCM Lane V/C Ratio	1.252	0.213	0.104	-	-	-	-	-
HCM Control Delay (s)	184.2	11.6	12.2	-	-	0	-	-
HCM Lane LOS	F	B	B	-	-	A	-	-
HCM 95th %tile Q(veh)	15.2	0.8	0.3	-	-	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	58.6
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	146	186	103	0	34	400	34	0	369	100	36
Future Vol, veh/h	0	146	186	103	0	34	400	34	0	369	100	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	159	202	112	0	37	435	37	0	401	109	39
Number of Lanes	0	1	1	1	0	1	1	1	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	3	3
HCM Control Delay	24.6	73	66.1
HCM LOS	C	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	369	100	36	146	186	103	34	400	34	54	100
LT Vol	369	0	0	146	0	0	34	0	0	54	0
Through Vol	0	100	0	0	186	0	0	400	0	0	100
RT Vol	0	0	36	0	0	103	0	0	34	0	0
Lane Flow Rate	401	109	39	159	202	112	37	435	37	59	109
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	1	0.318	0.107	0.494	0.602	0.312	0.115	1	0.103	0.179	0.316
Departure Headway (Hd)	11.024	10.538	9.858	11.337	10.846	10.159	11.205	10.719	10.038	10.963	10.477
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	333	342	365	321	336	356	322	343	358	329	345
Service Time	8.738	8.252	7.572	9.037	8.546	7.859	8.922	8.436	7.755	8.676	8.19
HCM Lane V/C Ratio	1.204	0.319	0.107	0.495	0.601	0.315	0.115	1.268	0.103	0.179	0.316
HCM Control Delay	84.2	18.1	13.8	24.6	28.7	17.4	15.4	82.9	13.9	16.1	18
HCM Lane LOS	F	C	B	C	D	C	C	F	B	C	C
HCM 95th-tile Q	11.1	1.3	0.4	2.6	3.7	1.3	0.4	11.2	0.3	0.6	1.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	54	100	520
Future Vol, veh/h	0	54	100	520
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	59	109	565
Number of Lanes	0	1	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	64.9
HCM LOS	F

Lane	SBLn3

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	2	135	12	150	223	10	3	0	128	21	1	6
Future Vol, veh/h	2	135	12	150	223	10	3	0	128	21	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	150	400	-	150	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	147	13	163	242	11	3	0	139	23	1	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	242	0	0	147	0	0	723	719	147	789	719	242
Stage 1	-	-	-	-	-	-	151	151	-	568	568	-
Stage 2	-	-	-	-	-	-	572	568	-	221	151	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1324	-	-	1435	-	-	342	354	900	308	354	797
Stage 1	-	-	-	-	-	-	851	772	-	508	506	-
Stage 2	-	-	-	-	-	-	505	506	-	781	772	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1324	-	-	1435	-	-	309	313	900	237	313	797
Mov Cap-2 Maneuver	-	-	-	-	-	-	309	313	-	237	313	-
Stage 1	-	-	-	-	-	-	850	771	-	507	449	-
Stage 2	-	-	-	-	-	-	443	449	-	659	771	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.1	9.9	19
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	309	900	1324	-	-	1435	-	-	237	653
HCM Lane V/C Ratio	0.011	0.155	0.002	-	-	0.114	-	-	0.096	0.012
HCM Control Delay (s)	16.8	9.7	7.7	-	-	7.8	-	-	21.8	10.6
HCM Lane LOS	C	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0.5	0	-	-	0.4	-	-	0.3	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Volume (veh/h)	3	432	17	43	743	7	19	0	103	4	0	7
Future Volume (veh/h)	3	432	17	43	743	7	19	0	103	4	0	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1750	1863	1750	1750	1863	1750	1750	1863	1750	1750	1863	1750
Adj Flow Rate, veh/h	3	470	18	47	808	8	21	0	112	4	0	8
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	41	919	35	75	885	9	115	29	522	226	25	394
Arrive On Green	0.52	0.52	0.52	0.52	0.52	0.52	0.39	0.00	0.39	0.39	0.00	0.39
Sat Flow, veh/h	2	1779	68	63	1714	17	175	73	1323	437	63	998
Grp Volume(v), veh/h	491	0	0	863	0	0	133	0	0	12	0	0
Grp Sat Flow(s),veh/h/ln	1849	0	0	1793	0	0	1572	0	0	1497	0	0
Q Serve(g_s), s	0.0	0.0	0.0	24.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	15.7	0.0	0.0	40.1	0.0	0.0	4.9	0.0	0.0	0.4	0.0	0.0
Prop In Lane	0.01		0.04	0.05		0.01	0.16		0.84	0.33		0.67
Lane Grp Cap(c), veh/h	995	0	0	968	0	0	666	0	0	644	0	0
V/C Ratio(X)	0.49	0.00	0.00	0.89	0.00	0.00	0.20	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	1107	0	0	1076	0	0	666	0	0	644	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.3	0.0	0.0	20.0	0.0	0.0	18.0	0.0	0.0	16.6	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	8.9	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	0.0	0.0	22.0	0.0	0.0	2.3	0.0	0.0	0.2	0.0	0.0
LnGrp Delay(d),s/veh	14.7	0.0	0.0	28.8	0.0	0.0	18.6	0.0	0.0	16.7	0.0	0.0
LnGrp LOS	B			C			B			B		
Approach Vol, veh/h		491			863			133			12	
Approach Delay, s/veh		14.7			28.8			18.6			16.7	
Approach LOS		B			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		39.5		50.5		39.5		50.5				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		30.0		52.0		30.0		52.0				
Max Q Clear Time (g_c+I1), s		6.9		17.7		2.4		42.1				
Green Ext Time (p_c), s		0.5		6.9		0.5		4.4				
Intersection Summary												
HCM 2010 Ctrl Delay			23.2									
HCM 2010 LOS			C									

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			↰↑↱		↰	↱		↰	↑	↱
Traffic Volume (veh/h)	20	275	5	31	806	70	24	0	148	138	0	113
Future Volume (veh/h)	20	275	5	31	806	70	24	0	148	138	0	113
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1750	1863	1750	1750	1863	1750	1716	1863	1750	1716	1863	1716
Adj Flow Rate, veh/h	22	299	5	34	876	76	26	0	161	150	0	123
Adj No. of Lanes	0	1	0	0	2	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	474	8	67	1107	95	720	0	871	641	1025	803
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.55	0.00	0.55	0.55	0.00	0.55
Sat Flow, veh/h	30	1315	21	68	3070	263	1163	0	1583	1124	1863	1458
Grp Volume(v), veh/h	326	0	0	509	0	477	26	0	161	150	0	123
Grp Sat Flow(s),veh/h/ln	1367	0	0	1752	0	1649	1163	0	1583	1124	1863	1458
Q Serve(g_s), s	1.9	0.0	0.0	0.0	0.0	23.4	0.9	0.0	4.6	6.9	0.0	3.7
Cycle Q Clear(g_c), s	25.3	0.0	0.0	23.5	0.0	23.4	0.9	0.0	4.6	11.5	0.0	3.7
Prop In Lane	0.07		0.02	0.07		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	536	0	0	675	0	595	720	0	871	641	1025	803
V/C Ratio(X)	0.61	0.00	0.00	0.75	0.00	0.80	0.04	0.00	0.18	0.23	0.00	0.15
Avail Cap(c_a), veh/h	779	0	0	942	0	843	720	0	871	641	1025	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.7	0.0	0.0	25.6	0.0	25.9	9.3	0.0	10.1	13.0	0.0	9.9
Incr Delay (d2), s/veh	1.1	0.0	0.0	2.2	0.0	3.8	0.1	0.0	0.5	0.9	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	0.0	11.7	0.0	11.2	0.3	0.0	2.1	2.3	0.0	1.6
LnGrp Delay(d),s/veh	23.8	0.0	0.0	27.8	0.0	29.6	9.4	0.0	10.6	13.9	0.0	10.3
LnGrp LOS	C			C		C	A		B	B		B
Approach Vol, veh/h		326			986			187			273	
Approach Delay, s/veh		23.8			28.7			10.4			12.3	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		53.5		36.5		53.5		36.5
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		36.0		46.0		36.0		46.0
Max Q Clear Time (g_c+I1), s		6.6		27.3		13.5		25.5
Green Ext Time (p_c), s		2.0		5.2		1.9		5.3

Intersection Summary		
HCM 2010 Ctrl Delay		23.3
HCM 2010 LOS		C

HCM 2010 Signalized Intersection Summary
4: SR 41 SB Ramps & Bush St

PM 2040+Project with MitigationÃ¯Â¿Â½
12/22/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱		↰	↑↑					↰	↑	↱
Traffic Volume (veh/h)	0	284	176	443	754	0	0	0	0	79	0	126
Future Volume (veh/h)	0	284	176	443	754	0	0	0	0	79	0	126
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1750	1716	1863	0				1716	1863	1716
Adj Flow Rate, veh/h	0	309	191	482	820	0				86	0	137
Adj No. of Lanes	0	1	0	1	2	0				1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	346	214	515	2368	0				432	492	385
Arrive On Green	0.00	0.32	0.32	0.32	0.67	0.00				0.26	0.00	0.26
Sat Flow, veh/h	0	1078	667	1634	3632	0				1634	1863	1458
Grp Volume(v), veh/h	0	0	500	482	820	0				86	0	137
Grp Sat Flow(s),veh/h/ln	0	0	1745	1634	1770	0				1634	1863	1458
Q Serve(g_s), s	0.0	0.0	32.7	34.4	12.0	0.0				4.9	0.0	9.2
Cycle Q Clear(g_c), s	0.0	0.0	32.7	34.4	12.0	0.0				4.9	0.0	9.2
Prop In Lane	0.00		0.38	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	0	559	515	2368	0				432	492	385
V/C Ratio(X)	0.00	0.00	0.89	0.94	0.35	0.00				0.20	0.00	0.36
Avail Cap(c_a), veh/h	0	0	625	640	2772	0				432	492	385
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	38.8	39.9	8.6	0.0				34.3	0.0	35.8
Incr Delay (d2), s/veh	0.0	0.0	14.3	18.9	0.1	0.0				1.0	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	17.9	18.2	5.8	0.0				2.3	0.0	4.0
LnGrp Delay(d),s/veh	0.0	0.0	53.1	58.9	8.6	0.0				35.3	0.0	38.4
LnGrp LOS			D	E	A					D		D
Approach Vol, veh/h		500			1302						223	
Approach Delay, s/veh		53.1			27.2						37.2	
Approach LOS		D			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			41.8	42.5		35.7		84.3
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			47.0	43.0		18.0		94.0
Max Q Clear Time (g_c+I1), s			36.4	34.7		11.2		14.0
Green Ext Time (p_c), s			1.4	3.7		0.4		6.7

Intersection Summary	
HCM 2010 Ctrl Delay	34.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑			↑↱		↰	↑	↱			
Traffic Volume (veh/h)	53	321	0	0	906	238	280	0	136	0	0	0
Future Volume (veh/h)	53	321	0	0	906	238	280	0	136	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1716	1863	0	0	1863	1750	1716	1863	1716			
Adj Flow Rate, veh/h	58	349	0	0	985	259	304	0	148			
Adj No. of Lanes	1	1	0	0	2	0	1	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	152	875	0	0	1304	342	721	822	644			
Arrive On Green	0.47	0.47	0.00	0.00	0.47	0.47	0.44	0.00	0.44			
Sat Flow, veh/h	410	1863	0	0	2870	728	1634	1863	1458			
Grp Volume(v), veh/h	58	349	0	0	627	617	304	0	148			
Grp Sat Flow(s),veh/h/ln	410	1863	0	0	1770	1734	1634	1863	1458			
Q Serve(g_s), s	12.2	11.0	0.0	0.0	26.2	26.4	11.5	0.0	5.7			
Cycle Q Clear(g_c), s	38.6	11.0	0.0	0.0	26.2	26.4	11.5	0.0	5.7			
Prop In Lane	1.00		0.00	0.00		0.42	1.00		1.00			
Lane Grp Cap(c), veh/h	152	875	0	0	831	815	721	822	644			
V/C Ratio(X)	0.38	0.40	0.00	0.00	0.75	0.76	0.42	0.00	0.23			
Avail Cap(c_a), veh/h	156	890	0	0	845	829	721	822	644			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	35.5	15.6	0.0	0.0	19.6	19.6	17.3	0.0	15.6			
Incr Delay (d2), s/veh	1.6	0.3	0.0	0.0	3.8	4.0	1.8	0.0	0.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.5	5.7	0.0	0.0	13.6	13.4	5.5	0.0	2.4			
LnGrp Delay(d),s/veh	37.1	15.9	0.0	0.0	23.4	23.7	19.1	0.0	16.5			
LnGrp LOS	D	B			C	C	B		B			
Approach Vol, veh/h		407			1244			452				
Approach Delay, s/veh		18.9			23.5			18.2				
Approach LOS		B			C			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		43.7		46.3				46.3
Change Period (Y+Rc), s		4.0		4.0				4.0
Max Green Setting (Gmax), s		39.0		43.0				43.0
Max Q Clear Time (g_c+I1), s		13.5		40.6				28.4
Green Ext Time (p_c), s		1.7		1.7				6.7

Intersection Summary			
HCM 2010 Ctrl Delay			21.5
HCM 2010 LOS			C

HCM 2010 Signalized Intersection Summary
6: S 19 1/2 Ave & Bush St

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	146	186	103	34	400	34	369	100	36	54	100	520
Future Volume (veh/h)	146	186	103	34	400	34	369	100	36	54	100	520
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1716	1863	1716	1716	1863	1716	1716	1863	1716	1716	1863	1716
Adj Flow Rate, veh/h	159	202	112	37	435	37	401	109	39	59	109	565
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	287	784	614	423	784	614	401	913	715	601	913	715
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, veh/h	845	1863	1458	977	1863	1458	701	1863	1458	1137	1863	1458
Grp Volume(v), veh/h	159	202	112	37	435	37	401	109	39	59	109	565
Grp Sat Flow(s),veh/h/ln	845	1863	1458	977	1863	1458	701	1863	1458	1137	1863	1458
Q Serve(g_s), s	15.7	6.3	4.3	2.3	15.9	1.4	41.3	2.9	1.3	2.7	2.9	29.0
Cycle Q Clear(g_c), s	31.6	6.3	4.3	8.6	15.9	1.4	44.1	2.9	1.3	5.5	2.9	29.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	784	614	423	784	614	401	913	715	601	913	715
V/C Ratio(X)	0.55	0.26	0.18	0.09	0.55	0.06	1.00	0.12	0.05	0.10	0.12	0.79
Avail Cap(c_a), veh/h	457	1159	907	619	1159	907	401	913	715	601	913	715
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	16.9	16.3	19.7	19.7	15.5	28.5	12.4	12.0	13.9	12.4	19.1
Incr Delay (d2), s/veh	1.7	0.2	0.1	0.1	0.6	0.0	44.6	0.3	0.1	0.3	0.3	8.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	3.3	1.8	0.6	8.2	0.6	14.9	1.5	0.5	0.9	1.5	13.3
LnGrp Delay(d),s/veh	33.3	17.1	16.5	19.8	20.3	15.5	73.1	12.7	12.2	14.2	12.7	27.8
LnGrp LOS	C	B	B	B	C	B	E	B	B	B	B	C
Approach Vol, veh/h		473			509			549			733	
Approach Delay, s/veh		22.4			19.9			56.8			24.5	
Approach LOS		C			B			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		48.1		41.9		48.1		41.9
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		26.0		56.0		26.0		56.0
Max Q Clear Time (g_c+I1), s		46.1		33.6		31.0		17.9
Green Ext Time (p_c), s		0.0		4.3		0.0		4.6

Intersection Summary		
HCM 2010 Ctrl Delay		30.8
HCM 2010 LOS		C

HCS ANALYSIS

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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year          2020
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
       Up/down       -       %      Access point density     8       /mi

Analysis direction volume, Vd  282     veh/h
Opposing direction volume, Vo  531     veh/h

___________________________Average Travel Speed______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.4                1.1
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.994
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi         314     pc/h       581     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.1     mi/h
Average travel speed, ATSd                  50.0    mi/h
Percent Free Flow Speed, PFFS                86.2    %




__________________________Percent Time-Spent-Following__________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1                1.0
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         308    pc/h         577     pc/h
Base percent time-spent-following,(note-4) BPTSFd  38.4   %
Adjustment for no-passing zones, fnp              24.5
Percent time-spent-following, PTSFd               46.9   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                      B
Volume to capacity ratio, v/c                 0.18
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60          0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                       1690    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      50.0    mi/h
Percent time-spent-following, PTSFd (from above)             46.9
Level of service, LOSd (from above)                          B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                      -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                 -
Percent time-spent-following
    including passing lane, PTSFpl                     -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                       306.5
Effective width of outside lane, We                    24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                             3.39
Bicycle LOS                                    C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.            R&S Civil
Date Performed        12/14/2020
Analysis Time Period  AM
Highway               Bush Street
From/To               College Ave/Semas Dr
Jurisdiction          Kings County
Analysis Year         2020
Description  Community College Expansion

___________________________________Input Data___________________________________

Highway class  Class 2           Peak hour factor, PHF    0.92
Shoulder width      6.0    ft     % Trucks and buses      6      %
Lane width         12.0    ft     % Trucks crawling       0.0    %
Segment length      0.0    mi     Truck crawl speed       0.0    mi/hr
Terrain type       Level          % Recreational vehicles  4     %
Grade:  Length      -      mi     % No-passing zones      20     %
      Up/down       -      %      Access point density     8      /mi

Analysis direction volume, Vd  208     veh/h
Opposing direction volume, Vo  515     veh/h

____________________________Average Travel Speed_______________________________

Direction                        Analysis(d)       Opposing (o)
PCE for trucks, ET                   1.5               1.1
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.971             0.994
Grade adj. factor,(note-1) fg          1.00              1.00
Directional flow rate,(note-2) vi         233     pc/h      563     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                      58.0    mi/h

Adjustment for no-passing zones, fnp          1.1     mi/h
Average travel speed, ATSd                  50.7    mi/h
Percent Free Flow Speed, PFFS                 87.5    %




__________________________Percent Time-Spent-Following__________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.1               1.0
PCE for RVs, ER                          1.0               1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        227    pc/h         560     pc/h
Base percent time-spent-following,(note-4) BPTSFd  30.9   %
Adjustment for no-passing zones, fnp              23.4
Percent time-spent-following, PTSFd               37.6   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                           A
Volume to capacity ratio, v/c                    0.13
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                           1700    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                     50.7    mi/h
Percent time-spent-following, PTSFd (from above)            37.6
Level of service, LOSd (from above)                          A

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                             -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                        -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     A
Peak 15-min total travel time, TT15              -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                        226.1
Effective width of outside lane, We                    24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              3.25
Bicycle LOS                                     C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                 Bush Street
From/To                 Semas Dr/Belle Haven Dr
Jurisdiction            Kings County
Analysis Year           2020
Description  Community College Expansion

___________________________________Input Data___________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
      Up/down        -       %      Access point density     8       /mi

Analysis direction volume, Vd  208     veh/h
Opposing direction volume, Vo  512     veh/h

____________________________Average Travel Speed_______________________________

Direction                          Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.5              1.1
PCE for RVs, ER                         1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.971              0.994
Grade adj. factor,(note-1) fg           1.00             1.00
Directional flow rate,(note-2) vi         233     pc/h        560     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                     58.0    mi/h

Adjustment for no-passing zones, fnp          1.1     mi/h
Average travel speed, ATSd                 50.8    mi/h
Percent Free Flow Speed, PFFS               87.5    %




__________________________Percent Time-Spent-Following__________________________

Direction                     Analysis(d)      Opposing (o)
PCE for trucks, ET                  1.1              1.0
PCE for RVs, ER                     1.0              1.0
Heavy-vehicle adjustment factor, fHV      0.994             1.000
Grade adjustment factor,(note-1) fg       1.00              1.00
Directional flow rate,(note-2) vi        227    pc/h        557     pc/h
Base percent time-spent-following,(note-4) BPTSFd  30.9   %
Adjustment for no-passing zones, fnp              23.6
Percent time-spent-following, PTSFd               37.7   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                           B
Volume to capacity ratio, v/c                     0.14
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                            1690    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    50.8    mi/h
Percent time-spent-following, PTSFd (from above)            37.7
Level of service, LOSd (from above)                         B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                         226.1
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.23
Bicycle LOS                                     C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
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Phone:                       Fax:
E-mail:

______________________________OPERATIONAL ANALYSIS___________________________________

Analyst:       Shalisha Hodson
Agency/Co:     R&S Civil
Date:          12/18/2020
Analysis Period: AM
Highway:       Bush Street
From/To:       SR 41 NB/N 19 1/2 Ave
Jurisdiction:  Kings County
Analysis Year:  2020
Project ID:    Community College Expansion

__________________________________FREE-FLOW SPEED____________________________________

           Direction         1             2
Lane width                  12.0     ft     12.0     ft
Lateral clearance:
   Right edge               6.0      ft     6.0      ft
   Left edge                6.0      ft     6.0      ft
   Total lateral clearance    12.0     ft     12.0     ft
Access points per mile         0              0
Median type
Free-flow speed:            Measured         Measured
   FFS or BFFS               55.0     mph     55.0     mph
Lane width adjustment, FLW        0.0      mph     0.0      mph
Lateral clearance adjustment, FLC   0.0      mph     0.0      mph
Median type adjustment, FM        0.0      mph     0.0      mph
Access points adjustment, FA      0.0      mph     0.0      mph
Free-flow speed              55.0     mph     55.0     mph

________________________________________VOLUME________________________________________

           Direction         1             2
Volume, V                   280      vph     722      vph
Peak-hour factor, PHF          0.92           0.92
Peak 15-minute volume, v15       76              196
Trucks and buses               5        %       5        %
Recreational vehicles          0        %       0        %
Terrain type                Level           Level
   Grade                    0.00     %      0.00     %
   Segment length             0.00     mi     0.00     mi
```

```
Number of lanes                    2               2
Driver population adjustment, fP     1.00            1.00
Trucks and buses PCE, ET           1.5             1.5
Recreational vehicles PCE, ER       1.2             1.2
Heavy vehicle adjustment, fHV       0.976           0.976
Flow rate, vp                    155      pcphpl   402      pcphpl

_____________________________________RESULTS_____________________________________

               Direction          1               2
Flow rate, vp                    155      pcphpl   402      pcphpl
Free-flow speed, FFS                55.0     mph      55.0     mph
Avg. passenger-car travel speed, S  55.0     mph      55.0     mph
Level of service, LOS               A               A
Density, D                       2.8      pc/mi/ln 7.3      pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp              55              55
Percent of segment with occupied
on-highway parking                  0               0
Pavement rating, P                  3               3
Flow rate in outside lane, vOL       152.2           392.4
Effective width of outside lane, We  24.00           24.00
Effective speed factor, St          4.79            4.79
Bicycle LOS Score, BLOS              2.72            3.20
Bicycle LOS                         C               C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-mail:

____________________________OPERATIONAL ANALYSIS_________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: AM
Highway:        Bush Street
From/To:        SR 41 SB/SR 41 NB
Jurisdiction:   Kings County
Analysis Year:  2020
Project ID:     Community College Expansion

________________________________FREE-FLOW SPEED__________________________________

             Direction          1               2
Lane width                    12.0      ft      12.0      ft
Lateral clearance:
   Right edge                 6.0       ft      6.0       ft
   Left edge                  6.0       ft      6.0       ft
   Total lateral clearance    12.0      ft      12.0      ft
Access points per mile        0                 0
Median type
Free-flow speed:              Measured          Measured
   FFS or BFFS                55.0      mph     55.0      mph
Lane width adjustment, FLW         0.0       mph     0.0       mph
Lateral clearance adjustment, FLC  0.0       mph     0.0       mph
Median type adjustment, FM         0.0       mph     0.0       mph
Access points adjustment, FA       0.0       mph     0.0       mph
Free-flow speed               55.0      mph     55.0      mph

_____________________________________VOLUME______________________________________

             Direction          1               2
Volume, V                     230       vph     728       vph
Peak-hour factor, PHF         0.92              0.92
Peak 15-minute volume, v15    62                198
Trucks and buses              5         %       5         %
Recreational vehicles         0         %       0         %
Terrain type                  Level             Level
  Grade                       0.00      %       0.00      %
  Segment length              0.00      mi      0.00      mi
```

```
Number of lanes                  2              2
Driver population adjustment, fP     1.00           1.00
Trucks and buses PCE, ET           1.5            1.5
Recreational vehicles PCE, ER       1.2            1.2
Heavy vehicle adjustment, fHV       0.976          0.976
Flow rate, vp                  128      pcphpl   405      pcphpl

____________________________________RESULTS____________________________________

               Direction          1              2
Flow rate, vp                  128      pcphpl   405      pcphpl
Free-flow speed, FFS              55.0     mph      55.0     mph
Avg. passenger-car travel speed, S   55.0     mph      55.0     mph
Level of service, LOS              A              A
Density, D                     2.3      pc/mi/ln 7.4      pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp             55             55
Percent of segment with occupied
on-highway parking                 0              0
Pavement rating, P                 3              3
Flow rate in outside lane, vOL       125.0          395.7
Effective width of outside lane, We  24.00          24.00
Effective speed factor, St          4.79           4.79
Bicycle LOS Score, BLOS              2.62           3.20
Bicycle LOS                        C              C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                 Bush Street
From/To                 Belle Haven Dr/SR 41
Jurisdiction            Kings County
Analysis Year           2020
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
        Up/down      -       %      Access point density     8       /mi

Analysis direction volume, Vd  531     veh/h
Opposing direction volume, Vo  282     veh/h

____________________________Average Travel Speed_______________________________

Direction                          Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1                1.4
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.977
Grade adj. factor,(note-1) fg           1.00               1.00
Directional flow rate,(note-2) vi        581     pc/h       314     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.5     mi/h
Average travel speed, ATSd                 49.5    mi/h
Percent Free Flow Speed, PFFS               85.4    %




_________________________Percent Time-Spent-Following_________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.0                1.1
PCE for RVs, ER                         1.0                1.0
Heavy-vehicle adjustment factor, fHV       1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         577    pc/h         308     pc/h
Base percent time-spent-following,(note-4) BPTSFd  52.1   %
Adjustment for no-passing zones, fnp              24.5
Percent time-spent-following, PTSFd              68.1   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         B
Volume to capacity ratio, v/c                   0.34
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                        1661    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                          1661    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                      49.5    mi/h
Percent time-spent-following, PTSFd (from above)             68.1
Level of service, LOSd (from above)                          B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                       -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -      veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                           55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                             3
Flow rate in outside lane, vOL                       577.2
Effective width of outside lane, We                    24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              3.71
Bicycle LOS                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                     Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2020
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 2            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level         % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
      Up/down      -       %      Access point density     8       /mi

Analysis direction volume, Vd  515     veh/h
Opposing direction volume, Vo  208     veh/h

____________________________Average Travel Speed______________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1               1.5
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.971
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi        563     pc/h        233     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.7     mi/h
Average travel speed, ATSd                  50.1    mi/h
Percent Free Flow Speed, PFFS                86.5    %




_________________________Percent Time-Spent-Following_________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.0                1.1
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         560    pc/h         227     pc/h
Base percent time-spent-following,(note-4) BPTSFd  49.2   %
Adjustment for no-passing zones, fnp              23.4
Percent time-spent-following, PTSFd               65.9   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         C
Volume to capacity ratio, v/c                    0.33
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                          0       veh/h
Capacity from PTSF, CdPTSF                        1690    veh/h
Directional Capacity                         1690    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                   50.1    mi/h
Percent time-spent-following, PTSFd (from above)             65.9
Level of service, LOSd (from above)                        C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                                -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                   -
Percent time-spent-following
   including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     A
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                         559.8
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.69
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2020
Description  Community College Expansion

_________________________________Input Data_________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length        -      mi     % No-passing zones       20      %
        Up/down       -      %      Access point density     8       /mi

Analysis direction volume, Vd  512     veh/h
Opposing direction volume, Vo  208     veh/h

___________________________Average Travel Speed_____________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1               1.5
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.971
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi        560     pc/h       233     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.7     mi/h
Average travel speed, ATSd                50.2    mi/h
Percent Free Flow Speed, PFFS               86.5    %




_________________________Percent Time-Spent-Following_________________________

Direction                     Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.0               1.1
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         557    pc/h         227     pc/h
Base percent time-spent-following,(note-4) BPTSFd  49.0   %
Adjustment for no-passing zones, fnp              23.6
Percent time-spent-following, PTSFd               65.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         B
Volume to capacity ratio, v/c                   0.33
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1651    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                          1651    veh/h

____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                     50.2    mi/h
Percent time-spent-following, PTSFd (from above)            65.8
Level of service, LOSd (from above)                         B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
```

```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                    -
Percent time-spent-following
    including passing lane, PTSFpl                        -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                         556.5
Effective width of outside lane, We                      24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                                3.69
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                 Bush Street
From/To                 Belle Haven Dr/SR 41
Jurisdiction            Kings County
Analysis Year           2020+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width       6.0    ft     % Trucks and buses       6       %
Lane width          12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0    mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level          % Recreational vehicles  4       %
Grade:  Length       -      mi     % No-passing zones       20      %
        Up/down      -      %      Access point density     8       /mi

Analysis direction volume, Vd  301     veh/h
Opposing direction volume, Vo  608     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.4                1.1
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.994
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi        335     pc/h       665     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.9     mi/h
Average travel speed, ATSd                  49.4    mi/h
Percent Free Flow Speed, PFFS                85.1    %




__________________________Percent Time-Spent-Following__________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1                1.0
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        329    pc/h         661     pc/h
Base percent time-spent-following,(note-4) BPTSFd  41.6   %
Adjustment for no-passing zones, fnp              22.2
Percent time-spent-following, PTSFd               49.0   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                         B
Volume to capacity ratio, v/c                    0.20
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                          1690    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    49.4    mi/h
Percent time-spent-following, PTSFd (from above)            49.0
Level of service, LOSd (from above)                        B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane_________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                    -
Percent time-spent-following
    including passing lane, PTSFpl                         -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking        0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          327.2
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.42
Bicycle LOS                                     C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction          Kings County
Analysis Year          2020+Project
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length        -      mi     % No-passing zones       20      %
       Up/down      -      %      Access point density     8       /mi

Analysis direction volume, Vd  229     veh/h
Opposing direction volume, Vo  601     veh/h

____________________________Average Travel Speed_______________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                          1.5              1.1
PCE for RVs, ER                             1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.971             0.994
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi         256     pc/h       657     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                        58.0    mi/h

Adjustment for no-passing zones, fnp          0.9     mi/h
Average travel speed, ATSd                   50.0    mi/h
Percent Free Flow Speed, PFFS                 86.3    %




__________________________Percent Time-Spent-Following__________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.1               1.0
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        250    pc/h         653     pc/h
Base percent time-spent-following,(note-4) BPTSFd  34.0   %
Adjustment for no-passing zones, fnp              20.9
Percent time-spent-following, PTSFd               39.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         B
Volume to capacity ratio, v/c                   0.15
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                          1690    veh/h

_____________________________Passing Lane Analysis_____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    50.0    mi/h
Percent time-spent-following, PTSFd (from above)           39.8
Level of service, LOSd (from above)                         B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                         248.9
Effective width of outside lane, We                      24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              3.28
Bicycle LOS                                     C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                         Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway               Bush Street
From/To               Semas Dr/Belle Haven Dr
Jurisdiction          Kings County
Analysis Year          2020+Project
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
     Up/down         -       %      Access point density     8       /mi

Analysis direction volume, Vd  229     veh/h
Opposing direction volume, Vo  598     veh/h

_____________________________Average Travel Speed______________________________

Direction                         Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.5              1.1
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.971            0.994
Grade adj. factor,(note-1) fg           1.00             1.00
Directional flow rate,(note-2) vi        256     pc/h      654     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.9     mi/h
Average travel speed, ATSd                  50.0    mi/h
Percent Free Flow Speed, PFFS                86.3    %




_________________________Percent Time-Spent-Following_________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.1                1.0
PCE for RVs, ER                          1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         250    pc/h        650     pc/h
Base percent time-spent-following,(note-4) BPTSFd  34.1   %
Adjustment for no-passing zones, fnp              21.0
Percent time-spent-following, PTSFd               39.9   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          B
Volume to capacity ratio, v/c                     0.15
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                          1690    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                           1690    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                     50.0    mi/h
Percent time-spent-following, PTSFd (from above)            39.9
Level of service, LOSd (from above)                          B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl      0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                        248.9
Effective width of outside lane, We                     24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.28
Bicycle LOS                                     C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                        Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: AM
Highway:        Bush Street
From/To:        SR 41 NB/N 19 1/2 Ave
Jurisdiction:   Kings County
Analysis Year:  2020+Project
Project ID:     Community College Expansion

_______________________________FREE-FLOW SPEED_________________________________

           Direction          1             2
Lane width                  12.0    ft    12.0    ft
Lateral clearance:
   Right edge               6.0     ft    6.0     ft
   Left edge                6.0     ft    6.0     ft
   Total lateral clearance  12.0    ft    12.0    ft
Access points per mile      0             0
Median type
Free-flow speed:            Measured      Measured
   FFS or BFFS              55.0    mph   55.0    mph
Lane width adjustment, FLW          0.0     mph   0.0     mph
Lateral clearance adjustment, FLC   0.0     mph   0.0     mph
Median type adjustment, FM          0.0     mph   0.0     mph
Access points adjustment, FA        0.0     mph   0.0     mph
Free-flow speed             55.0    mph   55.0    mph

____________________________________VOLUME_____________________________________

           Direction          1             2
Volume, V                   294     vph   779     vph
Peak-hour factor, PHF       0.92          0.92
Peak 15-minute volume, v15  80            212
Trucks and buses            5       %     5       %
Recreational vehicles       0       %     0       %
Terrain type                Level         Level
   Grade                    0.00    %     0.00    %
   Segment length           0.00    mi    0.00    mi
```

```
Number of lanes                  2                2
Driver population adjustment, fP     1.00             1.00
Trucks and buses PCE, ET           1.5              1.5
Recreational vehicles PCE, ER       1.2              1.2
Heavy vehicle adjustment, fHV       0.976            0.976
Flow rate, vp                   163      pcphpl   433      pcphpl

_____________________________________RESULTS_____________________________________

             Direction          1                2
Flow rate, vp                   163      pcphpl   433      pcphpl
Free-flow speed, FFS                55.0      mph      55.0      mph
Avg. passenger-car travel speed, S   55.0      mph      55.0      mph
Level of service, LOS               A                A
Density, D                      3.0      pc/mi/ln 7.9      pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp              55               55
Percent of segment with occupied
on-highway parking                  0                0
Pavement rating, P                  3                3
Flow rate in outside lane, vOL      159.8            423.4
Effective width of outside lane, We  24.00            24.00
Effective speed factor, St          4.79             4.79
Bicycle LOS Score, BLOS             2.75             3.24
Bicycle LOS                         C                C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                         Fax:
E-mail:

____________________________OPERATIONAL ANALYSIS_________________________________

Analyst:       Shalisha Hodson
Agency/Co:     R&S Civil
Date:          12/18/2020
Analysis Period: AM
Highway:       Bush Street
From/To:       SR 41 SB/SR 41 NB
Jurisdiction:  Kings County
Analysis Year: 2020+Project
Project ID:    Community College Expansion

________________________________FREE-FLOW SPEED__________________________________

           Direction          1               2
Lane width                  12.0     ft     12.0     ft
Lateral clearance:
   Right edge               6.0      ft     6.0      ft
   Left edge                6.0      ft     6.0      ft
   Total lateral clearance  12.0     ft     12.0     ft
Access points per mile      0               0
Median type
Free-flow speed:            Measured        Measured
   FFS or BFFS              55.0     mph    55.0     mph
Lane width adjustment, FLW           0.0     mph    0.0     mph
Lateral clearance adjustment, FLC    0.0     mph    0.0     mph
Median type adjustment, FM           0.0     mph    0.0     mph
Access points adjustment, FA         0.0     mph    0.0     mph
Free-flow speed             55.0     mph    55.0     mph

______________________________________VOLUME______________________________________

           Direction          1               2
Volume, V                   247      vph    798      vph
Peak-hour factor, PHF       0.92            0.92
Peak 15-minute volume, v15  67              217
Trucks and buses            5        %      5        %
Recreational vehicles       0        %      0        %
Terrain type                Level           Level
   Grade                    0.00     %      0.00     %
   Segment length           0.00     mi     0.00     mi
```

```
Number of lanes                    2                 2
Driver population adjustment, fP     1.00              1.00
Trucks and buses PCE, ET           1.5               1.5
Recreational vehicles PCE, ER        1.2               1.2
Heavy vehicle adjustment, fHV        0.976             0.976
Flow rate, vp                   137       pcphpl   444       pcphpl

_____________________________________RESULTS_____________________________________

              Direction          1                 2
Flow rate, vp                   137       pcphpl   444       pcphpl
Free-flow speed, FFS               55.0      mph       55.0      mph
Avg. passenger-car travel speed, S   55.0      mph       55.0      mph
Level of service, LOS               A                 A
Density, D                      2.5       pc/mi/ln 8.1       pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp             55                55
Percent of segment with occupied
on-highway parking                  0                 0
Pavement rating, P                 3                 3
Flow rate in outside lane, vOL       134.2             433.7
Effective width of outside lane, We  24.00             24.00
Effective speed factor, St         4.79              4.79
Bicycle LOS Score, BLOS               2.66              3.25
Bicycle LOS                      C                 C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                Shalisha Hodson
Agency/Co.               R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                  Bush Street
From/To                  Belle Haven Dr/SR 41
Jurisdiction             Kings County
Analysis Year            2020+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level           % Recreational vehicles  4       %
Grade:  Length        -      mi     % No-passing zones       20      %
     Up/down          -      %      Access point density     8       /mi

Analysis direction volume, Vd  608     veh/h
Opposing direction volume, Vo  301     veh/h

___________________________Average Travel Speed_____________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1              1.4
PCE for RVs, ER                        1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994             0.977
Grade adj. factor,(note-1) fg          1.00             1.00
Directional flow rate,(note-2) vi         665     pc/h       335     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp         1.5     mi/h
Average travel speed, ATSd                 48.8    mi/h
Percent Free Flow Speed, PFFS                84.1    %




_________________________Percent Time-Spent-Following_________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.0               1.1
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         661    pc/h        329     pc/h
Base percent time-spent-following,(note-4) BPTSFd  57.5   %
Adjustment for no-passing zones, fnp              22.2
Percent time-spent-following, PTSFd               72.3   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                       B
Volume to capacity ratio, v/c                 0.39
Peak 15-min vehicle-miles of travel, VMT15          0       veh-mi
Peak-hour vehicle-miles of travel, VMT60          0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                       1661    veh/h
Capacity from PTSF, CdPTSF                      1690    veh/h
Directional Capacity                        1661    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                   48.8    mi/h
Percent time-spent-following, PTSFd (from above)            72.3
Level of service, LOSd (from above)                       B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15              -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                         660.9
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.78
Bicycle LOS                                       D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                         Fax:
E-Mail:

____________________Directional Two-Lane Highway Segment Analysis__________________

Analyst                 Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                 Bush Street
From/To                 College Ave/Semas Dr
Jurisdiction            Kings County
Analysis Year           2020+Project
Description  Community College Expansion

________________________________________Input Data________________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
     Up/down         -       %      Access point density     8       /mi

Analysis direction volume, Vd  601     veh/h
Opposing direction volume, Vo  229     veh/h

_________________________________Average Travel Speed__________________________________

Direction                          Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.1                1.5
PCE for RVs, ER                          1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.971
Grade adj. factor,(note-1) fg             1.00               1.00
Directional flow rate,(note-2) vi         657     pc/h       256     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.6     mi/h
Average travel speed, ATSd                 49.3    mi/h
Percent Free Flow Speed, PFFS                85.0    %




_____________________________Percent Time-Spent-Following_____________________________

Direction                    Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.0                 1.1
PCE for RVs, ER                      1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               0.994
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         653    pc/h         250     pc/h
Base percent time-spent-following,(note-4) BPTSFd  55.6   %
Adjustment for no-passing zones, fnp              20.9
Percent time-spent-following, PTSFd               70.7   %

__________________Level of Service and Other Performance Measures_________________

Level of service, LOS                      B
Volume to capacity ratio, v/c                0.39
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                         1661    veh/h
Capacity from PTSF, CdPTSF                        1690    veh/h
Directional Capacity                       1661    veh/h

_________________________________Passing Lane Analysis_________________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                     49.3    mi/h
Percent time-spent-following, PTSFd (from above)            70.7
Level of service, LOSd (from above)                       B

_____________________Average Travel Speed  with Passing Lane_____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                             -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

__________________Percent Time-Spent-Following with Passing Lane_________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                 -
Percent time-spent-following
   including passing lane, PTSFpl                     -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          653.3
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.77
Bicycle LOS                                      D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
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_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                 Bush Street
From/To                 Semas Dr/Belle Haven Dr
Jurisdiction            Kings County
Analysis Year           2020+Project
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
       Up/down       -       %      Access point density     8       /mi

Analysis direction volume, Vd  598     veh/h
Opposing direction volume, Vo  229     veh/h

____________________________Average Travel Speed_______________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1               1.5
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.971
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi        654     pc/h       256     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -     mi/h
Observed total demand,(note-3) V               -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.6     mi/h
Average travel speed, ATSd                  49.3    mi/h
Percent Free Flow Speed, PFFS                 85.0    %




__________________________Percent Time-Spent-Following__________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.0               1.1
PCE for RVs, ER                         1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         650    pc/h         250     pc/h
Base percent time-spent-following,(note-4) BPTSFd  55.4   %
Adjustment for no-passing zones, fnp              21.0
Percent time-spent-following, PTSFd               70.6   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                           B
Volume to capacity ratio, v/c                     0.38
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                         1661    veh/h
Capacity from PTSF, CdPTSF                        1690    veh/h
Directional Capacity                         1661    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                  49.3    mi/h
Percent time-spent-following, PTSFd (from above)            70.6
Level of service, LOSd (from above)                       B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          650.0
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                 3.77
Bicycle LOS                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
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____________________Directional Two-Lane Highway Segment Analysis__________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year           2024
Description  Community College Expansion

_______________________________________Input Data_______________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
      Up/down        -       %      Access point density     8       /mi

Analysis direction volume, Vd  308     veh/h
Opposing direction volume, Vo  576     veh/h

________________________________Average Travel Speed__________________________________

Direction                           Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.4                1.1
PCE for RVs, ER                          1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.994
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi          343     pc/h      630     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0      mi/h
Adj. for access point density,(note-3) fA      2.0      mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.0     mi/h
Average travel speed, ATSd                  49.5    mi/h
Percent Free Flow Speed, PFFS                 85.3    %




__________________________Percent Time-Spent-Following__________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.1                1.0
PCE for RVs, ER                         1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         337    pc/h         626     pc/h
Base percent time-spent-following,(note-4) BPTSFd  41.6   %
Adjustment for no-passing zones, fnp              23.3
Percent time-spent-following, PTSFd               49.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          B
Volume to capacity ratio, v/c                    0.20
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                         1690    veh/h

______________________________Passing Lane Analysis_____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                   49.5    mi/h
Percent time-spent-following, PTSFd (from above)            49.8
Level of service, LOSd (from above)                        B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                                -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl      0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl      E
Peak 15-min total travel time, TT15                -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                               55
Percent of segment with occupied on-highway parking        0
Pavement rating, P                                  3
Flow rate in outside lane, vOL                            334.8
Effective width of outside lane, We                         24.00
Effective speed factor, St                           4.79
Bicycle LOS Score, BLOS                                 3.43
Bicycle LOS                                       C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                      Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.            R&S Civil
Date Performed        12/14/2020
Analysis Time Period    AM
Highway               Bush Street
From/To               College Ave/Semas Dr
Jurisdiction          Kings County
Analysis Year         2024
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6      %
Lane width         12.0    ft    % Trucks crawling        0.0    %
Segment length      0.0    mi    Truck crawl speed        0.0    mi/hr
Terrain type        Level        % Recreational vehicles  4      %
Grade:  Length      -      mi    % No-passing zones       20     %
     Up/down        -      %     Access point density     8      /mi

Analysis direction volume, Vd  304     veh/h
Opposing direction volume, Vo  538     veh/h

_____________________________Average Travel Speed______________________________

Direction                       Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.4              1.1
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977            0.994
Grade adj. factor,(note-1) fg          1.00             1.00
Directional flow rate,(note-2) vi       338    pc/h      588    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -     mi/h
Observed total demand,(note-3) V               -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.0     mi/h
Average travel speed, ATSd               49.8    mi/h
Percent Free Flow Speed, PFFS              85.8    %




___________________________Percent Time-Spent-Following___________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                  1.1              1.0
PCE for RVs, ER                     1.0              1.0
Heavy-vehicle adjustment factor, fHV      0.994             1.000
Grade adjustment factor,(note-1) fg      1.00              1.00
Directional flow rate,(note-2) vi       332    pc/h        585     pc/h
Base percent time-spent-following,(note-4) BPTSFd  40.0   %
Adjustment for no-passing zones, fnp             24.6
Percent time-spent-following, PTSFd              48.9   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                          B
Volume to capacity ratio, v/c                    0.20
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                          1690    veh/h

________________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                  49.8    mi/h
Percent time-spent-following, PTSFd (from above)             48.9
Level of service, LOSd (from above)                       B

_____________________Average Travel Speed  with Passing Lane_____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                             -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                         330.4
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.42
Bicycle LOS                                      C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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_______________Directional Two-Lane Highway Segment Analysis______________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year           2024
Description  Community College Expansion

______________________________Input Data______________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width       6.0    ft    % Trucks and buses       6      %
Lane width          12.0    ft   % Trucks crawling        0.0     %
Segment length       0.0    mi    Truck crawl speed        0.0    mi/hr
Terrain type        Level        % Recreational vehicles  4       %
Grade:  Length       -     mi    % No-passing zones       20      %
     Up/down      -      %     Access point density     8      /mi

Analysis direction volume, Vd  221     veh/h
Opposing direction volume, Vo  567     veh/h

_________________________Average Travel Speed__________________________

Direction                      Analysis(d)       Opposing (o)
PCE for trucks, ET                   1.5               1.1
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.971             0.994
Grade adj. factor,(note-1) fg          1.00              1.00
Directional flow rate,(note-2) vi        247     pc/h       620     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM            -     mi/h
Observed total demand,(note-3) V             -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS           60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                   58.0    mi/h

Adjustment for no-passing zones, fnp          1.0     mi/h
Average travel speed, ATSd                 50.3    mi/h
Percent Free Flow Speed, PFFS                86.7    %



__________________________Percent Time-Spent-Following__________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.1               1.0
PCE for RVs, ER                          1.0               1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         242    pc/h         616     pc/h
Base percent time-spent-following,(note-4) BPTSFd  32.7   %
Adjustment for no-passing zones, fnp              21.7
Percent time-spent-following, PTSFd               38.8   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                         B
Volume to capacity ratio, v/c                   0.15
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                          1690    veh/h

______________________________Passing Lane Analysis_____________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    50.3    mi/h
Percent time-spent-following, PTSFd (from above)             38.8
Level of service, LOSd (from above)                         B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                        -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                       240.2
Effective width of outside lane, We                    24.00
Effective speed factor, St                         4.79
Bicycle LOS Score, BLOS                                3.26
Bicycle LOS                                   C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                    Fax:
E-mail:

_______________________OPERATIONAL ANALYSIS____________________________

Analyst:       Shalisha Hodson
Agency/Co:      R&S Civil
Date:          12/18/2020
Analysis Period: AM
Highway:        Bush Street
From/To:        SR 41 NB/N 19 1/2 Ave
Jurisdiction:   Kings County
Analysis Year:  2024
Project ID:     Community College Expansion

__________________________FREE-FLOW SPEED_______________________________

          Direction         1              2
Lane width                  12.0    ft     12.0    ft
Lateral clearance:
   Right edge               6.0     ft     6.0     ft
   Left edge                6.0     ft     6.0     ft
   Total lateral clearance  12.0    ft     12.0    ft
Access points per mile      0              0
Median type
Free-flow speed:            Measured       Measured
   FFS or BFFS              55.0    mph    55.0    mph
Lane width adjustment, FLW          0.0     mph    0.0     mph
Lateral clearance adjustment, FLC   0.0     mph    0.0     mph
Median type adjustment, FM          0.0     mph    0.0     mph
Access points adjustment, FA        0.0     mph    0.0     mph
Free-flow speed             55.0    mph    55.0    mph

_______________________________VOLUME__________________________________

          Direction         1              2
Volume, V                   304     vph    803     vph
Peak-hour factor, PHF       0.92           0.92
Peak 15-minute volume, v15  83             218
Trucks and buses            5       %      5       %
Recreational vehicles       0       %      0       %
Terrain type                Level          Level
  Grade                     0.00    %      0.00    %
  Segment length            0.00    mi     0.00    mi
```

```
Number of lanes                    2               2
Driver population adjustment, fP     1.00            1.00
Trucks and buses PCE, ET           1.5             1.5
Recreational vehicles PCE, ER       1.2             1.2
Heavy vehicle adjustment, fHV       0.976           0.976
Flow rate, vp                    169      pcphpl   447      pcphpl

_____________________________________RESULTS_____________________________________

            Direction         1               2
Flow rate, vp                    169      pcphpl   447      pcphpl
Free-flow speed, FFS               55.0      mph      55.0      mph
Avg. passenger-car travel speed, S   55.0      mph      55.0      mph
Level of service, LOS              A               A
Density, D                      3.1      pc/mi/ln 8.1      pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp             55              55
Percent of segment with occupied
on-highway parking                 0               0
Pavement rating, P                 3               3
Flow rate in outside lane, vOL       165.2           436.4
Effective width of outside lane, We  24.00           24.00
Effective speed factor, St          4.79            4.79
Bicycle LOS Score, BLOS             2.76            3.25
Bicycle LOS                       C               C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-mail:

____________________________OPERATIONAL ANALYSIS_________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: AM
Highway:        Bush Street
From/To:        SR 41 SB/SR 41 NB
Jurisdiction:   Kings County
Analysis Year:  2024
Project ID:     Community College Expansion

________________________________FREE-FLOW SPEED__________________________________

            Direction          1              2
Lane width                    12.0     ft      12.0     ft
Lateral clearance:
   Right edge                 6.0      ft      6.0      ft
   Left edge                  6.0      ft      6.0      ft
   Total lateral clearance    12.0     ft      12.0     ft
Access points per mile        0               0
Median type
Free-flow speed:              Measured        Measured
   FFS or BFFS                55.0     mph     55.0     mph
Lane width adjustment, FLW         0.0      mph    0.0      mph
Lateral clearance adjustment, FLC  0.0      mph    0.0      mph
Median type adjustment, FM         0.0      mph    0.0      mph
Access points adjustment, FA       0.0      mph    0.0      mph
Free-flow speed               55.0     mph     55.0     mph

_____________________________________VOLUME______________________________________

            Direction          1              2
Volume, V                     251      vph     794      vph
Peak-hour factor, PHF         0.92            0.92
Peak 15-minute volume, v15    68              216
Trucks and buses              5        %       5        %
Recreational vehicles         0        %       0        %
Terrain type                  Level           Level
  Grade                       0.00     %       0.00     %
  Segment length              0.00     mi      0.00     mi
```

```
Number of lanes                    2               2
Driver population adjustment, fP     1.00            1.00
Trucks and buses PCE, ET           1.5             1.5
Recreational vehicles PCE, ER       1.2             1.2
Heavy vehicle adjustment, fHV       0.976           0.976
Flow rate, vp                   139      pcphpl   442      pcphpl

_____________________________RESULTS_____________________________

            Direction          1               2
Flow rate, vp                   139      pcphpl   442      pcphpl
Free-flow speed, FFS              55.0      mph      55.0      mph
Avg. passenger-car travel speed, S   55.0      mph      55.0      mph
Level of service, LOS             A               A
Density, D                      2.5      pc/mi/ln 8.0      pc/mi/ln

____________________ Bicycle Level of Service ____________________

Posted speed limit, Sp             55              55
Percent of segment with occupied
on-highway parking                 0               0
Pavement rating, P                3               3
Flow rate in outside lane, vOL      136.4           431.5
Effective width of outside lane, We  24.00           24.00
Effective speed factor, St          4.79            4.79
Bicycle LOS Score, BLOS             2.66            3.25
Bicycle LOS                      C               C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-Mail:

________________Directional Two-Lane Highway Segment Analysis_______________

Analyst                 Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                 Bush Street
From/To                 Belle Haven Dr/SR 41
Jurisdiction            Kings County
Analysis Year           2024
Description  Community College Expansion

________________________________Input Data________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6      %
Lane width         12.0    ft    % Trucks crawling        0.0    %
Segment length      0.0    mi    Truck crawl speed        0.0    mi/hr
Terrain type        Level        % Recreational vehicles  4      %
Grade:  Length      -      mi    % No-passing zones       20     %
      Up/down       -      %     Access point density     8      /mi

Analysis direction volume, Vd  576     veh/h
Opposing direction volume, Vo  308     veh/h

__________________________Average Travel Speed____________________________

Direction                         Analysis(d)       Opposing (o)
PCE for trucks, ET                     1.1               1.4
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994             0.977
Grade adj. factor,(note-1) fg          1.00              1.00
Directional flow rate,(note-2) vi        630     pc/h       343     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -     mi/h
Observed total demand,(note-3) V                -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                     58.0    mi/h

Adjustment for no-passing zones, fnp          1.5     mi/h
Average travel speed, ATSd                 49.0    mi/h
Percent Free Flow Speed, PFFS               84.5    %




__________________________Percent Time-Spent-Following__________________________

Direction                     Analysis(d)        Opposing (o)
PCE for trucks, ET                  1.0                1.1
PCE for RVs, ER                     1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         626    pc/h         337     pc/h
Base percent time-spent-following,(note-4) BPTSFd  55.2   %
Adjustment for no-passing zones, fnp              23.3
Percent time-spent-following, PTSFd               70.3   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          B
Volume to capacity ratio, v/c                    0.37
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1661    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                           1661    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                     0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    49.0    mi/h
Percent time-spent-following, PTSFd (from above)             70.3
Level of service, LOSd (from above)                         B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde   -      mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld   -      mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -      veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                               55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                           626.1
Effective width of outside lane, We                        24.00
Effective speed factor, St                            4.79
Bicycle LOS Score, BLOS                                  3.75
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2024
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width      6.0    ft     % Trucks and buses       6       %
Lane width         12.0    ft     % Trucks crawling        0.0     %
Segment length      0.0    mi     Truck crawl speed        0.0     mi/hr
Terrain type       Level          % Recreational vehicles  4       %
Grade:  Length      -      mi     % No-passing zones       20      %
      Up/down       -      %      Access point density     8       /mi

Analysis direction volume, Vd  538     veh/h
Opposing direction volume, Vo  304     veh/h

____________________________Average Travel Speed_______________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.1               1.4
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.977
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi         588     pc/h        338     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.5     mi/h
Average travel speed, ATSd                  49.3    mi/h
Percent Free Flow Speed, PFFS                85.1    %




__________________________Percent Time-Spent-Following__________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.0               1.1
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        585    pc/h         332     pc/h
Base percent time-spent-following,(note-4) BPTSFd  53.2   %
Adjustment for no-passing zones, fnp              24.6
Percent time-spent-following, PTSFd               68.9   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                          B
Volume to capacity ratio, v/c                    0.35
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1661    veh/h
Capacity from PTSF, CdPTSF                        1690    veh/h
Directional Capacity                           1661    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                   49.3    mi/h
Percent time-spent-following, PTSFd (from above)            68.9
Level of service, LOSd (from above)                         B

____________________Average Travel Speed  with Passing Lane_____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde      -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                             -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                           55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                       584.8
Effective width of outside lane, We                    24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              3.72
Bicycle LOS                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2024
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level          % Recreational vehicles  4       %
Grade:  Length       -      mi     % No-passing zones       20      %
        Up/down      -      %      Access point density     8       /mi

Analysis direction volume, Vd  567     veh/h
Opposing direction volume, Vo  221     veh/h

___________________________Average Travel Speed______________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.1               1.5
PCE for RVs, ER                          1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994            0.971
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi         620     pc/h       247     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.7     mi/h
Average travel speed, ATSd               49.6    mi/h
Percent Free Flow Speed, PFFS             85.6    %



__________________________Percent Time-Spent-Following__________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.0              1.1
PCE for RVs, ER                      1.0              1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00              1.00
Directional flow rate,(note-2) vi        616    pc/h        242     pc/h
Base percent time-spent-following,(note-4) BPTSFd  53.8   %
Adjustment for no-passing zones, fnp             21.7
Percent time-spent-following, PTSFd              69.4   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                          B
Volume to capacity ratio, v/c                   0.36
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60          0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                      1651    veh/h
Capacity from PTSF, CdPTSF                     1690    veh/h
Directional Capacity                       1651    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                    0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl              -       mi
Average travel speed, ATSd (from above)                 49.6    mi/h
Percent time-spent-following, PTSFd (from above)            69.4
Level of service, LOSd (from above)                      B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                    -
Percent time-spent-following
    including passing lane, PTSFpl                         -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                                 55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                   3
Flow rate in outside lane, vOL                           616.3
Effective width of outside lane, We                        24.00
Effective speed factor, St                            4.79
Bicycle LOS Score, BLOS                                    3.74
Bicycle LOS                                        D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                    Fax:
E-Mail:

_______________Directional Two-Lane Highway Segment Analysis______________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year          2024+Project
Description  Community College Expansion

______________________________Input Data______________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
     Up/down         -       %      Access point density     8       /mi

Analysis direction volume, Vd  327     veh/h
Opposing direction volume, Vo  653     veh/h

_________________________Average Travel Speed__________________________

Direction                        Analysis(d)       Opposing (o)
PCE for trucks, ET                   1.3               1.1
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982             0.994
Grade adj. factor,(note-1) fg        1.00              1.00
Directional flow rate,(note-2) vi        362    pc/h       714    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.8     mi/h
Average travel speed, ATSd                 48.9    mi/h
Percent Free Flow Speed, PFFS               84.3    %




__________________________Percent Time-Spent-Following__________________________

Direction                     Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.1               1.0
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        358    pc/h         710     pc/h
Base percent time-spent-following,(note-4) BPTSFd  44.7   %
Adjustment for no-passing zones, fnp             21.1
Percent time-spent-following, PTSFd              51.8   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.21
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60          0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                       1690    veh/h
Capacity from PTSF, CdPTSF                      1700    veh/h
Directional Capacity                         1690    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                    0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl               -       mi
Average travel speed, ATSd (from above)                  48.9    mi/h
Percent time-spent-following, PTSFd (from above)            51.8
Level of service, LOSd (from above)                       B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                        -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          355.4
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.46
Bicycle LOS                                       C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2024+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.88
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
      Up/down        -       %      Access point density     8       /mi

Analysis direction volume, Vd  279     veh/h
Opposing direction volume, Vo  653     veh/h

___________________________Average Travel Speed______________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.4               1.1
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977             0.994
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi         325     pc/h       747     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.7     mi/h
Average travel speed, ATSd                 49.0    mi/h
Percent Free Flow Speed, PFFS                84.5    %



__________________________Percent Time-Spent-Following__________________________

Direction                    Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1                1.0
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        319    pc/h         742     pc/h
Base percent time-spent-following,(note-4) BPTSFd  42.0   %
Adjustment for no-passing zones, fnp             19.7
Percent time-spent-following, PTSFd              47.9   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                         B
Volume to capacity ratio, v/c                   0.19
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                          1690    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    49.0    mi/h
Percent time-spent-following, PTSFd (from above)            47.9
Level of service, LOSd (from above)                         B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl      0.0     %

_________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                           55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                       317.0
Effective width of outside lane, We                    24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              3.40
Bicycle LOS                                   C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2024+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
     Up/down         -       %      Access point density     8       /mi

Analysis direction volume, Vd  242     veh/h
Opposing direction volume, Vo  653     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.4                1.1
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.994
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi         269     pc/h       714     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp           0.8     mi/h
Average travel speed, ATSd                  49.6    mi/h
Percent Free Flow Speed, PFFS                85.5    %




_________________________Percent Time-Spent-Following_________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1                1.0
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         265    pc/h         710     pc/h
Base percent time-spent-following,(note-4) BPTSFd  36.8   %
Adjustment for no-passing zones, fnp              19.5
Percent time-spent-following, PTSFd               42.1   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          B
Volume to capacity ratio, v/c                    0.16
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                           1690    veh/h

______________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                  -       mi
Average travel speed, ATSd (from above)                      49.6    mi/h
Percent time-spent-following, PTSFd (from above)            42.1
Level of service, LOSd (from above)                        B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                        263.0
Effective width of outside lane, We                     24.00
Effective speed factor, St                         4.79
Bicycle LOS Score, BLOS                             3.31
Bicycle LOS                                   C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                    Fax:
E-mail:

_________________________OPERATIONAL ANALYSIS______________________________

Analyst:       Shalisha Hodson
Agency/Co:     R&S Civil
Date:          12/18/2020
Analysis Period: AM
Highway:       Bush Street
From/To:       SR 41 NB/N 19 1/2 Ave
Jurisdiction:  Kings County
Analysis Year: 2024+Project
Project ID:    Community College Expansion

_____________________________FREE-FLOW SPEED_______________________________

         Direction           1              2
Lane width                 12.0    ft     12.0    ft
Lateral clearance:
  Right edge               6.0     ft     6.0     ft
  Left edge                6.0     ft     6.0     ft
  Total lateral clearance  12.0    ft     12.0    ft
Access points per mile     0              0
Median type
Free-flow speed:           Measured       Measured
  FFS or BFFS              55.0    mph    55.0    mph
Lane width adjustment, FLW          0.0     mph    0.0     mph
Lateral clearance adjustment, FLC   0.0     mph    0.0     mph
Median type adjustment, FM          0.0     mph    0.0     mph
Access points adjustment, FA        0.0     mph    0.0     mph
Free-flow speed            55.0    mph    55.0    mph

__________________________________VOLUME___________________________________

         Direction           1              2
Volume, V                  318     vph    860     vph
Peak-hour factor, PHF      0.92           0.92
Peak 15-minute volume, v15 86             234
Trucks and buses           5       %      5       %
Recreational vehicles      0       %      0       %
Terrain type               Level          Level
  Grade                    0.00    %      0.00    %
  Segment length           0.00    mi     0.00    mi
```

```
Number of lanes                 2              2
Driver population adjustment, fP     1.00           1.00
Trucks and buses PCE, ET          1.5            1.5
Recreational vehicles PCE, ER       1.2            1.2
Heavy vehicle adjustment, fHV      0.976          0.976
Flow rate, vp                   177      pcphpl   479      pcphpl

______________________________RESULTS______________________________

             Direction          1              2
Flow rate, vp                   177      pcphpl   479      pcphpl
Free-flow speed, FFS             55.0     mph      55.0     mph
Avg. passenger-car travel speed, S   55.0     mph      55.0     mph
Level of service, LOS             A              A
Density, D                      3.2      pc/mi/ln 8.7      pc/mi/ln

______________________ Bicycle Level of Service ______________________

Posted speed limit, Sp            55             55
Percent of segment with occupied
on-highway parking                0              0
Pavement rating, P                3              3
Flow rate in outside lane, vOL      172.8          467.4
Effective width of outside lane, We  24.00          24.00
Effective speed factor, St          4.79           4.79
Bicycle LOS Score, BLOS              2.79           3.29
Bicycle LOS                        C              C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                        Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: AM
Highway:        Bush Street
From/To:        SR 41 SB/SR 41 NB
Jurisdiction:   Kings County
Analysis Year:  2024+Project
Project ID:     Community College Expansion

_______________________________FREE-FLOW SPEED_________________________________

         Direction           1               2
Lane width                  12.0    ft      12.0    ft
Lateral clearance:
   Right edge               6.0     ft      6.0     ft
   Left edge                6.0     ft      6.0     ft
   Total lateral clearance  12.0    ft      12.0    ft
Access points per mile       0               0
Median type
Free-flow speed:            Measured        Measured
   FFS or BFFS              55.0    mph     55.0    mph
Lane width adjustment, FLW          0.0     mph     0.0     mph
Lateral clearance adjustment, FLC   0.0     mph     0.0     mph
Median type adjustment, FM          0.0     mph     0.0     mph
Access points adjustment, FA        0.0     mph     0.0     mph
Free-flow speed             55.0    mph     55.0    mph

____________________________________VOLUME_____________________________________

         Direction           1               2
Volume, V                   268     vph     864     vph
Peak-hour factor, PHF       0.92            0.92
Peak 15-minute volume, v15  73              235
Trucks and buses             5      %        5      %
Recreational vehicles        0      %        0      %
Terrain type                Level           Level
   Grade                    0.00    %       0.00    %
   Segment length           0.00    mi      0.00    mi
```

```
Number of lanes                  2              2
Driver population adjustment, fP     1.00           1.00
Trucks and buses PCE, ET         1.5            1.5
Recreational vehicles PCE, ER       1.2            1.2
Heavy vehicle adjustment, fHV       0.976          0.976
Flow rate, vp                    149     pcphpl   481     pcphpl

_____________________________________RESULTS_____________________________________

            Direction        1              2
Flow rate, vp                    149     pcphpl   481     pcphpl
Free-flow speed, FFS              55.0     mph     55.0     mph
Avg. passenger-car travel speed, S   55.0     mph     55.0     mph
Level of service, LOS               A              A
Density, D                       2.7     pc/mi/ln 8.7     pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp            55             55
Percent of segment with occupied
on-highway parking                0              0
Pavement rating, P                3              3
Flow rate in outside lane, vOL       145.7          469.6
Effective width of outside lane, We  24.00          24.00
Effective speed factor, St          4.79           4.79
Bicycle LOS Score, BLOS              2.70           3.29
Bicycle LOS                        C              C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                        Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                 Bush Street
From/To                 Belle Haven Dr/SR 41
Jurisdiction            Kings County
Analysis Year           2024+Project
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
        Up/down      -       %      Access point density     8       /mi

Analysis direction volume, Vd  653     veh/h
Opposing direction volume, Vo  327     veh/h

____________________________Average Travel Speed_______________________________

Direction                          Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1                1.3
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.982
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi         714     pc/h       362     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                      58.0    mi/h

Adjustment for no-passing zones, fnp          1.4     mi/h
Average travel speed, ATSd                 48.2    mi/h
Percent Free Flow Speed, PFFS               83.1    %




___________________________Percent Time-Spent-Following___________________________

Direction                    Analysis(d)        Opposing (o)
PCE for trucks, ET                  1.0                1.1
PCE for RVs, ER                     1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        710    pc/h         358     pc/h
Base percent time-spent-following,(note-4) BPTSFd  59.9   %
Adjustment for no-passing zones, fnp             21.1
Percent time-spent-following, PTSFd              73.9   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                         C
Volume to capacity ratio, v/c                   0.42
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1669    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                          1669    veh/h

_______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    48.2    mi/h
Percent time-spent-following, PTSFd (from above)             73.9
Level of service, LOSd (from above)                          C

____________________Average Travel Speed  with Passing Lane_____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                         -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking        0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          709.8
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                 3.81
Bicycle LOS                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                        Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2024+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.88
Shoulder width      6.0    ft    % Trucks and buses       6      %
Lane width         12.0    ft    % Trucks crawling        0.0    %
Segment length      0.0    mi    Truck crawl speed        0.0    mi/hr
Terrain type        Level        % Recreational vehicles  4      %
Grade:  Length      -      mi    % No-passing zones       20     %
     Up/down        -      %     Access point density     8      /mi

Analysis direction volume, Vd  653     veh/h
Opposing direction volume, Vo  279     veh/h

____________________________Average Travel Speed______________________________

Direction                          Analysis(d)       Opposing (o)
PCE for trucks, ET                      1.1               1.4
PCE for RVs, ER                         1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV   0.994             0.977
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi        747    pc/h       325    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM            -     mi/h
Observed total demand,(note-3) V              -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                     58.0    mi/h

Adjustment for no-passing zones, fnp          1.5     mi/h
Average travel speed, ATSd                 48.2    mi/h
Percent Free Flow Speed, PFFS               83.1    %




_________________________Percent Time-Spent-Following_________________________

Direction                      Analysis(d)       Opposing (o)
PCE for trucks, ET                     1.0               1.1
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        742    pc/h         319     pc/h
Base percent time-spent-following,(note-4) BPTSFd  62.0   %
Adjustment for no-passing zones, fnp              19.7
Percent time-spent-following, PTSFd               75.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                        C
Volume to capacity ratio, v/c                  0.44
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60          0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1661    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                         1661    veh/h

____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    48.2    mi/h
Percent time-spent-following, PTSFd (from above)            75.8
Level of service, LOSd (from above)                         C

___________________Average Travel Speed  with Passing Lane___________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                       -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl      0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -      veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                        742.0
Effective width of outside lane, We                     24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                             3.84
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                        Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2024+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level         % Recreational vehicles  4       %
Grade:  Length       -      mi     % No-passing zones       20      %
       Up/down      -      %      Access point density     8       /mi

Analysis direction volume, Vd  653     veh/h
Opposing direction volume, Vo  242     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1               1.4
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.977
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi         714     pc/h       269     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0      mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.6     mi/h
Average travel speed, ATSd               48.8    mi/h
Percent Free Flow Speed, PFFS              84.1    %




__________________________Percent Time-Spent-Following__________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.0               1.1
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        710    pc/h         265     pc/h
Base percent time-spent-following,(note-4) BPTSFd  59.8   %
Adjustment for no-passing zones, fnp              19.5
Percent time-spent-following, PTSFd               74.0   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                          B
Volume to capacity ratio, v/c                    0.42
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1661    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                        1661    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                     0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                  48.8    mi/h
Percent time-spent-following, PTSFd (from above)            74.0
Level of service, LOSd (from above)                        B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0      %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                   -
Percent time-spent-following
    including passing lane, PTSFpl                        -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking        0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          709.8
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                 3.81
Bicycle LOS                                       D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year          2040
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level         % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
      Up/down        -       %      Access point density     8      /mi

Analysis direction volume, Vd  441     veh/h
Opposing direction volume, Vo  803     veh/h

___________________________Average Travel Speed______________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.2               1.0
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.988              1.000
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi        485     pc/h       873     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.6     mi/h
Average travel speed, ATSd                 46.9    mi/h
Percent Free Flow Speed, PFFS               80.9    %




_______________________Percent Time-Spent-Following_______________________

Direction                    Analysis(d)       Opposing (o)
PCE for trucks, ET                  1.0              1.0
PCE for RVs, ER                     1.0              1.0
Heavy-vehicle adjustment factor, fHV      1.000             1.000
Grade adjustment factor,(note-1) fg       1.00              1.00
Directional flow rate,(note-2) vi        479    pc/h        873     pc/h
Base percent time-spent-following,(note-4) BPTSFd  54.2   %
Adjustment for no-passing zones, fnp              17.7
Percent time-spent-following, PTSFd               60.5   %

_______________Level of Service and Other Performance Measures______________

Level of service, LOS                        C
Volume to capacity ratio, v/c                  0.29
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                       1700    veh/h
Capacity from PTSF, CdPTSF                      1700    veh/h
Directional Capacity                         1700    veh/h

___________________________Passing Lane Analysis__________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                  46.9    mi/h
Percent time-spent-following, PTSFd (from above)            60.5
Level of service, LOSd (from above)                       C

__________________Average Travel Speed  with Passing Lane__________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                      -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_______________Percent Time-Spent-Following with Passing Lane_______________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                 -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                         479.3
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.61
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                      Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2040
Description  Community College Expansion

___________________________________Input Data___________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width       6.0    ft     % Trucks and buses       6       %
Lane width          12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0    mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level         % Recreational vehicles  4       %
Grade:  Length       -      mi     % No-passing zones       20      %
        Up/down      -      %      Access point density     8       /mi

Analysis direction volume, Vd  431     veh/h
Opposing direction volume, Vo  683     veh/h

____________________________Average Travel Speed_______________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.2               1.1
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.988              0.994
Grade adj. factor,(note-1) fg          1.00              1.00
Directional flow rate,(note-2) vi         474     pc/h       747     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                       58.0    mi/h

Adjustment for no-passing zones, fnp           0.7     mi/h
Average travel speed, ATSd                  47.8    mi/h
Percent Free Flow Speed, PFFS                82.5    %




______________________________Percent Time-Spent-Following______________________________

Direction                       Analysis(d)         Opposing (o)
PCE for trucks, ET                     1.0                1.0
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV       1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         468    pc/h         742     pc/h
Base percent time-spent-following,(note-4) BPTSFd  52.9   %
Adjustment for no-passing zones, fnp              21.3
Percent time-spent-following, PTSFd               61.1   %

___________________Level of Service and Other Performance Measures__________________

Level of service, LOS                       C
Volume to capacity ratio, v/c                   0.28
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                       1690    veh/h

___________________________________Passing Lane Analysis___________________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    47.8    mi/h
Percent time-spent-following, PTSFd (from above)            61.1
Level of service, LOSd (from above)                        C

______________________Average Travel Speed  with Passing Lane______________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                             -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

___________________Percent Time-Spent-Following with Passing Lane__________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking        0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                         468.5
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.60
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                    Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.            R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway               Bush Street
From/To               Semas Dr/Belle Haven Dr
Jurisdiction          Kings County
Analysis Year          2040
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6       %
Lane width         12.0    ft    % Trucks crawling        0.0     %
Segment length      0.0    mi    Truck crawl speed        0.0     mi/hr
Terrain type        Level        % Recreational vehicles  4       %
Grade:  Length       -     mi    % No-passing zones       20      %
      Up/down       -      %     Access point density     8       /mi

Analysis direction volume, Vd  279     veh/h
Opposing direction volume, Vo  857     veh/h

____________________________Average Travel Speed______________________________

Direction                       Analysis(d)       Opposing (o)
PCE for trucks, ET                   1.4              1.0
PCE for RVs, ER                      1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977            1.000
Grade adj. factor,(note-1) fg           1.00             1.00
Directional flow rate,(note-2) vi        310     pc/h       932     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS           60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.6     mi/h
Average travel speed, ATSd                  47.8    mi/h
Percent Free Flow Speed, PFFS                82.4    %




__________________________Percent Time-Spent-Following__________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1                1.0
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         305    pc/h        932     pc/h
Base percent time-spent-following,(note-4) BPTSFd  42.5   %
Adjustment for no-passing zones, fnp             14.6
Percent time-spent-following, PTSFd              46.1   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                       C
Volume to capacity ratio, v/c                 0.18
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1700    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                        1700    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                     0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                  47.8    mi/h
Percent time-spent-following, PTSFd (from above)            46.1
Level of service, LOSd (from above)                        C

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15              -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                           55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                        303.3
Effective width of outside lane, We                     24.00
Effective speed factor, St                       4.79
Bicycle LOS Score, BLOS                              3.38
Bicycle LOS                                  C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: AM
Highway:        Bush Street
From/To:        SR 41 NB/N 19 1/2 Ave
Jurisdiction:   Kings County
Analysis Year:  2040
Project ID:     Community College Expansion

_______________________________FREE-FLOW SPEED_________________________________

            Direction        1             2
Lane width                   12.0    ft    12.0    ft
Lateral clearance:
   Right edge                6.0     ft    6.0     ft
   Left edge                 6.0     ft    6.0     ft
   Total lateral clearance   12.0    ft    12.0    ft
Access points per mile       0             0
Median type
Free-flow speed:             Measured      Measured
   FFS or BFFS               55.0    mph   55.0    mph
Lane width adjustment, FLW          0.0     mph    0.0     mph
Lateral clearance adjustment, FLC   0.0     mph    0.0     mph
Median type adjustment, FM          0.0     mph    0.0     mph
Access points adjustment, FA        0.0     mph    0.0     mph
Free-flow speed              55.0    mph   55.0    mph

____________________________________VOLUME_____________________________________

            Direction        1             2
Volume, V                    421     vph   1232    vph
Peak-hour factor, PHF        0.92          0.92
Peak 15-minute volume, v15   114           335
Trucks and buses             5       %     5       %
Recreational vehicles        0       %     0       %
Terrain type                 Level         Level
   Grade                     0.00    %     0.00    %
   Segment length            0.00    mi    0.00    mi
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```
Number of lanes                    2                  2
Driver population adjustment, fP     1.00               1.00
Trucks and buses PCE, ET           1.5                1.5
Recreational vehicles PCE, ER       1.2                1.2
Heavy vehicle adjustment, fHV       0.976              0.976
Flow rate, vp                    234       pcphpl   686       pcphpl

______________________________________RESULTS______________________________________

               Direction          1                  2
Flow rate, vp                    234       pcphpl   686       pcphpl
Free-flow speed, FFS                55.0      mph       55.0      mph
Avg. passenger-car travel speed, S   55.0      mph       55.0      mph
Level of service, LOS               A                  B
Density, D                       4.3       pc/mi/ln 12.5      pc/mi/ln

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp              55                 55
Percent of segment with occupied
on-highway parking                  0                  0
Pavement rating, P                  3                  3
Flow rate in outside lane, vOL       228.8              669.6
Effective width of outside lane, We  24.00              24.00
Effective speed factor, St          4.79               4.79
Bicycle LOS Score, BLOS              2.93               3.47
Bicycle LOS                        C                  C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                        Fax:
E-mail:

____________________________OPERATIONAL ANALYSIS_________________________________

Analyst:      Shalisha Hodson
Agency/Co:     R&S Civil
Date:         12/18/2020
Analysis Period: AM
Highway:       Bush Street
From/To:       SR 41 SB/SR 41 NB
Jurisdiction:   Kings County
Analysis Year:  2040
Project ID:     Community College Expansion

________________________________FREE-FLOW SPEED__________________________________

           Direction        1           2
Lane width                 12.0    ft     12.0    ft
Lateral clearance:
   Right edge              6.0     ft     6.0     ft
   Left edge               6.0     ft     6.0     ft
   Total lateral clearance     12.0    ft     12.0    ft
Access points per mile        0           0
Median type
Free-flow speed:            Measured        Measured
   FFS or BFFS              55.0    mph    55.0    mph
Lane width adjustment, FLW       0.0     mph    0.0     mph
Lateral clearance adjustment, FLC   0.0     mph    0.0     mph
Median type adjustment, FM       0.0     mph    0.0     mph
Access points adjustment, FA      0.0     mph    0.0     mph
Free-flow speed             55.0    mph    55.0    mph

_____________________________________VOLUME_______________________________________

           Direction        1           2
Volume, V                  352     vph    1121    vph
Peak-hour factor, PHF          0.92          0.92
Peak 15-minute volume, v15        96           305
Trucks and buses              5       %      5       %
Recreational vehicles          0       %      0       %
Terrain type               Level          Level
   Grade                   0.00     %     0.00     %
   Segment length             0.00    mi     0.00    mi
```

```
Number of lanes                    2                2
Driver population adjustment, fP     1.00             1.00
Trucks and buses PCE, ET           1.5              1.5
Recreational vehicles PCE, ER       1.2              1.2
Heavy vehicle adjustment, fHV       0.976            0.976
Flow rate, vp                  196      pcphpl   624      pcphpl

___________________________________RESULTS___________________________________

                  Direction          1                2
Flow rate, vp                  196      pcphpl   624      pcphpl
Free-flow speed, FFS               55.0      mph      55.0      mph
Avg. passenger-car travel speed, S   55.0      mph      55.0      mph
Level of service, LOS              A                B
Density, D                     3.6      pc/mi/ln 11.3      pc/mi/ln

_________________________ Bicycle Level of Service _________________________

Posted speed limit, Sp             55               55
Percent of segment with occupied
on-highway parking                 0                0
Pavement rating, P                 3                3
Flow rate in outside lane, vOL       191.3            609.2
Effective width of outside lane, We  24.00            24.00
Effective speed factor, St          4.79             4.79
Bicycle LOS Score, BLOS             2.84             3.42
Bicycle LOS                     C                C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year           2040
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
      Up/down        -       %      Access point density     8       /mi

Analysis direction volume, Vd  803     veh/h
Opposing direction volume, Vo  441     veh/h

___________________________Average Travel Speed______________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.0                1.2
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    1.000              0.988
Grade adj. factor,(note-1) fg             1.00               1.00
Directional flow rate,(note-2) vi          873     pc/h       485     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp         1.2     mi/h
Average travel speed, ATSd                 46.2    mi/h
Percent Free Flow Speed, PFFS               79.7    %




__________________________Percent Time-Spent-Following__________________________

Direction                    Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.0              1.0
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adjustment factor, fHV      1.000             1.000
Grade adjustment factor,(note-1) fg       1.00              1.00
Directional flow rate,(note-2) vi        873    pc/h        479     pc/h
Base percent time-spent-following,(note-4) BPTSFd  68.9   %
Adjustment for no-passing zones, fnp             17.7
Percent time-spent-following, PTSFd              80.3   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         C
Volume to capacity ratio, v/c                    0.51
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60          0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                        1680    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                         1680    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                     0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    46.2    mi/h
Percent time-spent-following, PTSFd (from above)            80.3
Level of service, LOSd (from above)                        C

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
```

```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                          872.8
Effective width of outside lane, We                       24.00
Effective speed factor, St                         4.79
Bicycle LOS Score, BLOS                                3.92
Bicycle LOS                                      D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    AM
Highway                 Bush Street
From/To                 College Ave/Semas Dr
Jurisdiction            Kings County
Analysis Year           2040
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses      6      %
Lane width         12.0    ft    % Trucks crawling       0.0    %
Segment length      0.0    mi    Truck crawl speed       0.0    mi/hr
Terrain type        Level        % Recreational vehicles  4     %
Grade:  Length      -      mi    % No-passing zones      20     %
        Up/down     -      %     Access point density     8     /mi

Analysis direction volume, Vd  683     veh/h
Opposing direction volume, Vo          veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)       Opposing (o)
PCE for trucks, ET                     1.1               1.1
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994             0.994
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi        747     pc/h      747     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp           0.7     mi/h
Average travel speed, ATSd                45.7    mi/h
Percent Free Flow Speed, PFFS               78.8    %




_________________________Percent Time-Spent-Following_________________________

Direction                     Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.0              1.0
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adjustment factor, fHV      1.000             1.000
Grade adjustment factor,(note-1) fg      1.00              1.00
Directional flow rate,(note-2) vi        742    pc/h        742     pc/h
Base percent time-spent-following,(note-4) BPTSFd  67.1   %
Adjustment for no-passing zones, fnp              19.1
Percent time-spent-following, PTSFd               76.7   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          C
Volume to capacity ratio, v/c                    0.44
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                       1690    veh/h

____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                  45.7    mi/h
Percent time-spent-following, PTSFd (from above)            76.7
Level of service, LOSd (from above)                         C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
```

```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                          55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                             3
Flow rate in outside lane, vOL                     742.4
Effective width of outside lane, We                  24.00
Effective speed factor, St                       4.79
Bicycle LOS Score, BLOS                            3.84
Bicycle LOS                                   D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2040
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Specific Grade % Recreational vehicles  4       %
Grade:  Length       0.25    mi     % No-passing zones       20      %
       Up/down       3.0     %      Access point density     8       /mi

Analysis direction volume, Vd  857     veh/h
Opposing direction volume, Vo  279     veh/h

____________________________Average Travel Speed______________________________

Direction                          Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1                1.4
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.977
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi        937     pc/h       311     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM               -      mi/h
Observed total demand,(note-3) V                 -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                        58.0    mi/h

Adjustment for no-passing zones, fnp           1.5     mi/h
Average travel speed, ATSd                   46.8    mi/h
Percent Free Flow Speed, PFFS                  80.7    %




_________________________Percent Time-Spent-Following_________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.0                1.1
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       0.92               1.00
Directional flow rate,(note-2) vi        1013   pc/h         305     pc/h
Base percent time-spent-following,(note-4) BPTSFd  71.7   %
Adjustment for no-passing zones, fnp              13.4
Percent time-spent-following, PTSFd               82.0   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          C
Volume to capacity ratio, v/c                    0.55
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                         1373    veh/h
Capacity from PTSF, CdPTSF                        1648    veh/h
Directional Capacity                         1373    veh/h

_____________________________Passing Lane Analysis_____________________________

Total length of analysis segment, Lt                    0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                  46.8    mi/h
Percent time-spent-following, PTSFd (from above)             82.0
Level of service, LOSd (from above)                       C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                   -
Percent time-spent-following
    including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                        931.5
Effective width of outside lane, We                     24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.95
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                    Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year          2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses      6      %
Lane width          12.0    ft    % Trucks crawling       0.0     %
Segment length      0.0    mi    Truck crawl speed       0.0     mi/hr
Terrain type        Level        % Recreational vehicles  4      %
Grade:  Length      -      mi    % No-passing zones      20      %
      Up/down      -      %      Access point density     8      /mi

Analysis direction volume, Vd  460     veh/h
Opposing direction volume, Vo  880     veh/h

____________________________Average Travel Speed______________________________

Direction                      Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.2              1.0
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.988              1.000
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi        506     pc/h       957     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM            -     mi/h
Observed total demand,(note-3) V             -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS           60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.6     mi/h
Average travel speed, ATSd                 46.1    mi/h
Percent Free Flow Speed, PFFS                79.5    %




__________________________Percent Time-Spent-Following__________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.0                1.0
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        500    pc/h         957     pc/h
Base percent time-spent-following,(note-4) BPTSFd  56.6   %
Adjustment for no-passing zones, fnp              16.0
Percent time-spent-following, PTSFd               62.1   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         C
Volume to capacity ratio, v/c                   0.30
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                        1700    veh/h
Capacity from PTSF, CdPTSF                      1700    veh/h
Directional Capacity                         1700    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                  46.1    mi/h
Percent time-spent-following, PTSFd (from above)            62.1
Level of service, LOSd (from above)                         C

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Ld e    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                         500.0
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.64
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                 Bush Street
From/To                 College Ave/Semas Dr
Jurisdiction            Kings County
Analysis Year           2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length        -      mi     % No-passing zones       20      %
      Up/down         -      %      Access point density     8       /mi

Analysis direction volume, Vd  452     veh/h
Opposing direction volume, Vo  769     veh/h

____________________________Average Travel Speed______________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.2               1.1
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.988              0.994
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi        497     pc/h       841     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -     mi/h
Observed total demand,(note-3) V                -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.6     mi/h
Average travel speed, ATSd                  47.1    mi/h
Percent Free Flow Speed, PFFS                81.1    %




_____________________________Percent Time-Spent-Following_____________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.0               1.0
PCE for RVs, ER                         1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         491    pc/h         836     pc/h
Base percent time-spent-following,(note-4) BPTSFd  55.0   %
Adjustment for no-passing zones, fnp              18.7
Percent time-spent-following, PTSFd               61.9   %

__________________Level of Service and Other Performance Measures_________________

Level of service, LOS                       C
Volume to capacity ratio, v/c                 0.29
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60          0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                        1690    veh/h

_________________________________Passing Lane Analysis________________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                   47.1    mi/h
Percent time-spent-following, PTSFd (from above)            61.9
Level of service, LOSd (from above)                        C

_____________________Average Travel Speed  with Passing Lane_____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

__________________Percent Time-Spent-Following with Passing Lane_________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                   -
Percent time-spent-following
    including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                        491.3
Effective width of outside lane, We                    24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              3.63
Bicycle LOS                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                      Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width      6.0     ft     % Trucks and buses       6       %
Lane width         12.0     ft     % Trucks crawling        0.0     %
Segment length      0.0     mi      Truck crawl speed        0.0     mi/hr
Terrain type        Specific Grade % Recreational vehicles  4       %
Grade:  Length      0.25    mi     % No-passing zones       20      %
      Up/down       3.0     %      Access point density     8       /mi

Analysis direction volume, Vd  300     veh/h
Opposing direction volume, Vo  943     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                      2.3               1.0
PCE for RVs, ER                         1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.929               1.000
Grade adj. factor,(note-1) fg           0.88              1.00
Directional flow rate,(note-2) vi         399     pc/h        1025    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.6     mi/h
Average travel speed, ATSd                  46.4    mi/h
Percent Free Flow Speed, PFFS                80.0    %




__________________________Percent Time-Spent-Following__________________________

Direction                       Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV       1.000               1.000
Grade adjustment factor,(note-1) fg       0.97                1.00
Directional flow rate,(note-2) vi         337    pc/h         1025    pc/h
Base percent time-spent-following,(note-4) BPTSFd  46.2   %
Adjustment for no-passing zones, fnp              12.6
Percent time-spent-following, PTSFd               49.3   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                           C
Volume to capacity ratio, v/c                     0.23
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1564    veh/h
Directional Capacity                            1690    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      46.4    mi/h
Percent time-spent-following, PTSFd (from above)             49.3
Level of service, LOSd (from above)                          C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                         326.1
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.42
Bicycle LOS                                       C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                          Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:       Shalisha Hodson
Agency/Co:       R&S Civil
Date:          12/18/2020
Analysis Period: AM
Highway:        Bush Street
From/To:        SR 41 NB/N 19 1/2 Ave
Jurisdiction:    Kings County
Analysis Year:   2040+Project
Project ID:      Community College Expansion

_______________________________FREE-FLOW SPEED__________________________________

             Direction          1            2
Lane width                      12.0    ft      12.0    ft
Lateral clearance:
   Right edge                  6.0     ft      6.0     ft
   Left edge                  6.0     ft      6.0     ft
   Total lateral clearance         12.0    ft      12.0    ft
Access points per mile            0             0
Median type
Free-flow speed:                  Measured         Measured
   FFS or BFFS                    55.0    mph     55.0    mph
Lane width adjustment, FLW          0.0      mph     0.0      mph
Lateral clearance adjustment, FLC    0.0      mph     0.0      mph
Median type adjustment, FM          0.0      mph     0.0      mph
Access points adjustment, FA        0.0      mph     0.0      mph
Free-flow speed                   55.0    mph     55.0    mph

____________________________________VOLUME_____________________________________

             Direction          1            2
Volume, V                       435     vph     1289    vph
Peak-hour factor, PHF              0.92          0.92
Peak 15-minute volume, v15          118              350
Trucks and buses                  5       %       5       %
Recreational vehicles              0       %       0       %
Terrain type                    Level            Level
   Grade                      0.00     %      0.00     %
   Segment length                0.00     mi     0.00     mi
```

```
Number of lanes                    2              2
Driver population adjustment, fP     1.00           1.00
Trucks and buses PCE, ET            1.5            1.5
Recreational vehicles PCE, ER       1.2            1.2
Heavy vehicle adjustment, fHV       0.976          0.976
Flow rate, vp                     242      pcphpl   718      pcphpl

____________________________________RESULTS____________________________________

               Direction          1              2
Flow rate, vp                     242      pcphpl   718      pcphpl
Free-flow speed, FFS               55.0     mph     55.0     mph
Avg. passenger-car travel speed, S   55.0     mph     55.0     mph
Level of service, LOS              A               B
Density, D                        4.4      pc/mi/ln 13.1     pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp             55              55
Percent of segment with occupied
on-highway parking                  0               0
Pavement rating, P                  3               3
Flow rate in outside lane, vOL       236.4           700.5
Effective width of outside lane, We  24.00           24.00
Effective speed factor, St          4.79            4.79
Bicycle LOS Score, BLOS              2.94            3.49
Bicycle LOS                       C               C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                         Fax:
E-mail:

_____________________________OPERATIONAL ANALYSIS__________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: AM
Highway:        Bush Street
From/To:        SR 41 SB/SR 41 NB
Jurisdiction:   Kings County
Analysis Year:  2040+Project
Project ID:     Community College Expansion

_________________________________FREE-FLOW SPEED___________________________________

           Direction          1              2
Lane width                   12.0     ft     12.0     ft
Lateral clearance:
   Right edge                6.0      ft     6.0      ft
   Left edge                 6.0      ft     6.0      ft
   Total lateral clearance   12.0     ft     12.0     ft
Access points per mile       0               0
Median type
Free-flow speed:             Measured        Measured
   FFS or BFFS               55.0     mph    55.0     mph
Lane width adjustment, FLW           0.0      mph    0.0      mph
Lateral clearance adjustment, FLC    0.0      mph    0.0      mph
Median type adjustment, FM           0.0      mph    0.0      mph
Access points adjustment, FA         0.0      mph    0.0      mph
Free-flow speed              55.0     mph    55.0     mph

______________________________________VOLUME_______________________________________

           Direction          1              2
Volume, V                    374      vph    1191     vph
Peak-hour factor, PHF        0.92            0.92
Peak 15-minute volume, v15   102             324
Trucks and buses             5        %      5        %
Recreational vehicles        0        %      0        %
Terrain type                 Level           Level
   Grade                     0.00     %      0.00     %
   Segment length            0.00     mi     0.00     mi
```

```
Number of lanes                  2              2
Driver population adjustment, fP     1.00            1.00
Trucks and buses PCE, ET           1.5             1.5
Recreational vehicles PCE, ER       1.2             1.2
Heavy vehicle adjustment, fHV       0.976           0.976
Flow rate, vp                   208      pcphpl   663      pcphpl

___________________________________RESULTS___________________________________

               Direction          1              2
Flow rate, vp                   208      pcphpl   663      pcphpl
Free-flow speed, FFS              55.0     mph      55.0     mph
Avg. passenger-car travel speed, S   55.0     mph      55.0     mph
Level of service, LOS             A              B
Density, D                      3.8      pc/mi/ln 12.1     pc/mi/ln

_________________________ Bicycle Level of Service _________________________

Posted speed limit, Sp            55             55
Percent of segment with occupied
on-highway parking                0              0
Pavement rating, P                3              3
Flow rate in outside lane, vOL       203.3           647.3
Effective width of outside lane, We  24.00           24.00
Effective speed factor, St          4.79            4.79
Bicycle LOS Score, BLOS              2.87            3.45
Bicycle LOS                       C              C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-Mail:

________________Directional Two-Lane Highway Segment Analysis_______________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year          2040+Project
Description  Community College Expansion

________________________________Input Data________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
      Up/down        -       %      Access point density     8       /mi

Analysis direction volume, Vd  880     veh/h
Opposing direction volume, Vo  460     veh/h

__________________________Average Travel Speed____________________________

Direction                        Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.0              1.2
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    1.000            0.988
Grade adj. factor,(note-1) fg            1.00             1.00
Directional flow rate,(note-2) vi        957     pc/h       506     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.2     mi/h
Average travel speed, ATSd                  45.5    mi/h
Percent Free Flow Speed, PFFS                78.4    %




_________________________Percent Time-Spent-Following_________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.0               1.0
PCE for RVs, ER                         1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         957     pc/h         500     pc/h
Base percent time-spent-following,(note-4) BPTSFd  71.8   %
Adjustment for no-passing zones, fnp              16.0
Percent time-spent-following, PTSFd               82.3   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                           C
Volume to capacity ratio, v/c                     0.56
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1680    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                          1680    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl                -        mi
Average travel speed, ATSd (from above)                    45.5    mi/h
Percent time-spent-following, PTSFd (from above)            82.3
Level of service, LOSd (from above)                        C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -        mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -        mi
Adj. factor for the effect of passing lane
   on average speed, fpl                                  -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0      %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                 -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                           55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                     956.5
Effective width of outside lane, We                  24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                            3.96
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    AM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0    ft    % Trucks and buses       6       %
Lane width          12.0    ft    % Trucks crawling        0.0     %
Segment length       0.0    mi    Truck crawl speed        0.0     mi/hr
Terrain type        Level         % Recreational vehicles  4       %
Grade:  Length       -      mi    % No-passing zones       20      %
     Up/down       -     %      Access point density     8       /mi

Analysis direction volume, Vd  769     veh/h
Opposing direction volume, Vo          veh/h

____________________________Average Travel Speed______________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1                1.1
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.994
Grade adj. factor,(note-1) fg             1.00               1.00
Directional flow rate,(note-2) vi         841     pc/h       841     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.6     mi/h
Average travel speed, ATSd                  44.4    mi/h
Percent Free Flow Speed, PFFS                76.5    %




_________________________Percent Time-Spent-Following_________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.0                1.0
PCE for RVs, ER                          1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         836     pc/h         836     pc/h
Base percent time-spent-following,(note-4) BPTSFd  71.1   %
Adjustment for no-passing zones, fnp              17.1
Percent time-spent-following, PTSFd               79.7   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                           C
Volume to capacity ratio, v/c                    0.49
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60          0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                      1700    veh/h
Directional Capacity                          1690    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                    0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    44.4    mi/h
Percent time-spent-following, PTSFd (from above)             79.7
Level of service, LOSd (from above)                         C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                 -
Percent time-spent-following
   including passing lane, PTSFpl                     -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                          55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                             3
Flow rate in outside lane, vOL                      835.9
Effective width of outside lane, We                   24.00
Effective speed factor, St                       4.79
Bicycle LOS Score, BLOS                            3.90
Bicycle LOS                                 D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
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Phone:                      Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.            R&S Civil
Date Performed        12/14/2020
Analysis Time Period  AM
Highway               Bush Street
From/To               Semas Dr/Belle Haven Dr
Jurisdiction          Kings County
Analysis Year         2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses      6      %
Lane width         12.0    ft    % Trucks crawling       0.0    %
Segment length      0.0    mi    Truck crawl speed       0.0    mi/hr
Terrain type        Specific Grade % Recreational vehicles  4      %
Grade:  Length      0.25   mi    % No-passing zones      20     %
        Up/down     3.0    %     Access point density    8      /mi

Analysis direction volume, Vd  943     veh/h
Opposing direction volume, Vo  300     veh/h

____________________________Average Travel Speed______________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.1               1.4
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994             0.977
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi        1031    pc/h        334     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM            -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                        58.0    mi/h

Adjustment for no-passing zones, fnp           1.5     mi/h
Average travel speed, ATSd                   45.9    mi/h
Percent Free Flow Speed, PFFS                  79.2    %




___________________________Percent Time-Spent-Following___________________________

Direction                     Analysis(d)        Opposing (o)
PCE for trucks, ET                  1.0               1.1
PCE for RVs, ER                     1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       0.92              1.00
Directional flow rate,(note-2) vi        1114   pc/h         328     pc/h
Base percent time-spent-following,(note-4) BPTSFd  75.3   %
Adjustment for no-passing zones, fnp              11.8
Percent time-spent-following, PTSFd               84.4   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                        C
Volume to capacity ratio, v/c                   0.61
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1390    veh/h
Capacity from PTSF, CdPTSF                        1644    veh/h
Directional Capacity                         1390    veh/h

_______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                  45.9    mi/h
Percent time-spent-following, PTSFd (from above)            84.4
Level of service, LOSd (from above)                        C

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

_________________________ Bicycle Level of Service _________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                       1025.0
Effective width of outside lane, We                    24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              4.00
Bicycle LOS                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
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Phone:                    Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year          2020
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
     Up/down         -       %      Access point density     8       /mi

Analysis direction volume, Vd  344     veh/h
Opposing direction volume, Vo  292     veh/h

____________________________Average Travel Speed______________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.3               1.4
PCE for RVs, ER                         1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982              0.977
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi        381     pc/h       325     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM            -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.5     mi/h
Average travel speed, ATSd                 51.0    mi/h
Percent Free Flow Speed, PFFS                88.0    %




_________________________Percent Time-Spent-Following_________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.1               1.1
PCE for RVs, ER                          1.0               1.0
Heavy-vehicle adjustment factor, fHV      0.994              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         376    pc/h        319     pc/h
Base percent time-spent-following,(note-4) BPTSFd  39.9   %
Adjustment for no-passing zones, fnp              34.7
Percent time-spent-following, PTSFd               58.7   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         B
Volume to capacity ratio, v/c                   0.22
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                        1661    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                         1661    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl               -       mi
Average travel speed, ATSd (from above)                    51.0    mi/h
Percent time-spent-following, PTSFd (from above)            58.7
Level of service, LOSd (from above)                        B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -      mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -      mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                   -
Percent time-spent-following
    including passing lane, PTSFpl                       -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -      veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                               55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          373.9
Effective width of outside lane, We                       24.00
Effective speed factor, St                           4.79
Bicycle LOS Score, BLOS                                3.49
Bicycle LOS                                      C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway                 Bush Street
From/To                 College Ave/Semas Dr
Jurisdiction            Kings County
Analysis Year           2020
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3             Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
        Up/down      -       %      Access point density     8       /mi

Analysis direction volume, Vd  264     veh/h
Opposing direction volume, Vo  512     veh/h

____________________________Average Travel Speed_______________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.4               1.1
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV   0.977          0.994
Grade adj. factor,(note-1) fg          1.00             1.00
Directional flow rate,(note-2) vi       294     pc/h       560     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.1     mi/h
Average travel speed, ATSd                   50.3    mi/h
Percent Free Flow Speed, PFFS                  86.7    %




__________________________Percent Time-Spent-Following__________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1               1.0
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         289    pc/h         557     pc/h
Base percent time-spent-following,(note-4) BPTSFd  36.6   %
Adjustment for no-passing zones, fnp              24.8
Percent time-spent-following, PTSFd               45.1   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                        B
Volume to capacity ratio, v/c                   0.17
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0    veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                         1690    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                      50.3    mi/h
Percent time-spent-following, PTSFd (from above)             45.1
Level of service, LOSd (from above)                          B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                           55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                             3
Flow rate in outside lane, vOL                     287.0
Effective width of outside lane, We                  24.00
Effective speed factor, St                       4.79
Bicycle LOS Score, BLOS                           3.35
Bicycle LOS                                  C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                         Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year           2020
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0      mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
     Up/down      -       %      Access point density     8       /mi

Analysis direction volume, Vd  264     veh/h
Opposing direction volume, Vo  222     veh/h

____________________________Average Travel Speed_______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.4                1.5
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.971
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi         294     pc/h       249     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0      mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                      58.0    mi/h

Adjustment for no-passing zones, fnp          1.6     mi/h
Average travel speed, ATSd                  52.1    mi/h
Percent Free Flow Speed, PFFS                 89.9    %



_________________________Percent Time-Spent-Following_________________________

Direction                        Analysis(d)         Opposing (o)
PCE for trucks, ET                     1.1                 1.1
PCE for RVs, ER                        1.0                 1.0
Heavy-vehicle adjustment factor, fHV      0.994               0.994
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         289    pc/h         243     pc/h
Base percent time-spent-following,(note-4) BPTSFd  31.1   %
Adjustment for no-passing zones, fnp              38.1
Percent time-spent-following, PTSFd               51.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.17
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                        1651    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                         1651    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                      52.1    mi/h
Percent time-spent-following, PTSFd (from above)             51.8
Level of service, LOSd (from above)                          B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15              -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                         287.0
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.35
Bicycle LOS                                     C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                         Fax:
E-mail:

_____________________________OPERATIONAL ANALYSIS__________________________________

Analyst:       Shalisha Hodson
Agency/Co:       R&S Civil
Date:          12/18/2020
Analysis Period: PM
Highway:        Bush Street
From/To:        SR 41 NB/N 19 1/2 Ave
Jurisdiction:    Kings County
Analysis Year:   2020
Project ID:      Community College Expansion

___________________________________FREE-FLOW SPEED__________________________________

              Direction          1               2
Lane width                    12.0     ft      12.0     ft
Lateral clearance:
   Right edge                 6.0      ft      6.0      ft
   Left edge                  6.0      ft      6.0      ft
   Total lateral clearance        12.0     ft      12.0     ft
Access points per mile            0               0
Median type
Free-flow speed:              Measured         Measured
   FFS or BFFS                55.0     mph     55.0     mph
Lane width adjustment, FLW         0.0      mph     0.0      mph
Lateral clearance adjustment, FLC   0.0      mph     0.0      mph
Median type adjustment, FM         0.0      mph     0.0      mph
Access points adjustment, FA       0.0      mph     0.0      mph
Free-flow speed               55.0     mph     55.0     mph

_________________________________________VOLUME__________________________________________

              Direction          1               2
Volume, V                     534      vph     338      vph
Peak-hour factor, PHF             0.92             0.92
Peak 15-minute volume, v15        145              92
Trucks and buses                  5        %       5        %
Recreational vehicles             0        %       0        %
Terrain type                  Level            Level
   Grade                      0.00     %       0.00     %
   Segment length                 0.00     mi      0.00     mi
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```
Number of lanes                    2               2
Driver population adjustment, fP     1.00            1.00
Trucks and buses PCE, ET           1.5             1.5
Recreational vehicles PCE, ER       1.2             1.2
Heavy vehicle adjustment, fHV       0.976           0.976
Flow rate, vp                   297      pcphpl   188      pcphpl

_______________________________RESULTS_______________________________

             Direction          1               2
Flow rate, vp                   297      pcphpl   188      pcphpl
Free-flow speed, FFS                55.0     mph      55.0     mph
Avg. passenger-car travel speed, S   55.0     mph      55.0     mph
Level of service, LOS               A               A
Density, D                      5.4      pc/mi/ln 3.4      pc/mi/ln

______________________ Bicycle Level of Service ______________________

Posted speed limit, Sp              55              55
Percent of segment with occupied
on-highway parking                  0               0
Pavement rating, P                  3               3
Flow rate in outside lane, vOL       290.2           183.7
Effective width of outside lane, We  24.00           24.00
Effective speed factor, St          4.79            4.79
Bicycle LOS Score, BLOS              3.05            2.82
Bicycle LOS                         C               C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-mail:

____________________________OPERATIONAL ANALYSIS_________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: PM
Highway:        Bush Street
From/To:        SR 41 SB/SR 41 NB
Jurisdiction:   Kings County
Analysis Year:  2020
Project ID:     Community College Expansion

________________________________FREE-FLOW SPEED___________________________________

            Direction          1              2
Lane width                    12.0     ft     12.0     ft
Lateral clearance:
   Right edge                 6.0      ft     6.0      ft
   Left edge                  6.0      ft     6.0      ft
   Total lateral clearance    12.0     ft     12.0     ft
Access points per mile        0               0
Median type
Free-flow speed:              Measured        Measured
   FFS or BFFS                55.0     mph    55.0     mph
Lane width adjustment, FLW          0.0      mph    0.0      mph
Lateral clearance adjustment, FLC   0.0      mph    0.0      mph
Median type adjustment, FM          0.0      mph    0.0      mph
Access points adjustment, FA        0.0      mph    0.0      mph
Free-flow speed               55.0     mph    55.0     mph

_____________________________________VOLUME_______________________________________

            Direction          1              2
Volume, V                     341      vph    355      vph
Peak-hour factor, PHF         0.92            0.92
Peak 15-minute volume, v15    93              96
Trucks and buses              5        %      5        %
Recreational vehicles         0        %      0        %
Terrain type                  Level           Level
   Grade                      0.00     %      0.00     %
   Segment length             0.00     mi     0.00     mi
```

```
Number of lanes                    2              2
Driver population adjustment, fP    1.00           1.00
Trucks and buses PCE, ET            1.5            1.5
Recreational vehicles PCE, ER       1.2            1.2
Heavy vehicle adjustment, fHV       0.976          0.976
Flow rate, vp                      189     pcphpl   197     pcphpl

____________________________________RESULTS____________________________________

             Direction            1              2
Flow rate, vp                      189     pcphpl   197     pcphpl
Free-flow speed, FFS               55.0    mph      55.0    mph
Avg. passenger-car travel speed, S  55.0    mph      55.0    mph
Level of service, LOS              A              A
Density, D                         3.4     pc/mi/ln 3.6     pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp             55             55
Percent of segment with occupied
on-highway parking                 0              0
Pavement rating, P                 3              3
Flow rate in outside lane, vOL     185.3          192.9
Effective width of outside lane, We 24.00          24.00
Effective speed factor, St         4.79           4.79
Bicycle LOS Score, BLOS            2.82           2.84
Bicycle LOS                        C              C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                        Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year          2020
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
       Up/down       -       %      Access point density     8       /mi

Analysis direction volume, Vd  292     veh/h
Opposing direction volume, Vo  344     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)         Opposing (o)
PCE for trucks, ET                      1.4               1.3
PCE for RVs, ER                         1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977             0.982
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi        325     pc/h       381     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.4     mi/h
Average travel speed, ATSd                   51.1    mi/h
Percent Free Flow Speed, PFFS                 88.1    %




_____________________________Percent Time-Spent-Following_____________________________

Direction                          Analysis(d)         Opposing (o)
PCE for trucks, ET                       1.1                 1.1
PCE for RVs, ER                          1.0                 1.0
Heavy-vehicle adjustment factor, fHV      0.994              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         319    pc/h        376     pc/h
Base percent time-spent-following,(note-4) BPTSFd  35.9   %
Adjustment for no-passing zones, fnp              34.7
Percent time-spent-following, PTSFd               51.8   %

___________________Level of Service and Other Performance Measures_________________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.19
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60          0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1669    veh/h
Capacity from PTSF, CdPTSF                      1690    veh/h
Directional Capacity                         1669    veh/h

__________________________________Passing Lane Analysis________________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    51.1    mi/h
Percent time-spent-following, PTSFd (from above)             51.8
Level of service, LOSd (from above)                       B

______________________Average Travel Speed  with Passing Lane______________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

___________________Percent Time-Spent-Following with Passing Lane__________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde   -      mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld   -      mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                 -
Percent time-spent-following
   including passing lane, PTSFpl                      -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -      veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          317.4
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                 3.40
Bicycle LOS                                      C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
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Phone:                     Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2020
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0    ft    % Trucks and buses       6       %
Lane width          12.0    ft    % Trucks crawling        0.0     %
Segment length       0.0    mi    Truck crawl speed        0.0     mi/hr
Terrain type        Level         % Recreational vehicles  4       %
Grade:  Length       -      mi    % No-passing zones       20      %
     Up/down      -     %     Access point density     8       /mi

Analysis direction volume, Vd  512     veh/h
Opposing direction volume, Vo  264     veh/h

___________________________Average Travel Speed______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1               1.4
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994             0.977
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi         560     pc/h        294     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -     mi/h
Observed total demand,(note-3) V               -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                   58.0    mi/h

Adjustment for no-passing zones, fnp          1.6     mi/h
Average travel speed, ATSd                  49.8    mi/h
Percent Free Flow Speed, PFFS                85.9    %




___________________________Percent Time-Spent-Following___________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.0                1.1
PCE for RVs, ER                          1.0                1.0
Heavy-vehicle adjustment factor, fHV       1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         557     pc/h         289     pc/h
Base percent time-spent-following,(note-4) BPTSFd  52.1   %
Adjustment for no-passing zones, fnp              24.8
Percent time-spent-following, PTSFd               68.4   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                       B
Volume to capacity ratio, v/c                 0.33
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1661    veh/h
Capacity from PTSF, CdPTSF                        1690    veh/h
Directional Capacity                         1661    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    49.8    mi/h
Percent time-spent-following, PTSFd (from above)            68.4
Level of service, LOSd (from above)                         B

____________________Average Travel Speed  with Passing Lane_____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane________________
```

```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -      mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -      mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                -
Percent time-spent-following
   including passing lane, PTSFpl                     -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -      veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking      0
Pavement rating, P                               3
Flow rate in outside lane, vOL                       556.5
Effective width of outside lane, We                   24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              3.69
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
```

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Phone:                         Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                 Bush Street
From/To                 Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2020
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses      6      %
Lane width         12.0    ft    % Trucks crawling       0.0    %
Segment length      0.0    mi    Truck crawl speed       0.0    mi/hr
Terrain type        Level        % Recreational vehicles  4      %
Grade:  Length      -      mi    % No-passing zones      20     %
     Up/down      -      %     Access point density     8      /mi

Analysis direction volume, Vd  222     veh/h
Opposing direction volume, Vo  264     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.5              1.4
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.971            0.977
Grade adj. factor,(note-1) fg          1.00             1.00
Directional flow rate,(note-2) vi        249     pc/h      294     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -     mi/h
Observed total demand,(note-3) V              -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.6     mi/h
Average travel speed, ATSd                  52.2    mi/h
Percent Free Flow Speed, PFFS                 90.0    %




__________________________Percent Time-Spent-Following__________________________

Direction                    Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1                1.1
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         243    pc/h        289     pc/h
Base percent time-spent-following,(note-4) BPTSFd  28.4   %
Adjustment for no-passing zones, fnp              38.1
Percent time-spent-following, PTSFd               45.8   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                       B
Volume to capacity ratio, v/c                  0.15
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1661    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                        1661    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    52.2    mi/h
Percent time-spent-following, PTSFd (from above)            45.8
Level of service, LOSd (from above)                         B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                   -
Percent time-spent-following
   including passing lane, PTSFpl                        -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                        241.3
Effective width of outside lane, We                     24.00
Effective speed factor, St                         4.79
Bicycle LOS Score, BLOS                               3.27
Bicycle LOS                                     C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                Shalisha Hodson
Agency/Co.               R&S Civil
Date Performed           12/14/2020
Analysis Time Period    PM
Highway                  Bush Street
From/To                  Belle Haven Dr/SR 41
Jurisdiction             Kings County
Analysis Year            2020+Project
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width      6.0    ft     % Trucks and buses       6       %
Lane width         12.0    ft     % Trucks crawling        0.0     %
Segment length      0.0    mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level         % Recreational vehicles  4       %
Grade:  Length      -      mi     % No-passing zones       20      %
        Up/down     -      %      Access point density     8       /mi

Analysis direction volume, Vd  378     veh/h
Opposing direction volume, Vo  335     veh/h

____________________________Average Travel Speed______________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.3               1.3
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982              0.982
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi        418     pc/h      371     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -     mi/h
Observed total demand,(note-3) V               -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                   58.0    mi/h

Adjustment for no-passing zones, fnp          1.4     mi/h
Average travel speed, ATSd                  50.5    mi/h
Percent Free Flow Speed, PFFS                 87.0    %




__________________________Percent Time-Spent-Following__________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.0                1.1
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         411    pc/h         366     pc/h
Base percent time-spent-following,(note-4) BPTSFd  43.4   %
Adjustment for no-passing zones, fnp              32.8
Percent time-spent-following, PTSFd               60.7   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                       B
Volume to capacity ratio, v/c                   0.25
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1669    veh/h
Capacity from PTSF, CdPTSF                      1690    veh/h
Directional Capacity                       1669    veh/h

_____________________________Passing Lane Analysis_____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    50.5    mi/h
Percent time-spent-following, PTSFd (from above)             60.7
Level of service, LOSd (from above)                          B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                               -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                       -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                          55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                             3
Flow rate in outside lane, vOL                      410.9
Effective width of outside lane, We                   24.00
Effective speed factor, St                      4.79
Bicycle LOS Score, BLOS                          3.54
Bicycle LOS                                  D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2020+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 1            Peak hour factor, PHF    0.92
Shoulder width      6.0    ft     % Trucks and buses       6       %
Lane width         12.0    ft     % Trucks crawling        0.0     %
Segment length      0.0    mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level         % Recreational vehicles  4       %
Grade:  Length       -      mi    % No-passing zones       20      %
      Up/down        -      %     Access point density     8       /mi

Analysis direction volume, Vd  302     veh/h
Opposing direction volume, Vo  560     veh/h

____________________________Average Travel Speed______________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.4                1.1
PCE for RVs, ER                      1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.994
Grade adj. factor,(note-1) fg         1.00               1.00
Directional flow rate,(note-2) vi      336     pc/h       612     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0    mi/h
Adj. for access point density,(note-3) fA      2.0    mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.0     mi/h
Average travel speed, ATSd                 49.7    mi/h
Percent Free Flow Speed, PFFS               85.6    %




_________________________Percent Time-Spent-Following_________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1                1.0
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         330    pc/h         609     pc/h
Base percent time-spent-following,(note-4) BPTSFd  40.7   %
Adjustment for no-passing zones, fnp              23.8
Percent time-spent-following, PTSFd               49.1   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                        C
Volume to capacity ratio, v/c                  0.20
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                         1690    veh/h

____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    49.7    mi/h
Percent time-spent-following, PTSFd (from above)             49.1
Level of service, LOSd (from above)                         C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15              -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                          55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                             3
Flow rate in outside lane, vOL                       328.3
Effective width of outside lane, We                    24.00
Effective speed factor, St                       4.79
Bicycle LOS Score, BLOS                              3.42
Bicycle LOS                                    C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

________________Directional Two-Lane Highway Segment Analysis_______________

Analyst              Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway                 Bush Street
From/To                 Semas Dr/Belle Haven Dr
Jurisdiction            Kings County
Analysis Year           2020+Project
Description  Community College Expansion

________________________________Input Data________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
     Up/down       -       %      Access point density     8       /mi

Analysis direction volume, Vd  302     veh/h
Opposing direction volume, Vo  270     veh/h

__________________________Average Travel Speed____________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.4                1.4
PCE for RVs, ER                         1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.977
Grade adj. factor,(note-1) fg           1.00               1.00
Directional flow rate,(note-2) vi         336     pc/h       300     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.5     mi/h
Average travel speed, ATSd                  51.5    mi/h
Percent Free Flow Speed, PFFS                88.8    %




_________________________Percent Time-Spent-Following_________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.1                1.1
PCE for RVs, ER                         1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         330    pc/h         295     pc/h
Base percent time-spent-following,(note-4) BPTSFd  35.7   %
Adjustment for no-passing zones, fnp              37.1
Percent time-spent-following, PTSFd               55.3   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.20
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15             0.0     veh-h
Capacity from ATS, CdATS                       1661    veh/h
Capacity from PTSF, CdPTSF                      1690    veh/h
Directional Capacity                         1661    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                     0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                   51.5    mi/h
Percent time-spent-following, PTSFd (from above)            55.3
Level of service, LOSd (from above)                        B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                               -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
```

```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                       328.3
Effective width of outside lane, We                    24.00
Effective speed factor, St                         4.79
Bicycle LOS Score, BLOS                              3.42
Bicycle LOS                                     C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                          Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: PM
Highway:        Bush Street
From/To:        SR 41 NB/N 19 1/2 Ave
Jurisdiction:   Kings County
Analysis Year:  2020+Project
Project ID:     Community College Expansion

_______________________________FREE-FLOW SPEED__________________________________

          Direction         1              2
Lane width                  12.0     ft    12.0     ft
Lateral clearance:
   Right edge               6.0      ft    6.0      ft
   Left edge                6.0      ft    6.0      ft
   Total lateral clearance  12.0     ft    12.0     ft
Access points per mile      0              0
Median type
Free-flow speed:            Measured       Measured
   FFS or BFFS              55.0     mph   55.0     mph
Lane width adjustment, FLW  0.0      mph   0.0      mph
Lateral clearance adjustment, FLC  0.0      mph   0.0      mph
Median type adjustment, FM  0.0      mph   0.0      mph
Access points adjustment, FA  0.0      mph   0.0      mph
Free-flow speed             55.0     mph   55.0     mph

____________________________________VOLUME______________________________________

          Direction         1              2
Volume, V                   560      vph   370      vph
Peak-hour factor, PHF       0.92           0.92
Peak 15-minute volume, v15  152            101
Trucks and buses            5        %     5        %
Recreational vehicles       0        %     0        %
Terrain type                Level          Level
   Grade                    0.00     %     0.00     %
   Segment length           0.00     mi    0.00     mi
```

```
Number of lanes                    2              2
Driver population adjustment, fP    1.00           1.00
Trucks and buses PCE, ET           1.5            1.5
Recreational vehicles PCE, ER      1.2            1.2
Heavy vehicle adjustment, fHV      0.976          0.976
Flow rate, vp                    311      pcphpl  206      pcphpl

_________________________________RESULTS_________________________________

               Direction         1              2
Flow rate, vp                    311      pcphpl  206      pcphpl
Free-flow speed, FFS              55.0     mph     55.0     mph
Avg. passenger-car travel speed, S 55.0     mph     55.0     mph
Level of service, LOS              A              A
Density, D                       5.7      pc/mi/ln 3.7      pc/mi/ln

_____________________ Bicycle Level of Service _____________________

Posted speed limit, Sp             55             55
Percent of segment with occupied
on-highway parking                 0              0
Pavement rating, P                 3              3
Flow rate in outside lane, vOL     304.3          201.1
Effective width of outside lane, We 24.00          24.00
Effective speed factor, St         4.79           4.79
Bicycle LOS Score, BLOS            3.07           2.86
Bicycle LOS                        C              C

 Overall results are not computed when free-flow speed is less than 45 mph.
```

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Phone:                       Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:       Shalisha Hodson
Agency/Co:       R&S Civil
Date:          12/18/2020
Analysis Period: PM
Highway:        Bush Street
From/To:        SR 41 SB/SR 41 NB
Jurisdiction:    Kings County
Analysis Year:   2020+Project
Project ID:      Community College Expansion

_______________________________FREE-FLOW SPEED_________________________________

              Direction         1              2
Lane width                      12.0     ft      12.0     ft
Lateral clearance:
   Right edge                   6.0      ft      6.0      ft
   Left edge                    6.0      ft      6.0      ft
   Total lateral clearance      12.0     ft      12.0     ft
Access points per mile          0                0
Median type
Free-flow speed:                Measured         Measured
   FFS or BFFS                  55.0     mph     55.0     mph
Lane width adjustment, FLW      0.0      mph     0.0      mph
Lateral clearance adjustment, FLC 0.0    mph     0.0      mph
Median type adjustment, FM      0.0      mph     0.0      mph
Access points adjustment, FA    0.0      mph     0.0      mph
Free-flow speed                 55.0     mph     55.0     mph

____________________________________VOLUME_____________________________________

              Direction         1              2
Volume, V                       372      vph     394      vph
Peak-hour factor, PHF           0.92             0.92
Peak 15-minute volume, v15      101              107
Trucks and buses                5        %       5        %
Recreational vehicles           0        %       0        %
Terrain type                    Level            Level
   Grade                        0.00     %       0.00     %
   Segment length               0.00     mi      0.00     mi
```

```
Number of lanes                    2              2
Driver population adjustment, fP     1.00           1.00
Trucks and buses PCE, ET            1.5            1.5
Recreational vehicles PCE, ER        1.2            1.2
Heavy vehicle adjustment, fHV        0.976          0.976
Flow rate, vp                     207      pcphpl   219      pcphpl

______________________________________RESULTS______________________________________

              Direction          1              2
Flow rate, vp                     207      pcphpl   219      pcphpl
Free-flow speed, FFS                55.0     mph      55.0     mph
Avg. passenger-car travel speed, S   55.0     mph      55.0     mph
Level of service, LOS               A              A
Density, D                        3.8      pc/mi/ln 4.0      pc/mi/ln

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp              55             55
Percent of segment with occupied
on-highway parking                  0              0
Pavement rating, P                  3              3
Flow rate in outside lane, vOL       202.2          214.1
Effective width of outside lane, We  24.00          24.00
Effective speed factor, St           4.79           4.79
Bicycle LOS Score, BLOS              2.86           2.89
Bicycle LOS                        C              C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                    Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year          2020+Project
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0    ft     % Trucks and buses       6       %
Lane width          12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0    mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level          % Recreational vehicles  4       %
Grade:  Length       -      mi     % No-passing zones       20      %
        Up/down      -      %      Access point density     8       /mi

Analysis direction volume, Vd  335     veh/h
Opposing direction volume, Vo  378     veh/h

____________________________Average Travel Speed_______________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.3                1.3
PCE for RVs, ER                      1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982              0.982
Grade adj. factor,(note-1) fg          1.00               1.00
Directional flow rate,(note-2) vi         371     pc/h       418     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS           60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.3     mi/h
Average travel speed, ATSd                 50.5    mi/h
Percent Free Flow Speed, PFFS               87.2    %




__________________________Percent Time-Spent-Following__________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.1                1.0
PCE for RVs, ER                         1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994               1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        366    pc/h         411     pc/h
Base percent time-spent-following,(note-4) BPTSFd  40.8   %
Adjustment for no-passing zones, fnp              32.8
Percent time-spent-following, PTSFd               56.3   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                           B
Volume to capacity ratio, v/c                     0.22
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1669    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                        1669    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                  50.5    mi/h
Percent time-spent-following, PTSFd (from above)            56.3
Level of service, LOSd (from above)                        B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                        -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                           364.1
Effective width of outside lane, We                        24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                 3.47
Bicycle LOS                                       C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                      Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2020+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 1           Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6      %
Lane width         12.0    ft    % Trucks crawling        0.0    %
Segment length      0.0    mi    Truck crawl speed        0.0    mi/hr
Terrain type       Level         % Recreational vehicles  4      %
Grade:  Length      -      mi    % No-passing zones       20     %
      Up/down      -      %      Access point density     8      /mi

Analysis direction volume, Vd  560     veh/h
Opposing direction volume, Vo  302     veh/h

____________________________Average Travel Speed______________________________

Direction                       Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.1              1.4
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994             0.977
Grade adj. factor,(note-1) fg             1.00              1.00
Directional flow rate,(note-2) vi         612     pc/h      336     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -     mi/h
Observed total demand,(note-3) V                -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                          58.0    mi/h

Adjustment for no-passing zones, fnp           1.5     mi/h
Average travel speed, ATSd                     49.2    mi/h
Percent Free Flow Speed, PFFS                  84.8    %



__________________________Percent Time-Spent-Following__________________________

Direction                          Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.0                1.1
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        609    pc/h        330     pc/h
Base percent time-spent-following,(note-4) BPTSFd  54.5   %
Adjustment for no-passing zones, fnp              23.8
Percent time-spent-following, PTSFd               69.9   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                          D
Volume to capacity ratio, v/c                    0.36
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1661    veh/h
Capacity from PTSF, CdPTSF                      1690    veh/h
Directional Capacity                            1661    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                     49.2    mi/h
Percent time-spent-following, PTSFd (from above)            69.9
Level of service, LOSd (from above)                         D

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl     0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                       608.7
Effective width of outside lane, We                    24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                              3.74
Bicycle LOS                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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                HCS 2010: Two-Lane Highways Release 6.65







Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2020+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6       %
Lane width         12.0    ft    % Trucks crawling        0.0     %
Segment length      0.0    mi    Truck crawl speed        0.0     mi/hr
Terrain type        Level        % Recreational vehicles  4       %
Grade:  Length      -      mi    % No-passing zones       20      %
      Up/down       -      %     Access point density     8       /mi

Analysis direction volume, Vd  270     veh/h
Opposing direction volume, Vo  302     veh/h

____________________________Average Travel Speed______________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.4                1.4
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.977
Grade adj. factor,(note-1) fg           1.00               1.00
Directional flow rate,(note-2) vi        300     pc/h       336     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM            -     mi/h
Observed total demand,(note-3) V              -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS           60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA     2.0     mi/h
```

```
Free-flow speed, FFSd                      58.0    mi/h

Adjustment for no-passing zones, fnp           1.5     mi/h
Average travel speed, ATSd                  51.6    mi/h
Percent Free Flow Speed, PFFS                88.9    %




_________________________Percent Time-Spent-Following_________________________

Direction                      Analysis(d)         Opposing (o)
PCE for trucks, ET                      1.1                  1.1
PCE for RVs, ER                         1.0                  1.0
Heavy-vehicle adjustment factor, fHV      0.994                0.994
Grade adjustment factor,(note-1) fg       1.00                 1.00
Directional flow rate,(note-2) vi         295    pc/h          330     pc/h
Base percent time-spent-following,(note-4) BPTSFd  32.9   %
Adjustment for no-passing zones, fnp               37.1
Percent time-spent-following, PTSFd                50.4   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.18
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1661    veh/h
Capacity from PTSF, CdPTSF                        1690    veh/h
Directional Capacity                         1661    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    51.6    mi/h
Percent time-spent-following, PTSFd (from above)             50.4
Level of service, LOSd (from above)                      B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -      veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                       293.5
Effective width of outside lane, We                    24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              3.36
Bicycle LOS                                   C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
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               HCS 2010: Two-Lane Highways Release 6.65




Phone:                        Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway               Bush Street
From/To               Belle Haven Dr/SR 41
Jurisdiction          Kings County
Analysis Year           2024
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level         % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
       Up/down      -       %      Access point density     8       /mi

Analysis direction volume, Vd  376     veh/h
Opposing direction volume, Vo  317     veh/h

_____________________________Average Travel Speed______________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.3               1.4
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982              0.977
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi         416     pc/h        353     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                        58.0    mi/h

Adjustment for no-passing zones, fnp           1.4     mi/h
Average travel speed, ATSd                   50.6    mi/h
Percent Free Flow Speed, PFFS                  87.2    %




_________________________Percent Time-Spent-Following_________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.0                1.1
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         409    pc/h         347     pc/h
Base percent time-spent-following,(note-4) BPTSFd  42.7   %
Adjustment for no-passing zones, fnp              32.8
Percent time-spent-following, PTSFd               60.4   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          B
Volume to capacity ratio, v/c                    0.24
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1661    veh/h
Capacity from PTSF, CdPTSF                        1690    veh/h
Directional Capacity                          1661    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      50.6    mi/h
Percent time-spent-following, PTSFd (from above)             60.4
Level of service, LOSd (from above)                          B

___________________Average Travel Speed  with Passing Lane___________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                       408.7
Effective width of outside lane, We                    24.00
Effective speed factor, St                         4.79
Bicycle LOS Score, BLOS                              3.53
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway               Bush Street
From/To               College Ave/Semas Dr
Jurisdiction          Kings County
Analysis Year          2024
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width      6.0     ft     % Trucks and buses       6        %
Lane width         12.0     ft     % Trucks crawling        0.0      %
Segment length      0.0     mi     Truck crawl speed        0.0      mi/hr
Terrain type        Level          % Recreational vehicles  4        %
Grade:  Length      -       mi     % No-passing zones       20       %
        Up/down     -       %      Access point density     8        /mi

Analysis direction volume, Vd  304     veh/h
Opposing direction volume, Vo  538     veh/h

____________________________Average Travel Speed_______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.4               1.1
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.994
Grade adj. factor,(note-1) fg          1.00               1.00
Directional flow rate,(note-2) vi        338     pc/h        588     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0      mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.0     mi/h
Average travel speed, ATSd                 49.8    mi/h
Percent Free Flow Speed, PFFS                85.8    %




__________________________Percent Time-Spent-Following__________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1                1.0
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         332    pc/h         585     pc/h
Base percent time-spent-following,(note-4) BPTSFd  40.0   %
Adjustment for no-passing zones, fnp              24.6
Percent time-spent-following, PTSFd               48.9   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.20
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                        1690    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    49.8    mi/h
Percent time-spent-following, PTSFd (from above)             48.9
Level of service, LOSd (from above)                         B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                       -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -      veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          330.4
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                 3.42
Bicycle LOS                                      C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                         Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2024
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
        Up/down      -       %      Access point density     8       /mi

Analysis direction volume, Vd  279     veh/h
Opposing direction volume, Vo  245     veh/h

____________________________Average Travel Speed_______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.4                1.4
PCE for RVs, ER                         1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.977
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi         310     pc/h        273     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0      mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                       58.0    mi/h

Adjustment for no-passing zones, fnp          1.6     mi/h
Average travel speed, ATSd                  51.9    mi/h
Percent Free Flow Speed, PFFS                 89.4    %




__________________________Percent Time-Spent-Following__________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1                1.1
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        305    pc/h         268     pc/h
Base percent time-spent-following,(note-4) BPTSFd  33.2   %
Adjustment for no-passing zones, fnp              38.0
Percent time-spent-following, PTSFd               53.4   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.18
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1661    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                         1661    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    51.9    mi/h
Percent time-spent-following, PTSFd (from above)             53.4
Level of service, LOSd (from above)                          B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                             -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                 -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                           55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                       303.3
Effective width of outside lane, We                    24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                             3.38
Bicycle LOS                                   C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
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Phone:                          Fax:
E-mail:

____________________________OPERATIONAL ANALYSIS_________________________________

Analyst:         Shalisha Hodson
Agency/Co:       R&S Civil
Date:            12/18/2020
Analysis Period: PM
Highway:         Bush Street
From/To:         SR 41 NB/N 19 1/2 Ave
Jurisdiction:    Kings County
Analysis Year:   2024
Project ID:      Community College Expansion

________________________________FREE-FLOW SPEED__________________________________

            Direction           1               2
Lane width                      12.0     ft     12.0     ft
Lateral clearance:
   Right edge                   6.0      ft     6.0      ft
   Left edge                    6.0      ft     6.0      ft
   Total lateral clearance      12.0     ft     12.0     ft
Access points per mile          0               0
Median type
Free-flow speed:                Measured        Measured
   FFS or BFFS                  55.0     mph    55.0     mph
Lane width adjustment, FLW      0.0      mph    0.0      mph
Lateral clearance adjustment, FLC 0.0    mph    0.0      mph
Median type adjustment, FM      0.0      mph    0.0      mph
Access points adjustment, FA    0.0      mph    0.0      mph
Free-flow speed                 55.0     mph    55.0     mph

______________________________________VOLUME______________________________________

            Direction           1               2
Volume, V                       580      vph    375      vph
Peak-hour factor, PHF           0.92            0.92
Peak 15-minute volume, v15      158             102
Trucks and buses                5        %      5        %
Recreational vehicles           0        %      0        %
Terrain type                    Level           Level
  Grade                         0.00     %      0.00     %
  Segment length                0.00     mi     0.00     mi
```

```
Number of lanes                    2              2
Driver population adjustment, fP    1.00           1.00
Trucks and buses PCE, ET            1.5            1.5
Recreational vehicles PCE, ER       1.2            1.2
Heavy vehicle adjustment, fHV       0.976          0.976
Flow rate, vp                      323    pcphpl  208    pcphpl

_______________________________RESULTS______________________________

            Direction        1              2
Flow rate, vp                      323    pcphpl  208    pcphpl
Free-flow speed, FFS               55.0   mph     55.0   mph
Avg. passenger-car travel speed, S 55.0   mph     55.0   mph
Level of service, LOS              A              A
Density, D                         5.9    pc/mi/ln 3.8   pc/mi/ln

______________________ Bicycle Level of Service ______________________

Posted speed limit, Sp             55             55
Percent of segment with occupied
on-highway parking                 0              0
Pavement rating, P                 3              3
Flow rate in outside lane, vOL     315.2          203.8
Effective width of outside lane, We 24.00         24.00
Effective speed factor, St         4.79           4.79
Bicycle LOS Score, BLOS            3.09           2.87
Bicycle LOS                        C              C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                        Fax:
E-mail:

______________________________OPERATIONAL ANALYSIS____________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: PM
Highway:        Bush Street
From/To:        SR 41 SB/SR 41 NB
Jurisdiction:   Kings County
Analysis Year:  2024
Project ID:     Community College Expansion

_________________________________FREE-FLOW SPEED_______________________________

             Direction         1              2
Lane width                    12.0     ft     12.0     ft
Lateral clearance:
   Right edge                 6.0      ft     6.0      ft
   Left edge                  6.0      ft     6.0      ft
   Total lateral clearance    12.0     ft     12.0     ft
Access points per mile        0               0
Median type
Free-flow speed:              Measured        Measured
   FFS or BFFS                55.0     mph    55.0     mph
Lane width adjustment, FLW         0.0      mph    0.0      mph
Lateral clearance adjustment, FLC  0.0      mph    0.0      mph
Median type adjustment, FM         0.0      mph    0.0      mph
Access points adjustment, FA       0.0      mph    0.0      mph
Free-flow speed               55.0     mph    55.0     mph

_____________________________________VOLUME____________________________________

             Direction         1              2
Volume, V                     372      vph    387      vph
Peak-hour factor, PHF         0.92            0.92
Peak 15-minute volume, v15    101             105
Trucks and buses              5        %      5        %
Recreational vehicles         0        %      0        %
Terrain type                  Level           Level
   Grade                      0.00     %      0.00     %
   Segment length             0.00     mi     0.00     mi
```

```
Number of lanes                  2            2
Driver population adjustment, fP     1.00          1.00
Trucks and buses PCE, ET           1.5           1.5
Recreational vehicles PCE, ER       1.2           1.2
Heavy vehicle adjustment, fHV       0.976          0.976
Flow rate, vp                  207      pcphpl   215      pcphpl

_____________________________RESULTS_____________________________

            Direction           1              2
Flow rate, vp                  207      pcphpl   215      pcphpl
Free-flow speed, FFS               55.0     mph      55.0     mph
Avg. passenger-car travel speed, S   55.0     mph      55.0     mph
Level of service, LOS              A              A
Density, D                     3.8      pc/mi/ln 3.9      pc/mi/ln

____________________ Bicycle Level of Service ____________________

Posted speed limit, Sp             55             55
Percent of segment with occupied
on-highway parking                 0              0
Pavement rating, P                 3              3
Flow rate in outside lane, vOL      202.2          210.3
Effective width of outside lane, We  24.00          24.00
Effective speed factor, St          4.79           4.79
Bicycle LOS Score, BLOS             2.86           2.88
Bicycle LOS                     C              C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                    Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.           R&S Civil
Date Performed       12/14/2020
Analysis Time Period PM
Highway              Bush Street
From/To              Belle Haven Dr/SR 41
Jurisdiction         Kings County
Analysis Year        2024
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6      %
Lane width          12.0   ft    % Trucks crawling        0.0    %
Segment length      0.0    mi    Truck crawl speed        0.0    mi/hr
Terrain type        Level        % Recreational vehicles  4      %
Grade:  Length      -      mi    % No-passing zones       20     %
     Up/down        -      %     Access point density     8      /mi

Analysis direction volume, Vd  317     veh/h
Opposing direction volume, Vo  376     veh/h

____________________________Average Travel Speed______________________________

Direction                       Analysis(d)       Opposing (o)
PCE for trucks, ET                   1.4               1.3
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV   0.977            0.982
Grade adj. factor,(note-1) fg          1.00              1.00
Directional flow rate,(note-2) vi      353    pc/h       416    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM            -     mi/h
Observed total demand,(note-3) V              -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS           60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0    mi/h
Adj. for access point density,(note-3) fA     2.0    mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.3     mi/h
Average travel speed, ATSd                    50.7    mi/h
Percent Free Flow Speed, PFFS                 87.4    %




__________________________Percent Time-Spent-Following__________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.1               1.0
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         347    pc/h        409     pc/h
Base percent time-spent-following,(note-4) BPTSFd  38.2   %
Adjustment for no-passing zones, fnp              32.8
Percent time-spent-following, PTSFd               53.3   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.21
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                         1669    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                         1669    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                     50.7    mi/h
Percent time-spent-following, PTSFd (from above)            53.3
Level of service, LOSd (from above)                          B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                         -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                -
Percent time-spent-following
   including passing lane, PTSFpl                     -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          344.6
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.45
Bicycle LOS                                       C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                        Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2024
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
     Up/down         -       %      Access point density     8       /mi

Analysis direction volume, Vd  538     veh/h
Opposing direction volume, Vo  304     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.1               1.4
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.977
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi         588     pc/h        338     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM               -      mi/h
Observed total demand,(note-3) V                 -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0      mi/h
Adj. for access point density,(note-3) fA      2.0      mi/h
```

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Free-flow speed, FFSd                          58.0    mi/h

Adjustment for no-passing zones, fnp            1.5     mi/h
Average travel speed, ATSd                     49.3    mi/h
Percent Free Flow Speed, PFFS                  85.1    %




_________________________Percent Time-Spent-Following_________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.0                1.1
PCE for RVs, ER                          1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        585    pc/h        332     pc/h
Base percent time-spent-following,(note-4) BPTSFd  53.2   %
Adjustment for no-passing zones, fnp              24.6
Percent time-spent-following, PTSFd               68.9   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                       B
Volume to capacity ratio, v/c                 0.35
Peak 15-min vehicle-miles of travel, VMT15        0       veh-mi
Peak-hour vehicle-miles of travel, VMT60          0       veh-mi
Peak 15-min total travel time, TT15             0.0     veh-h
Capacity from ATS, CdATS                        1661    veh/h
Capacity from PTSF, CdPTSF                      1690    veh/h
Directional Capacity                        1661    veh/h

____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                    0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl               -       mi
Average travel speed, ATSd (from above)                   49.3    mi/h
Percent time-spent-following, PTSFd (from above)            68.9
Level of service, LOSd (from above)                      B

___________________Average Travel Speed  with Passing Lane___________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl      0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                         584.8
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.72
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst             Shalisha Hodson
Agency/Co.           R&S Civil
Date Performed        12/14/2020
Analysis Time Period    PM
Highway              Bush Street
From/To              Semas Dr/Belle Haven Dr
Jurisdiction          Kings County
Analysis Year         2024
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3         Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6      %
Lane width         12.0    ft    % Trucks crawling        0.0    %
Segment length      0.0    mi    Truck crawl speed        0.0    mi/hr
Terrain type        Level        % Recreational vehicles  4      %
Grade:  Length       -     mi    % No-passing zones       20     %
      Up/down       -     %     Access point density     8      /mi

Analysis direction volume, Vd  245     veh/h
Opposing direction volume, Vo  279     veh/h

____________________________Average Travel Speed______________________________

Direction                       Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.4              1.4
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977             0.977
Grade adj. factor,(note-1) fg          1.00             1.00
Directional flow rate,(note-2) vi        273    pc/h       310    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -     mi/h
Observed total demand,(note-3) V              -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS           60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA     2.0     mi/h
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```
Free-flow speed, FFSd                   58.0    mi/h

Adjustment for no-passing zones, fnp         1.5     mi/h
Average travel speed, ATSd                   51.9    mi/h
Percent Free Flow Speed, PFFS                89.6    %




_________________________Percent Time-Spent-Following_________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.1               1.1
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adjustment factor, fHV      0.994             0.994
Grade adjustment factor,(note-1) fg       1.00              1.00
Directional flow rate,(note-2) vi         268    pc/h       305     pc/h
Base percent time-spent-following,(note-4) BPTSFd  30.1   %
Adjustment for no-passing zones, fnp             38.0
Percent time-spent-following, PTSFd              47.9   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         B
Volume to capacity ratio, v/c                 0.16
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                         1661    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                          1661    veh/h

______________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    51.9    mi/h
Percent time-spent-following, PTSFd (from above)           47.9
Level of service, LOSd (from above)                        B

___________________Average Travel Speed  with Passing Lane___________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                         -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl      0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                               55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                  3
Flow rate in outside lane, vOL                          266.3
Effective width of outside lane, We                       24.00
Effective speed factor, St                            4.79
Bicycle LOS Score, BLOS                                 3.32
Bicycle LOS                                        C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.           R&S Civil
Date Performed       12/14/2020
Analysis Time Period    PM
Highway              Bush Street
From/To              Belle Haven Dr/SR 41
Jurisdiction         Kings County
Analysis Year        2024+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6       %
Lane width         12.0    ft    % Trucks crawling        0.0     %
Segment length      0.0    mi    Truck crawl speed        0.0     mi/hr
Terrain type        Level        % Recreational vehicles  4       %
Grade:  Length      -      mi    % No-passing zones       20      %
      Up/down       -      %     Access point density     8       /mi

Analysis direction volume, Vd  410     veh/h
Opposing direction volume, Vo  360     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)       Opposing (o)
PCE for trucks, ET                    1.3               1.3
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982             0.982
Grade adj. factor,(note-1) fg             1.00              1.00
Directional flow rate,(note-2) vi         454     pc/h      398     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.4     mi/h
Average travel speed, ATSd                 50.0    mi/h
Percent Free Flow Speed, PFFS                86.2    %




_________________________Percent Time-Spent-Following_________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.0               1.1
PCE for RVs, ER                          1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         446    pc/h         394     pc/h
Base percent time-spent-following,(note-4) BPTSFd  46.1   %
Adjustment for no-passing zones, fnp              31.2
Percent time-spent-following, PTSFd               62.7   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          B
Volume to capacity ratio, v/c                    0.27
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1669    veh/h
Capacity from PTSF, CdPTSF                        1690    veh/h
Directional Capacity                          1669    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    50.0    mi/h
Percent time-spent-following, PTSFd (from above)             62.7
Level of service, LOSd (from above)                        B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                           -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                   -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                          445.7
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.58
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year           2024+Project
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level         % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
        Up/down      -       %      Access point density     8       /mi

Analysis direction volume, Vd  342     veh/h
Opposing direction volume, Vo  586     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.3               1.1
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982              0.994
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi        379     pc/h        641     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM            -      mi/h
Observed total demand,(note-3) V             -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS           60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0      mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                       58.0    mi/h

Adjustment for no-passing zones, fnp          0.9     mi/h
Average travel speed, ATSd                  49.2    mi/h
Percent Free Flow Speed, PFFS                 84.8    %




_________________________Percent Time-Spent-Following_________________________

Direction                     Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.1               1.0
PCE for RVs, ER                         1.0               1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         374    pc/h         637     pc/h
Base percent time-spent-following,(note-4) BPTSFd  44.1   %
Adjustment for no-passing zones, fnp              23.5
Percent time-spent-following, PTSFd               52.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.22
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                         1690    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                    49.2    mi/h
Percent time-spent-following, PTSFd (from above)            52.8
Level of service, LOSd (from above)                        B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                           -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                   -
Percent time-spent-following
   including passing lane, PTSFpl                         -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          371.7
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                 3.49
Bicycle LOS                                       C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                    Fax:
E-Mail:

_______________Directional Two-Lane Highway Segment Analysis______________

Analyst            Shalisha Hodson
Agency/Co.           R&S Civil
Date Performed       12/14/2020
Analysis Time Period   PM
Highway              Bush Street
From/To              Semas Dr/Belle Haven Dr
Jurisdiction         Kings County
Analysis Year         2024+Project
Description  Community College Expansion

______________________________Input Data______________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6      %
Lane width        12.0    ft    % Trucks crawling        0.0     %
Segment length      0.0    mi    Truck crawl speed        0.0    mi/hr
Terrain type       Level        % Recreational vehicles  4      %
Grade:  Length      -      mi    % No-passing zones       20     %
     Up/down      -      %     Access point density     8      /mi

Analysis direction volume, Vd  317     veh/h
Opposing direction volume, Vo  293     veh/h

_________________________Average Travel Speed__________________________

Direction                    Analysis(d)       Opposing (o)
PCE for trucks, ET                  1.4              1.4
PCE for RVs, ER                     1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977            0.977
Grade adj. factor,(note-1) fg          1.00             1.00
Directional flow rate,(note-2) vi       353    pc/h       326    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM            -     mi/h
Observed total demand,(note-3) V             -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS           60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.5     mi/h
Average travel speed, ATSd                  51.2    mi/h
Percent Free Flow Speed, PFFS                 88.3    %




__________________________Percent Time-Spent-Following__________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.1                1.1
PCE for RVs, ER                         1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         347    pc/h         320     pc/h
Base percent time-spent-following,(note-4) BPTSFd  37.6   %
Adjustment for no-passing zones, fnp              36.2
Percent time-spent-following, PTSFd               56.4   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                         B
Volume to capacity ratio, v/c                   0.21
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                          1661    veh/h
Capacity from PTSF, CdPTSF                         1690    veh/h
Directional Capacity                          1661    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                    0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                   51.2    mi/h
Percent time-spent-following, PTSFd (from above)             56.4
Level of service, LOSd (from above)                        B

____________________Average Travel Speed  with Passing Lane_____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                           -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane_________________
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```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                    -
Percent time-spent-following
   including passing lane, PTSFpl                         -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          344.6
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.45
Bicycle LOS                                      C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                         Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: PM
Highway:        Bush Street
From/To:        SR 41 NB/N 19 1/2 Ave
Jurisdiction:   Kings County
Analysis Year:  2024+Project
Project ID:     Community College Expansion

_______________________________FREE-FLOW SPEED_________________________________

          Direction          1              2
Lane width                   12.0    ft     12.0    ft
Lateral clearance:
  Right edge                 6.0     ft     6.0     ft
  Left edge                  6.0     ft     6.0     ft
  Total lateral clearance    12.0    ft     12.0    ft
Access points per mile       0              0
Median type
Free-flow speed:             Measured       Measured
  FFS or BFFS                55.0    mph    55.0    mph
Lane width adjustment, FLW           0.0    mph    0.0    mph
Lateral clearance adjustment, FLC    0.0    mph    0.0    mph
Median type adjustment, FM           0.0    mph    0.0    mph
Access points adjustment, FA         0.0    mph    0.0    mph
Free-flow speed              55.0    mph    55.0    mph

____________________________________VOLUME_____________________________________

          Direction          1              2
Volume, V                    606     vph    407     vph
Peak-hour factor, PHF        0.92           0.92
Peak 15-minute volume, v15   165            111
Trucks and buses             5       %      5       %
Recreational vehicles        0       %      0       %
Terrain type                 Level          Level
 Grade                       0.00    %      0.00    %
 Segment length              0.00    mi     0.00    mi
```

```
Number of lanes                 2               2
Driver population adjustment, fP     1.00             1.00
Trucks and buses PCE, ET           1.5              1.5
Recreational vehicles PCE, ER       1.2              1.2
Heavy vehicle adjustment, fHV       0.976            0.976
Flow rate, vp                    337      pcphpl   226      pcphpl

____________________________________RESULTS____________________________________

                Direction           1               2
Flow rate, vp                    337      pcphpl   226      pcphpl
Free-flow speed, FFS                55.0      mph      55.0      mph
Avg. passenger-car travel speed, S   55.0      mph      55.0      mph
Level of service, LOS               A                A
Density, D                       6.1       pc/mi/ln 4.1       pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp              55               55
Percent of segment with occupied
on-highway parking                  0                0
Pavement rating, P                  3                3
Flow rate in outside lane, vOL       329.3            221.2
Effective width of outside lane, We  24.00            24.00
Effective speed factor, St          4.79             4.79
Bicycle LOS Score, BLOS              3.11             2.91
Bicycle LOS                      C                C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                     Fax:
E-mail:

______________________OPERATIONAL ANALYSIS___________________________

Analyst:       Shalisha Hodson
Agency/Co:       R&S Civil
Date:          12/18/2020
Analysis Period: PM
Highway:        Bush Street
From/To:        SR 41 SB/SR 41 NB
Jurisdiction:    Kings County
Analysis Year:   2024+Project
Project ID:     Community College Expansion

_________________________FREE-FLOW SPEED____________________________

           Direction         1           2
Lane width                  12.0    ft     12.0    ft
Lateral clearance:
   Right edge               6.0     ft     6.0     ft
   Left edge               6.0     ft     6.0     ft
   Total lateral clearance     12.0    ft     12.0    ft
Access points per mile         0           0
Median type
Free-flow speed:              Measured       Measured
   FFS or BFFS               55.0    mph    55.0    mph
Lane width adjustment, FLW        0.0     mph    0.0     mph
Lateral clearance adjustment, FLC   0.0     mph    0.0     mph
Median type adjustment, FM        0.0     mph    0.0     mph
Access points adjustment, FA       0.0     mph    0.0     mph
Free-flow speed                55.0    mph    55.0    mph

______________________________VOLUME_______________________________

           Direction         1           2
Volume, V                    403     vph    426     vph
Peak-hour factor, PHF           0.92          0.92
Peak 15-minute volume, v15        110           116
Trucks and buses               5      %      5      %
Recreational vehicles            0      %      0      %
Terrain type                  Level         Level
   Grade                    0.00    %     0.00    %
   Segment length              0.00    mi    0.00    mi
```

```
Number of lanes                  2               2
Driver population adjustment, fP     1.00            1.00
Trucks and buses PCE, ET          1.5             1.5
Recreational vehicles PCE, ER       1.2             1.2
Heavy vehicle adjustment, fHV       0.976           0.976
Flow rate, vp                  224      pcphpl   237      pcphpl

___________________________________RESULTS___________________________________

               Direction         1               2
Flow rate, vp                  224      pcphpl   237      pcphpl
Free-flow speed, FFS              55.0      mph      55.0      mph
Avg. passenger-car travel speed, S   55.0      mph      55.0      mph
Level of service, LOS              A               A
Density, D                     4.1      pc/mi/ln 4.3      pc/mi/ln

_________________________ Bicycle Level of Service _________________________

Posted speed limit, Sp             55              55
Percent of segment with occupied
on-highway parking                0               0
Pavement rating, P                3               3
Flow rate in outside lane, vOL      219.0           231.5
Effective width of outside lane, We  24.00           24.00
Effective speed factor, St         4.79            4.79
Bicycle LOS Score, BLOS            2.90            2.93
Bicycle LOS                     C               C

 Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                           Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                Shalisha Hodson
Agency/Co.               R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway                  Bush Street
From/To                  Belle Haven Dr/SR 41
Jurisdiction            Kings County
Analysis Year           2024+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling       0.0      %
Segment length       0.0     mi     Truck crawl speed       0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
       Up/down       -       %      Access point density     8       /mi

Analysis direction volume, Vd  360     veh/h
Opposing direction volume, Vo  410     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.3               1.3
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982             0.982
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi         398     pc/h       454     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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```
Free-flow speed, FFSd                        58.0    mi/h

Adjustment for no-passing zones, fnp          1.3     mi/h
Average travel speed, ATSd                   50.1    mi/h
Percent Free Flow Speed, PFFS                 86.4    %




_________________________Percent Time-Spent-Following_________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.1               1.0
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        394    pc/h        446     pc/h
Base percent time-spent-following,(note-4) BPTSFd  43.9   %
Adjustment for no-passing zones, fnp              31.2
Percent time-spent-following, PTSFd               58.5   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          B
Volume to capacity ratio, v/c                   0.23
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1669    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                         1669    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                      50.1    mi/h
Percent time-spent-following, PTSFd (from above)             58.5
Level of service, LOSd (from above)                          B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                                -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                        -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl      E
Peak 15-min total travel time, TT15                 -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking        0
Pavement rating, P                                  3
Flow rate in outside lane, vOL                         391.3
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.51
Bicycle LOS                                         D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                        Fax:
E-Mail:

________________Directional Two-Lane Highway Segment Analysis_______________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year           2024+Project
Description  Community College Expansion

________________________________Input Data________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level         % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
      Up/down      -      %      Access point density     8       /mi

Analysis direction volume, Vd  586     veh/h
Opposing direction volume, Vo  342     veh/h

__________________________Average Travel Speed____________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1                1.3
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.982
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi         641     pc/h       379     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0      mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.4     mi/h
Average travel speed, ATSd                 48.7    mi/h
Percent Free Flow Speed, PFFS                83.9    %




_________________________Percent Time-Spent-Following_________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.0               1.1
PCE for RVs, ER                          1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         637    pc/h         374     pc/h
Base percent time-spent-following,(note-4) BPTSFd  57.1   %
Adjustment for no-passing zones, fnp              23.5
Percent time-spent-following, PTSFd               71.9   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                            B
Volume to capacity ratio, v/c                    0.38
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1669    veh/h
Capacity from PTSF, CdPTSF                        1690    veh/h
Directional Capacity                             1669    veh/h

____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl              -       mi
Average travel speed, ATSd (from above)                  48.7    mi/h
Percent time-spent-following, PTSFd (from above)           71.9
Level of service, LOSd (from above)                       B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                             -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
```

```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                          637.0
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                3.76
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                        Fax:
E-Mail:

_____________________Directional Two-Lane Highway Segment Analysis____________________

Analyst                  Shalisha Hodson
Agency/Co.               R&S Civil
Date Performed           12/14/2020
Analysis Time Period     PM
Highway                  Bush Street
From/To                  Semas Dr/Belle Haven Dr
Jurisdiction             Kings County
Analysis Year            2024+Project
Description  Community College Expansion

_____________________________________Input Data______________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width      6.0   ft     % Trucks and buses      6       %
Lane width         12.0   ft     % Trucks crawling       0.0     %
Segment length      0.0   mi     Truck crawl speed       0.0     mi/hr
Terrain type        Level        % Recreational vehicles 4       %
Grade:  Length      -     mi     % No-passing zones      20      %
      Up/down       -     %      Access point density    8       /mi

Analysis direction volume, Vd  293     veh/h
Opposing direction volume, Vo  317     veh/h

______________________________Average Travel Speed_________________________________

Direction                          Analysis(d)       Opposing (o)
PCE for trucks, ET                      1.4              1.4
PCE for RVs, ER                         1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV  0.977            0.977
Grade adj. factor,(note-1) fg           1.00             1.00
Directional flow rate,(note-2) vi       326    pc/h      353    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                 -      mi/h
Observed total demand,(note-3) V                   -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS                 60.0   mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0    mi/h
Adj. for access point density,(note-3) fA      2.0    mi/h
```

```
Free-flow speed, FFSd                   58.0    mi/h

Adjustment for no-passing zones, fnp          1.4     mi/h
Average travel speed, ATSd                51.3    mi/h
Percent Free Flow Speed, PFFS               88.4    %




_____________________________Percent Time-Spent-Following_____________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1                1.1
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        320    pc/h         347     pc/h
Base percent time-spent-following,(note-4) BPTSFd  35.8   %
Adjustment for no-passing zones, fnp              36.2
Percent time-spent-following, PTSFd               53.2   %

__________________Level of Service and Other Performance Measures_________________

Level of service, LOS                        B
Volume to capacity ratio, v/c                   0.19
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1661    veh/h
Capacity from PTSF, CdPTSF                       1690    veh/h
Directional Capacity                        1661    veh/h

_________________________________Passing Lane Analysis________________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                     51.3    mi/h
Percent time-spent-following, PTSFd (from above)            53.2
Level of service, LOSd (from above)                         B

_____________________Average Travel Speed  with Passing Lane______________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                           -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

__________________Percent Time-Spent-Following with Passing Lane_________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                        318.5
Effective width of outside lane, We                     24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                              3.41
Bicycle LOS                                   C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

________________Directional Two-Lane Highway Segment Analysis_______________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year           2040
Description  Community College Expansion

________________________________Input Data________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
     Up/down         -       %      Access point density     8       /mi

Analysis direction volume, Vd  538     veh/h
Opposing direction volume, Vo  443     veh/h

__________________________Average Travel Speed____________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1                1.2
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.988
Grade adj. factor,(note-1) fg           1.00               1.00
Directional flow rate,(note-2) vi         588     pc/h       487     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.2     mi/h
Average travel speed, ATSd                  48.4    mi/h
Percent Free Flow Speed, PFFS                83.5    %




_________________________Percent Time-Spent-Following_________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.0              1.0
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adjustment factor, fHV      1.000             1.000
Grade adjustment factor,(note-1) fg       1.00              1.00
Directional flow rate,(note-2) vi         585    pc/h         482     pc/h
Base percent time-spent-following,(note-4) BPTSFd  56.9   %
Adjustment for no-passing zones, fnp              25.9
Percent time-spent-following, PTSFd               71.1   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                      B
Volume to capacity ratio, v/c                  0.35
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1680    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                       1680    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    48.4    mi/h
Percent time-spent-following, PTSFd (from above)            71.1
Level of service, LOSd (from above)                         B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                 -
Percent time-spent-following
   including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          584.8
Effective width of outside lane, We                       24.00
Effective speed factor, St                         4.79
Bicycle LOS Score, BLOS                                 3.72
Bicycle LOS                                        D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                        Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                College Ave/Semas Dr
Jurisdiction           Kings County
Analysis Year          2040
Description  Community College Expansion

___________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0    ft     % Trucks and buses       6       %
Lane width          12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0    mi     Truck crawl speed        0.0     mi/hr
Terrain type        Level          % Recreational vehicles  4       %
Grade:  Length       -      mi     % No-passing zones       20      %
     Up/down         -      %      Access point density     8       /mi

Analysis direction volume, Vd  597     veh/h
Opposing direction volume, Vo  657     veh/h

____________________________Average Travel Speed_______________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.1                1.1
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.994
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi         653     pc/h       718     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                        58.0    mi/h

Adjustment for no-passing zones, fnp           0.7     mi/h
Average travel speed, ATSd                   46.6    mi/h
Percent Free Flow Speed, PFFS                 80.4    %




__________________________Percent Time-Spent-Following__________________________

Direction                        Analysis(d)         Opposing (o)
PCE for trucks, ET                      1.0                1.0
PCE for RVs, ER                         1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         649    pc/h         714     pc/h
Base percent time-spent-following,(note-4) BPTSFd  62.3   %
Adjustment for no-passing zones, fnp               20.5
Percent time-spent-following, PTSFd                72.1   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                        C
Volume to capacity ratio, v/c                   0.38
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                         1690    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                     0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                     46.6    mi/h
Percent time-spent-following, PTSFd (from above)            72.1
Level of service, LOSd (from above)                         C

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                           -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

_________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                   -
Percent time-spent-following
   including passing lane, PTSFpl                         -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          648.9
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                 3.77
Bicycle LOS                                      D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                        Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2040
Description  Community College Expansion

_________________________________Input Data_________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling       0.0     %
Segment length       0.0     mi     Truck crawl speed       0.0     mi/hr
Terrain type        Level           % Recreational vehicles  4       %
Grade:  Length        -       mi     % No-passing zones      20      %
        Up/down       -       %      Access point density     8      /mi

Analysis direction volume, Vd  353     veh/h
Opposing direction volume, Vo  369     veh/h

___________________________Average Travel Speed_____________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.3               1.3
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982              0.982
Grade adj. factor,(note-1) fg          1.00              1.00
Directional flow rate,(note-2) vi        391     pc/h       408     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -     mi/h
Observed total demand,(note-3) V               -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS           60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                        58.0    mi/h

Adjustment for no-passing zones, fnp           1.3     mi/h
Average travel speed, ATSd                   50.5    mi/h
Percent Free Flow Speed, PFFS                  87.0    %




__________________________Percent Time-Spent-Following__________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.1                1.0
PCE for RVs, ER                         1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        386    pc/h         401     pc/h
Base percent time-spent-following,(note-4) BPTSFd  41.5   %
Adjustment for no-passing zones, fnp              33.5
Percent time-spent-following, PTSFd               57.9   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.23
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1669    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                         1669    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    50.5    mi/h
Percent time-spent-following, PTSFd (from above)            57.9
Level of service, LOSd (from above)                        B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde      -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                -
Percent time-spent-following
    including passing lane, PTSFpl                     -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking        0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          383.7
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                 3.50
Bicycle LOS                                       D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                         Fax:
E-mail:

_____________________________OPERATIONAL ANALYSIS__________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: PM
Highway:        Bush Street
From/To:        SR 41 NB/N 19 1/2 Ave
Jurisdiction:   Kings County
Analysis Year:  2040
Project ID:     Community College Expansion

_________________________________FREE-FLOW SPEED___________________________________

            Direction           1             2
Lane width                      12.0   ft     12.0   ft
Lateral clearance:
   Right edge                   6.0    ft     6.0    ft
   Left edge                    6.0    ft     6.0    ft
   Total lateral clearance      12.0   ft     12.0   ft
Access points per mile          0             0
Median type
Free-flow speed:                Measured      Measured
   FFS or BFFS                  55.0   mph    55.0   mph
Lane width adjustment, FLW      0.0    mph    0.0    mph
Lateral clearance adjustment, FLC 0.0  mph    0.0    mph
Median type adjustment, FM      0.0    mph    0.0    mph
Access points adjustment, FA    0.0    mph    0.0    mph
Free-flow speed                 55.0   mph    55.0   mph

_______________________________________VOLUME______________________________________

            Direction           1             2
Volume, V                       803    vph    571    vph
Peak-hour factor, PHF           0.92          0.92
Peak 15-minute volume, v15      218           155
Trucks and buses                5      %      5      %
Recreational vehicles           0      %      0      %
Terrain type                    Level         Level
   Grade                        0.00   %      0.00   %
   Segment length               0.00   mi     0.00   mi
```

```
Number of lanes                    2              2
Driver population adjustment, fP     1.00           1.00
Trucks and buses PCE, ET           1.5            1.5
Recreational vehicles PCE, ER       1.2            1.2
Heavy vehicle adjustment, fHV       0.976          0.976
Flow rate, vp                   447      pcphpl   318      pcphpl

_________________________________RESULTS_________________________________

              Direction          1              2
Flow rate, vp                   447      pcphpl   318      pcphpl
Free-flow speed, FFS              55.0      mph      55.0      mph
Avg. passenger-car travel speed, S   55.0      mph      55.0      mph
Level of service, LOS              A              A
Density, D                      8.1      pc/mi/ln 5.8      pc/mi/ln

________________________ Bicycle Level of Service ________________________

Posted speed limit, Sp             55             55
Percent of segment with occupied
on-highway parking                 0              0
Pavement rating, P                 3              3
Flow rate in outside lane, vOL       436.4          310.3
Effective width of outside lane, We  24.00          24.00
Effective speed factor, St          4.79           4.79
Bicycle LOS Score, BLOS              3.25           3.08
Bicycle LOS                        C              C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-mail:

____________________________OPERATIONAL ANALYSIS________________________________

Analyst:        Shalisha Hodson
Agency/Co:      R&S Civil
Date:           12/18/2020
Analysis Period: PM
Highway:        Bush Street
From/To:        SR 41 SB/SR 41 NB
Jurisdiction:   Kings County
Analysis Year:  2040
Project ID:     Community College Expansion

________________________________FREE-FLOW SPEED__________________________________

            Direction         1              2
Lane width                   12.0     ft     12.0     ft
Lateral clearance:
   Right edge                6.0      ft     6.0      ft
   Left edge                 6.0      ft     6.0      ft
   Total lateral clearance   12.0     ft     12.0     ft
Access points per mile       0               0
Median type
Free-flow speed:             Measured        Measured
   FFS or BFFS               55.0     mph    55.0     mph
Lane width adjustment, FLW           0.0      mph    0.0      mph
Lateral clearance adjustment, FLC    0.0      mph    0.0      mph
Median type adjustment, FM           0.0      mph    0.0      mph
Access points adjustment, FA         0.0      mph    0.0      mph
Free-flow speed              55.0     mph    55.0     mph

_____________________________________VOLUME______________________________________

            Direction         1              2
Volume, V                    528      vph    552      vph
Peak-hour factor, PHF        0.92            0.92
Peak 15-minute volume, v15   143             150
Trucks and buses             5        %      5        %
Recreational vehicles        0        %      0        %
Terrain type                 Level           Level
  Grade                      0.00     %      0.00     %
  Segment length             0.00     mi     0.00     mi
```

```
Number of lanes                  2               2
Driver population adjustment, fP     1.00            1.00
Trucks and buses PCE, ET          1.5             1.5
Recreational vehicles PCE, ER       1.2             1.2
Heavy vehicle adjustment, fHV       0.976           0.976
Flow rate, vp                   294      pcphpl   307      pcphpl

_____________________________________RESULTS_____________________________________

                Direction        1               2
Flow rate, vp                   294      pcphpl   307      pcphpl
Free-flow speed, FFS              55.0      mph      55.0      mph
Avg. passenger-car travel speed, S   55.0      mph      55.0      mph
Level of service, LOS              A               A
Density, D                      5.3      pc/mi/ln 5.6      pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp             55              55
Percent of segment with occupied
on-highway parking                 0               0
Pavement rating, P                3               3
Flow rate in outside lane, vOL       287.0           300.0
Effective width of outside lane, We  24.00           24.00
Effective speed factor, St          4.79            4.79
Bicycle LOS Score, BLOS             3.04            3.06
Bicycle LOS                      C               C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-Mail:

________________Directional Two-Lane Highway Segment Analysis_______________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year          2040
Description  Community College Expansion

________________________________Input Data________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length        -      mi     % No-passing zones       20      %
     Up/down          -      %      Access point density     8       /mi

Analysis direction volume, Vd  443     veh/h
Opposing direction volume, Vo  538     veh/h

__________________________Average Travel Speed____________________________

Direction                         Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.2                1.1
PCE for RVs, ER                       1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.988              0.994
Grade adj. factor,(note-1) fg         1.00               1.00
Directional flow rate,(note-2) vi        487     pc/h       588     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                  58.0    mi/h

Adjustment for no-passing zones, fnp          1.0     mi/h
Average travel speed, ATSd                  48.6    mi/h
Percent Free Flow Speed, PFFS                83.8    %




__________________________Percent Time-Spent-Following__________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.0                1.0
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        482    pc/h         585     pc/h
Base percent time-spent-following,(note-4) BPTSFd  50.7   %
Adjustment for no-passing zones, fnp              25.9
Percent time-spent-following, PTSFd               62.4   %

_________________Level of Service and Other Performance Measures________________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.29
Peak 15-min vehicle-miles of travel, VMT15          0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1690    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                         1690    veh/h

______________________________Passing Lane Analysis_____________________________

Total length of analysis segment, Lt                       0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -        mi
Length of passing lane including tapers, Lpl               -       mi
Average travel speed, ATSd (from above)                 48.6    mi/h
Percent time-spent-following, PTSFd (from above)            62.4
Level of service, LOSd (from above)                      B

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde      -        mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -        mi
Adj. factor for the effect of passing lane
   on average speed, fpl                              -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0      %

_________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                          481.5
Effective width of outside lane, We                       24.00
Effective speed factor, St                         4.79
Bicycle LOS Score, BLOS                                3.62
Bicycle LOS                                      D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                         Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway                 Bush Street
From/To                 College Ave/Semas Dr
Jurisdiction            Kings County
Analysis Year           2040
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses      6      %
Lane width         12.0    ft    % Trucks crawling       0.0    %
Segment length      0.0    mi    Truck crawl speed       0.0    mi/hr
Terrain type        Level        % Recreational vehicles  4     %
Grade:  Length      -      mi    % No-passing zones      20     %
      Up/down       -      %     Access point density    8      /mi

Analysis direction volume, Vd  657     veh/h
Opposing direction volume, Vo  597     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)       Opposing (o)
PCE for trucks, ET                     1.1                1.1
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994             0.994
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi        718     pc/h       653     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.9     mi/h
Average travel speed, ATSd                 46.5    mi/h
Percent Free Flow Speed, PFFS               80.1    %




______________________Percent Time-Spent-Following______________________

Direction                    Analysis(d)        Opposing (o)
PCE for trucks, ET                  1.0               1.0
PCE for RVs, ER                     1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        714    pc/h         649     pc/h
Base percent time-spent-following,(note-4) BPTSFd  64.3   %
Adjustment for no-passing zones, fnp             20.5
Percent time-spent-following, PTSFd              75.0   %

______________Level of Service and Other Performance Measures______________

Level of service, LOS                       C
Volume to capacity ratio, v/c                   0.42
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                        1690    veh/h

__________________________Passing Lane Analysis__________________________

Total length of analysis segment, Lt                     0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                  46.5    mi/h
Percent time-spent-following, PTSFd (from above)            75.0
Level of service, LOSd (from above)                      C

_________________Average Travel Speed  with Passing Lane_________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                         -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

______________Percent Time-Spent-Following with Passing Lane______________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                          714.1
Effective width of outside lane, We                       24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                                 3.82
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year           2040
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling       0.0     %
Segment length       0.0     mi     Truck crawl speed       0.0     mi/hr
Terrain type          Level         % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
      Up/down      -       %      Access point density     8       /mi

Analysis direction volume, Vd  369     veh/h
Opposing direction volume, Vo  353     veh/h

____________________________Average Travel Speed______________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.3              1.3
PCE for RVs, ER                        1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982              0.982
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi        408     pc/h       391     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.4     mi/h
Average travel speed, ATSd                  50.4    mi/h
Percent Free Flow Speed, PFFS                86.9    %




_________________________Percent Time-Spent-Following_________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.0               1.1
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        401    pc/h        386     pc/h
Base percent time-spent-following,(note-4) BPTSFd  41.7   %
Adjustment for no-passing zones, fnp              33.5
Percent time-spent-following, PTSFd               58.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          B
Volume to capacity ratio, v/c                    0.24
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1669    veh/h
Capacity from PTSF, CdPTSF                        1690    veh/h
Directional Capacity                         1669    veh/h

____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                     50.4    mi/h
Percent time-spent-following, PTSFd (from above)            58.8
Level of service, LOSd (from above)                          B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl      0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                -
Percent time-spent-following
   including passing lane, PTSFpl                     -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                           55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                              3
Flow rate in outside lane, vOL                        401.1
Effective width of outside lane, We                     24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              3.52
Bicycle LOS                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway                 Bush Street
From/To                 Belle Haven Dr/SR 41
Jurisdiction            Kings County
Analysis Year           2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0    ft     % Trucks and buses       6       %
Lane width          12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0    mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level         % Recreational vehicles  4       %
Grade:  Length       -      mi     % No-passing zones       20      %
     Up/down         -      %      Access point density     8       /mi

Analysis direction volume, Vd  572     veh/h
Opposing direction volume, Vo  486     veh/h

____________________________Average Travel Speed______________________________

Direction                         Analysis(d)       Opposing (o)
PCE for trucks, ET                     1.1               1.2
PCE for RVs, ER                        1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994             0.988
Grade adj. factor,(note-1) fg          1.00              1.00
Directional flow rate,(note-2) vi       625     pc/h      535     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0      mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.1     mi/h
Average travel speed, ATSd                  47.9    mi/h
Percent Free Flow Speed, PFFS                 82.5    %




__________________________Percent Time-Spent-Following__________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                     1.0                1.0
PCE for RVs, ER                        1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         622    pc/h         528     pc/h
Base percent time-spent-following,(note-4) BPTSFd  58.7   %
Adjustment for no-passing zones, fnp              24.5
Percent time-spent-following, PTSFd               72.0   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         C
Volume to capacity ratio, v/c                   0.37
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1680    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                          1680    veh/h

______________________________Passing Lane Analysis_____________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                   47.9    mi/h
Percent time-spent-following, PTSFd (from above)             72.0
Level of service, LOSd (from above)                        C

____________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                         621.7
Effective width of outside lane, We                    24.00
Effective speed factor, St                         4.79
Bicycle LOS Score, BLOS                                3.75
Bicycle LOS                                        D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
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Phone:                        Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.            R&S Civil
Date Performed        12/14/2020
Analysis Time Period    PM
Highway               Bush Street
From/To               College Ave/Semas Dr
Jurisdiction          Kings County
Analysis Year         2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
       Up/down       -       %      Access point density     8       /mi

Analysis direction volume, Vd  635     veh/h
Opposing direction volume, Vo  705     veh/h

___________________________Average Travel Speed______________________________

Direction                       Analysis(d)        Opposing (o)
PCE for trucks, ET                  1.1               1.1
PCE for RVs, ER                     1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994          0.994
Grade adj. factor,(note-1) fg       1.00              1.00
Directional flow rate,(note-2) vi        694     pc/h        771     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
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Free-flow speed, FFSd                     58.0    mi/h

Adjustment for no-passing zones, fnp          0.6     mi/h
Average travel speed, ATSd                 46.0    mi/h
Percent Free Flow Speed, PFFS               79.3    %




__________________________Percent Time-Spent-Following__________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.0                1.0
PCE for RVs, ER                         1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         690    pc/h         766     pc/h
Base percent time-spent-following,(note-4) BPTSFd  64.5   %
Adjustment for no-passing zones, fnp               19.1
Percent time-spent-following, PTSFd                73.6   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                          C
Volume to capacity ratio, v/c                  0.41
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                      1700    veh/h
Directional Capacity                         1690    veh/h

______________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                    46.0    mi/h
Percent time-spent-following, PTSFd (from above)             73.6
Level of service, LOSd (from above)                          C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                                -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                  -
Percent time-spent-following
   including passing lane, PTSFpl                        -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                            55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                        690.2
Effective width of outside lane, We                     24.00
Effective speed factor, St                        4.79
Bicycle LOS Score, BLOS                              3.80
Bicycle LOS                                     D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
  is one of the base conditions. For the purpose of grade adjustment, specific
  dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
  specific downgrade.
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Phone:                    Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6       %
Lane width         12.0    ft    % Trucks crawling        0.0     %
Segment length      0.0    mi    Truck crawl speed        0.0     mi/hr
Terrain type        Level        % Recreational vehicles  4       %
Grade:  Length      -      mi    % No-passing zones       20      %
     Up/down        -      %     Access point density     8       /mi

Analysis direction volume, Vd  391     veh/h
Opposing direction volume, Vo  414     veh/h

____________________________Average Travel Speed______________________________

Direction                        Analysis(d)      Opposing (o)
PCE for trucks, ET                    1.3              1.3
PCE for RVs, ER                       1.0              1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982           0.982
Grade adj. factor,(note-1) fg           1.00             1.00
Directional flow rate,(note-2) vi       433     pc/h      458     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -     mi/h
Observed total demand,(note-3) V                -     veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

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Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          1.3     mi/h
Average travel speed, ATSd                  49.8    mi/h
Percent Free Flow Speed, PFFS                85.9    %




_________________________Percent Time-Spent-Following_________________________

Direction                     Analysis(d)        Opposing (o)
PCE for trucks, ET                   1.0               1.0
PCE for RVs, ER                      1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi        425    pc/h         450     pc/h
Base percent time-spent-following,(note-4) BPTSFd  46.0   %
Adjustment for no-passing zones, fnp              31.4
Percent time-spent-following, PTSFd               61.3   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         B
Volume to capacity ratio, v/c                   0.25
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                         1669    veh/h
Capacity from PTSF, CdPTSF                        1700    veh/h
Directional Capacity                          1669    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                     0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                   49.8    mi/h
Percent time-spent-following, PTSFd (from above)            61.3
Level of service, LOSd (from above)                        B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
```

```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                   -
Percent time-spent-following
    including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15              -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                         425.0
Effective width of outside lane, We                      24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                               3.55
Bicycle LOS                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                          Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:        Shalisha Hodson
Agency/Co:        R&S Civil
Date:          12/18/2020
Analysis Period: PM
Highway:        Bush Street
From/To:        SR 41 NB/N 19 1/2 Ave
Jurisdiction:    Kings County
Analysis Year:   2040+Project
Project ID:     Community College Expansion

_______________________________FREE-FLOW SPEED_________________________________

          Direction          1              2
Lane width                 12.0    ft     12.0    ft
Lateral clearance:
   Right edge              6.0     ft     6.0     ft
   Left edge               6.0     ft     6.0     ft
   Total lateral clearance    12.0    ft     12.0    ft
Access points per mile        0               0
Median type
Free-flow speed:           Measured        Measured
   FFS or BFFS             55.0    mph    55.0    mph
Lane width adjustment, FLW       0.0     mph    0.0     mph
Lateral clearance adjustment, FLC   0.0     mph    0.0     mph
Median type adjustment, FM       0.0     mph    0.0     mph
Access points adjustment, FA     0.0     mph    0.0     mph
Free-flow speed            55.0    mph    55.0    mph

____________________________________VOLUME_____________________________________

          Direction          1              2
Volume, V                  829     vph    603     vph
Peak-hour factor, PHF        0.92           0.92
Peak 15-minute volume, v15      225            164
Trucks and buses              5      %      5      %
Recreational vehicles         0      %      0      %
Terrain type               Level          Level
   Grade                 0.00     %     0.00     %
   Segment length           0.00    mi     0.00    mi
```

```
Number of lanes                   2                 2
Driver population adjustment, fP     1.00              1.00
Trucks and buses PCE, ET            1.5               1.5
Recreational vehicles PCE, ER       1.2               1.2
Heavy vehicle adjustment, fHV       0.976             0.976
Flow rate, vp                    461       pcphpl   335       pcphpl

_________________________________RESULTS_________________________________

                 Direction          1                 2
Flow rate, vp                    461       pcphpl   335       pcphpl
Free-flow speed, FFS                  55.0      mph       55.0      mph
Avg. passenger-car travel speed, S   55.0      mph       55.0      mph
Level of service, LOS                 A                 A
Density, D                        8.4      pc/mi/ln 6.1       pc/mi/ln

_______________________ Bicycle Level of Service _______________________

Posted speed limit, Sp               55                55
Percent of segment with occupied
on-highway parking                    0                 0
Pavement rating, P                   3                 3
Flow rate in outside lane, vOL       450.5             327.7
Effective width of outside lane, We  24.00             24.00
Effective speed factor, St           4.79              4.79
Bicycle LOS Score, BLOS              3.27              3.11
Bicycle LOS                       C                 C

  Overall results are not computed when free-flow speed is less than 45 mph.
```

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Phone:                        Fax:
E-mail:

_____________________________OPERATIONAL ANALYSIS_______________________________

Analyst:      Shalisha Hodson
Agency/Co:      R&S Civil
Date:         12/18/2020
Analysis Period: PM
Highway:       Bush Street
From/To:       SR 41 SB/SR 41 NB
Jurisdiction:   Kings County
Analysis Year:  2040+Project
Project ID:     Community College Expansion

__________________________________FREE-FLOW SPEED_________________________________

          Direction        1              2
Lane width                12.0    ft     12.0    ft
Lateral clearance:
   Right edge             6.0     ft     6.0     ft
   Left edge              6.0     ft     6.0     ft
   Total lateral clearance       12.0    ft     12.0    ft
Access points per mile         0              0
Median type
Free-flow speed:          Measured       Measured
   FFS or BFFS            55.0    mph    55.0    mph
Lane width adjustment, FLW        0.0     mph    0.0     mph
Lateral clearance adjustment, FLC  0.0     mph    0.0     mph
Median type adjustment, FM        0.0     mph    0.0     mph
Access points adjustment, FA      0.0     mph    0.0     mph
Free-flow speed           55.0    mph    55.0    mph

________________________________________VOLUME______________________________________

          Direction        1              2
Volume, V                 559     vph    591     vph
Peak-hour factor, PHF         0.92           0.92
Peak 15-minute volume, v15      152            161
Trucks and buses               5      %      5      %
Recreational vehicles          0      %      0      %
Terrain type              Level          Level
   Grade                  0.00    %      0.00    %
   Segment length            0.00    mi     0.00    mi
```

```
Number of lanes                   2               2
Driver population adjustment, fP     1.00            1.00
Trucks and buses PCE, ET          1.5             1.5
Recreational vehicles PCE, ER       1.2             1.2
Heavy vehicle adjustment, fHV       0.976           0.976
Flow rate, vp                    311      pcphpl   329      pcphpl

_____________________________________RESULTS_____________________________________

           Direction          1               2
Flow rate, vp                    311      pcphpl   329      pcphpl
Free-flow speed, FFS                55.0     mph      55.0     mph
Avg. passenger-car travel speed, S   55.0     mph      55.0     mph
Level of service, LOS               A               A
Density, D                       5.7      pc/mi/ln 6.0      pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp              55              55
Percent of segment with occupied
on-highway parking                  0               0
Pavement rating, P                  3               3
Flow rate in outside lane, vOL      303.8           321.2
Effective width of outside lane, We  24.00           24.00
Effective speed factor, St          4.79            4.79
Bicycle LOS Score, BLOS             3.07            3.10
Bicycle LOS                         C               C

  Overall results are not computed when free-flow speed is less than 45 mph.
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Phone:                          Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Belle Haven Dr/SR 41
Jurisdiction           Kings County
Analysis Year          2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft    % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level         % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       20      %
      Up/down        -       %      Access point density     8       /mi

Analysis direction volume, Vd  486     veh/h
Opposing direction volume, Vo  572     veh/h

___________________________Average Travel Speed______________________________

Direction                        Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.2                1.1
PCE for RVs, ER                          1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.988              0.994
Grade adj. factor,(note-1) fg            1.00               1.00
Directional flow rate,(note-2) vi         535     pc/h       625     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                     58.0    mi/h

Adjustment for no-passing zones, fnp          1.0     mi/h
Average travel speed, ATSd                48.0    mi/h
Percent Free Flow Speed, PFFS              82.8    %




_________________________Percent Time-Spent-Following_________________________

Direction                   Analysis(d)        Opposing (o)
PCE for trucks, ET                  1.0               1.0
PCE for RVs, ER                     1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000             1.000
Grade adjustment factor,(note-1) fg       1.00              1.00
Directional flow rate,(note-2) vi         528    pc/h        622     pc/h
Base percent time-spent-following,(note-4) BPTSFd  53.9   %
Adjustment for no-passing zones, fnp             24.5
Percent time-spent-following, PTSFd              65.1   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                      C
Volume to capacity ratio, v/c                0.31
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                       1690    veh/h
Capacity from PTSF, CdPTSF                     1700    veh/h
Directional Capacity                       1690    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                      0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                     48.0    mi/h
Percent time-spent-following, PTSFd (from above)             65.1
Level of service, LOSd (from above)                         C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                  -
Percent time-spent-following
    including passing lane, PTSFpl                      -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -      veh-h

___________________________ Bicycle Level of Service ___________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                               3
Flow rate in outside lane, vOL                       528.3
Effective width of outside lane, We                    24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                              3.66
Bicycle LOS                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                        Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst               Shalisha Hodson
Agency/Co.              R&S Civil
Date Performed          12/14/2020
Analysis Time Period    PM
Highway                 Bush Street
From/To                 College Ave/Semas Dr
Jurisdiction            Kings County
Analysis Year           2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3          Peak hour factor, PHF    0.92
Shoulder width      6.0    ft    % Trucks and buses       6      %
Lane width         12.0    ft    % Trucks crawling        0.0    %
Segment length      0.0    mi    Truck crawl speed        0.0    mi/hr
Terrain type        Level        % Recreational vehicles  4      %
Grade:  Length      -      mi    % No-passing zones       20     %
     Up/down        -      %     Access point density     8      /mi

Analysis direction volume, Vd  705     veh/h
Opposing direction volume, Vo  635     veh/h

____________________________Average Travel Speed______________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                  1.1               1.1
PCE for RVs, ER                     1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.994
Grade adj. factor,(note-1) fg           1.00              1.00
Directional flow rate,(note-2) vi         771     pc/h        694     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM            -      mi/h
Observed total demand,(note-3) V              -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA     2.0     mi/h
```

```
Free-flow speed, FFSd                    58.0    mi/h

Adjustment for no-passing zones, fnp          0.8     mi/h
Average travel speed, ATSd                  45.8    mi/h
Percent Free Flow Speed, PFFS                79.0    %




_________________________Percent Time-Spent-Following_________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                      1.0               1.0
PCE for RVs, ER                         1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         766    pc/h         690     pc/h
Base percent time-spent-following,(note-4) BPTSFd  66.6   %
Adjustment for no-passing zones, fnp              19.1
Percent time-spent-following, PTSFd               76.6   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                         C
Volume to capacity ratio, v/c                   0.45
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15              0.0     veh-h
Capacity from ATS, CdATS                        1690    veh/h
Capacity from PTSF, CdPTSF                       1700    veh/h
Directional Capacity                          1690    veh/h

____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                -       mi
Average travel speed, ATSd (from above)                   45.8    mi/h
Percent time-spent-following, PTSFd (from above)            76.6
Level of service, LOSd (from above)                       C

___________________Average Travel Speed  with Passing Lane___________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                            -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________
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```
Downstream length of two-lane highway within effective length
   of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
   the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
   on percent time-spent-following, fpl                 -
Percent time-spent-following
   including passing lane, PTSFpl                      -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15               -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                             55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                 3
Flow rate in outside lane, vOL                         766.3
Effective width of outside lane, We                    24.00
Effective speed factor, St                         4.79
Bicycle LOS Score, BLOS                                3.85
Bicycle LOS                                       D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

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Phone:                         Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst              Shalisha Hodson
Agency/Co.             R&S Civil
Date Performed         12/14/2020
Analysis Time Period    PM
Highway                Bush Street
From/To                Semas Dr/Belle Haven Dr
Jurisdiction           Kings County
Analysis Year          2040+Project
Description  Community College Expansion

__________________________________Input Data__________________________________

Highway class  Class 3           Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width          12.0     ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length        -      mi     % No-passing zones       20      %
        Up/down       -      %      Access point density     8       /mi

Analysis direction volume, Vd  414     veh/h
Opposing direction volume, Vo  391     veh/h

____________________________Average Travel Speed______________________________

Direction                          Analysis(d)        Opposing (o)
PCE for trucks, ET                       1.3               1.3
PCE for RVs, ER                          1.0               1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.982              0.982
Grade adj. factor,(note-1) fg            1.00              1.00
Directional flow rate,(note-2) vi         458     pc/h      433     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM               -      mi/h
Observed total demand,(note-3) V                 -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0      mi/h
Adj. for access point density,(note-3) fA      2.0     mi/h
```

```
Free-flow speed, FFSd                      58.0    mi/h

Adjustment for no-passing zones, fnp          1.3     mi/h
Average travel speed, ATSd                  49.8    mi/h
Percent Free Flow Speed, PFFS                85.8    %




_____________________________Percent Time-Spent-Following_____________________________

Direction                      Analysis(d)        Opposing (o)
PCE for trucks, ET                    1.0               1.0
PCE for RVs, ER                       1.0               1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         450    pc/h         425     pc/h
Base percent time-spent-following,(note-4) BPTSFd  46.2   %
Adjustment for no-passing zones, fnp              31.4
Percent time-spent-following, PTSFd               62.3   %

___________________Level of Service and Other Performance Measures_________________

Level of service, LOS                        B
Volume to capacity ratio, v/c                  0.27
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15               0.0     veh-h
Capacity from ATS, CdATS                          1669    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                         1669    veh/h

_________________________________Passing Lane Analysis_________________________________

Total length of analysis segment, Lt                        0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      49.8    mi/h
Percent time-spent-following, PTSFd (from above)             62.3
Level of service, LOSd (from above)                          B

______________________Average Travel Speed  with Passing Lane______________________

Downstream length of two-lane highway within effective
   length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
   length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
   on average speed, fpl                          -
Average travel speed including passing lane, ATSpl          -
Percent free flow speed including passing lane, PFFSpl       0.0     %

___________________Percent Time-Spent-Following with Passing Lane__________________
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```
Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                   -
Percent time-spent-following
    including passing lane, PTSFpl                       -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp                              55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                3
Flow rate in outside lane, vOL                        450.0
Effective width of outside lane, We                     24.00
Effective speed factor, St                          4.79
Bicycle LOS Score, BLOS                               3.58
Bicycle LOS                                      D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

QUEUE LENGTH ANALYSIS

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	WB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	66	50	39
Average Queue (ft)	20	10	14
95th Queue (ft)	47	32	33
Link Distance (ft)		1122	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	250		500
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	WB	NB	NB
Directions Served	L	TR	L	R
Maximum Queue (ft)	51	18	72	116
Average Queue (ft)	11	1	42	47
95th Queue (ft)	36	6	64	78
Link Distance (ft)		540	1327	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			300
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	51	68	30	58
Average Queue (ft)	2	21	10	20
95th Queue (ft)	17	46	30	39
Link Distance (ft)	397		1172	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	49	74	72
Average Queue (ft)	13	38	45
95th Queue (ft)	36	61	70
Link Distance (ft)		1210	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		300
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	20	47	50	48
Average Queue (ft)	1	19	14	18
95th Queue (ft)	7	41	36	36
Link Distance (ft)	547		977	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	WB	NB	NB
Directions Served	L	TR	L	R
Maximum Queue (ft)	28	21	96	119
Average Queue (ft)	9	1	42	58
95th Queue (ft)	30	10	74	98
Link Distance (ft)		494	1242	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			300
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	20	66	28	47
Average Queue (ft)	2	23	9	21
95th Queue (ft)	11	46	27	37
Link Distance (ft)	407		896	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	68	114	114
Average Queue (ft)	16	47	55
95th Queue (ft)	44	84	90
Link Distance (ft)		874	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		300
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	21	68	48	60
Average Queue (ft)	4	35	17	19
95th Queue (ft)	17	61	39	38
Link Distance (ft)	435		1130	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	53	183	272
Average Queue (ft)	23	99	130
95th Queue (ft)	48	182	218
Link Distance (ft)		1211	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		300
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	21	86	25	70
Average Queue (ft)	3	34	9	23
95th Queue (ft)	16	60	28	44
Link Distance (ft)	840		1230	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	51	353	325
Average Queue (ft)	16	90	126
95th Queue (ft)	43	198	246
Link Distance (ft)		1525	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		300
Storage Blk Time (%)			1
Queuing Penalty (veh)			2

Network Summary

Network wide Queuing Penalty: 2

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	22	68	93	72
Average Queue (ft)	1	34	36	26
95th Queue (ft)	10	57	66	49
Link Distance (ft)	424		1349	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	27	112	49
Average Queue (ft)	11	48	26
95th Queue (ft)	31	89	44
Link Distance (ft)		1149	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		300
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	28	177	94	59
Average Queue (ft)	2	40	28	27
95th Queue (ft)	14	92	58	41
Link Distance (ft)	425		1007	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	WB	NB	NB
Directions Served	L	TR	L	R
Maximum Queue (ft)	50	19	94	66
Average Queue (ft)	18	2	58	29
95th Queue (ft)	41	11	88	44
Link Distance (ft)		438	1083	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			300
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	38	93	74	53
Average Queue (ft)	3	41	28	26
95th Queue (ft)	16	77	55	45
Link Distance (ft)	398		1173	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	27	115	53
Average Queue (ft)	12	58	29
95th Queue (ft)	33	94	41
Link Distance (ft)		1186	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	100		300
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	21	90	74	58
Average Queue (ft)	3	40	36	29
95th Queue (ft)	14	70	71	43
Link Distance (ft)	507		870	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	WB	NB	NB
Directions Served	L	TR	L	R
Maximum Queue (ft)	46	46	225	52
Average Queue (ft)	12	2	88	32
95th Queue (ft)	35	15	175	47
Link Distance (ft)		562	854	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			300
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	34	164	184	54
Average Queue (ft)	8	69	64	30
95th Queue (ft)	26	126	139	54
Link Distance (ft)	699		955	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	WB	WB	NB	NB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	50	21	48	454	325
Average Queue (ft)	18	1	2	410	325
95th Queue (ft)	42	7	18	429	325
Link Distance (ft)		687	687	391	
Upstream Blk Time (%)				96	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)	100				300
Storage Blk Time (%)				96	0
Queuing Penalty (veh)				130	1

Network Summary

Network wide Queuing Penalty: 131

Intersection: 4: SR 41 SB Ramps & Bush St

Movement	EB	WB	SB	SB
Directions Served	TR	L	L	R
Maximum Queue (ft)	33	156	133	87
Average Queue (ft)	6	75	49	34
95th Queue (ft)	23	132	98	58
Link Distance (ft)	408		1028	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		250		500
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: SR 41 NB Ramps & Bush St

Movement	EB	WB	NB	NB
Directions Served	L	TR	L	R
Maximum Queue (ft)	49	19	414	325
Average Queue (ft)	22	3	393	284
95th Queue (ft)	46	14	411	456
Link Distance (ft)		507	375	
Upstream Blk Time (%)			90	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	100			300
Storage Blk Time (%)			94	0
Queuing Penalty (veh)			128	1

Network Summary

Network wide Queuing Penalty: 129

VEHICLE TURNING MOVEMENT COUNTS

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
ND Engineering
6807 Leameadow
Dallas, TX 75248

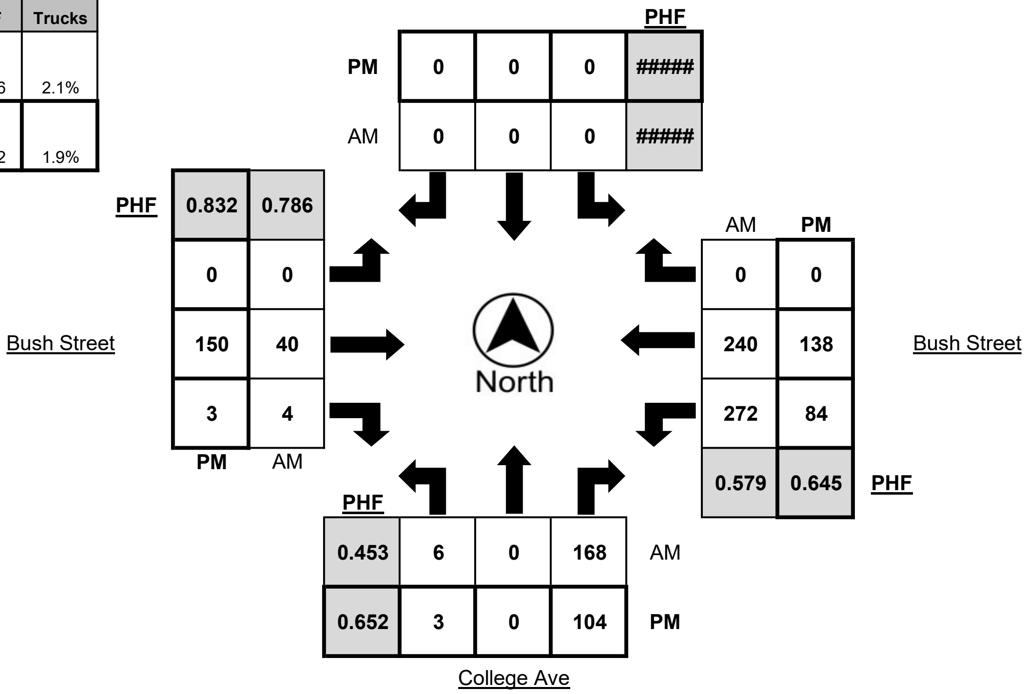
LOCATION Bush St @ College Ave
LATITUDE 36.2945
COUNTY Kings
LONGITUDE -119.8216
COLLECTION DATE Wednesday, August 29, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	1	0	9	1	0	0	0	0	0	3	0	0	19	19	0	1
7:15 AM - 7:30 AM	0	0	8	0	0	0	0	0	0	8	0	0	50	39	0	2
7:30 AM - 7:45 AM	2	0	42	2	0	0	0	0	0	13	1	0	75	47	0	2
7:45 AM - 8:00 AM	2	0	94	1	0	0	0	0	0	10	1	1	107	114	0	0
8:00 AM - 8:15 AM	2	0	24	4	0	0	0	0	0	9	2	0	40	40	0	3
8:15 AM - 8:30 AM	2	0	17	1	0	0	0	0	0	13	2	0	30	17	0	2
8:30 AM - 8:45 AM	3	0	31	2	0	0	0	0	0	11	2	0	69	65	0	3
8:45 AM - 9:00 AM	6	0	32	2	0	0	0	0	0	33	4	0	66	141	0	1
TOTAL	**18**	**0**	**257**	**13**	**0**	**0**	**0**	**0**	**0**	**100**	**12**	**1**	**456**	**482**	**0**	**14**

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	1	0	33	0	0	0	0	0	0	14	2	0	13	25	0	1
4:15 PM - 4:30 PM	0	0	14	1	0	0	0	0	0	20	0	0	17	12	0	1
4:30 PM - 4:45 PM	2	0	32	2	0	0	0	0	0	18	3	0	24	11	0	2
4:45 PM - 5:00 PM	3	0	32	0	0	0	0	0	0	46	0	0	29	57	0	1
5:00 PM - 5:15 PM	0	0	41	2	0	0	0	0	0	44	2	0	18	27	0	2
5:15 PM - 5:30 PM	0	0	13	0	0	0	0	0	0	23	0	0	20	34	0	0
5:30 PM - 5:45 PM	0	0	18	2	0	0	0	0	0	37	1	0	17	20	0	2
5:45 PM - 6:00 PM	2	0	19	0	0	0	0	0	0	26	1	0	9	24	0	0
TOTAL	**8**	**0**	**202**	**7**	**0**	**0**	**0**	**0**	**0**	**228**	**9**	**0**	**147**	**210**	**0**	**9**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	6	0	168	7	0	0	0	0	0	40	4	1	272	240	0	7
4:45 PM - 5:45 PM	3	0	104	4	0	0	0	0	0	150	3	0	84	138	0	5

	PHF	Trucks
AM	0.556	2.1%
PM	0.722	1.9%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

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Turning Movement Report

Prepared For:
ND Engineering
6807 Leameadow
Dallas, TX 75248

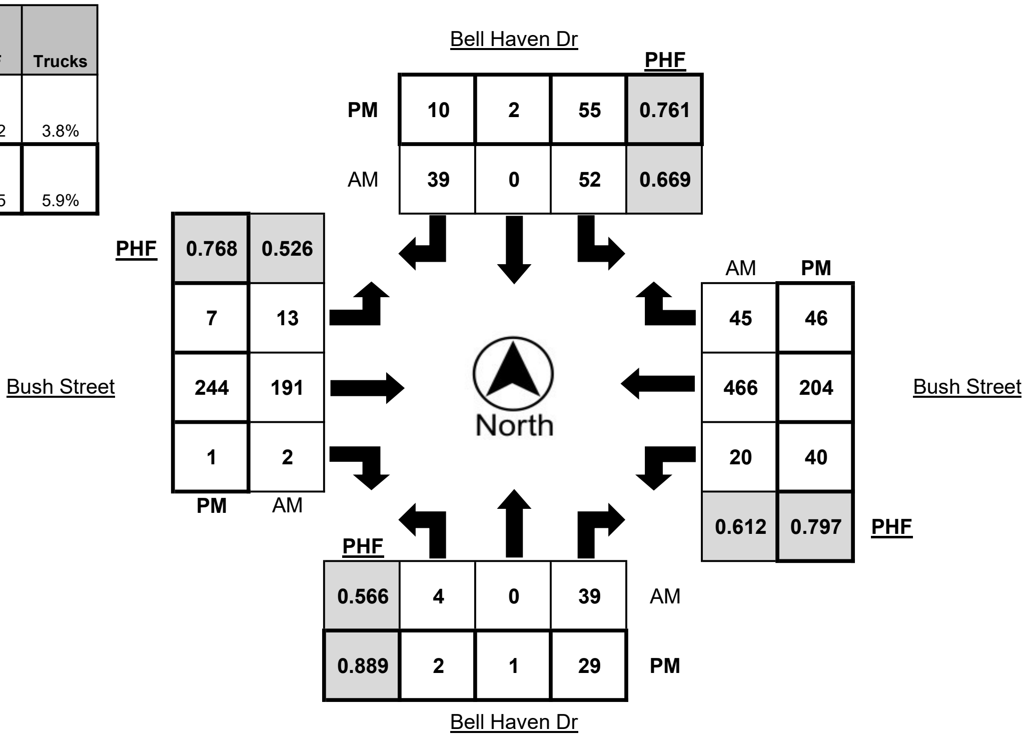
LOCATION Bush St @ Belle Haven Dr
LATITUDE 36.2962
COUNTY Kings
LONGITUDE -119.8129
COLLECTION DATE Wednesday, August 29, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	0	5	1	17	0	3	2	3	9	0	1	0	41	12	3
7:15 AM - 7:30 AM	1	0	8	0	13	0	7	3	0	20	0	0	6	89	11	6
7:30 AM - 7:45 AM	1	0	11	1	16	0	9	3	4	54	0	2	5	122	12	3
7:45 AM - 8:00 AM	2	0	17	0	15	0	19	2	9	87	2	1	5	202	10	3
8:00 AM - 8:15 AM	0	0	3	1	8	0	4	2	0	30	0	4	4	53	12	2
8:15 AM - 8:30 AM	0	0	9	0	9	1	2	5	0	31	1	2	3	48	7	5
8:30 AM - 8:45 AM	2	0	6	0	4	0	4	1	0	43	0	2	3	147	11	4
8:45 AM - 9:00 AM	2	1	3	0	10	0	16	3	0	60	2	1	4	182	14	7
TOTAL	**8**	**1**	**62**	**3**	**92**	**1**	**64**	**21**	**16**	**334**	**5**	**13**	**30**	**884**	**89**	**33**

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	0	5	0	14	1	0	2	0	46	1	1	8	30	5	2
4:15 PM - 4:30 PM	0	0	6	0	19	0	2	5	1	35	0	0	9	28	7	2
4:30 PM - 4:45 PM	0	0	5	0	20	0	3	1	0	54	0	2	12	43	11	6
4:45 PM - 5:00 PM	1	0	8	0	15	0	2	2	1	81	0	0	6	76	9	5
5:00 PM - 5:15 PM	0	0	8	0	6	0	3	1	3	73	0	2	12	45	13	5
5:15 PM - 5:30 PM	1	0	5	1	17	0	5	5	2	30	1	0	13	47	9	2
5:30 PM - 5:45 PM	0	1	8	0	17	2	0	5	1	60	0	2	9	36	15	8
5:45 PM - 6:00 PM	0	0	4	0	7	1	0	0	1	39	0	0	12	26	9	0
TOTAL	**2**	**1**	**49**	**1**	**115**	**4**	**15**	**21**	**9**	**418**	**2**	**7**	**81**	**331**	**78**	**30**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	4	0	39	2	52	0	39	10	13	191	2	7	20	466	45	14
4:45 PM - 5:45 PM	2	1	29	1	55	2	10	13	7	244	1	4	40	204	46	20

	PHF	Trucks
AM	0.592	3.8%
PM	0.805	5.9%



Metro Traffic Data Inc.
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Turning Movement Report

Prepared For:

ND Engineering
6807 Leameadow
Dallas, TX 75248

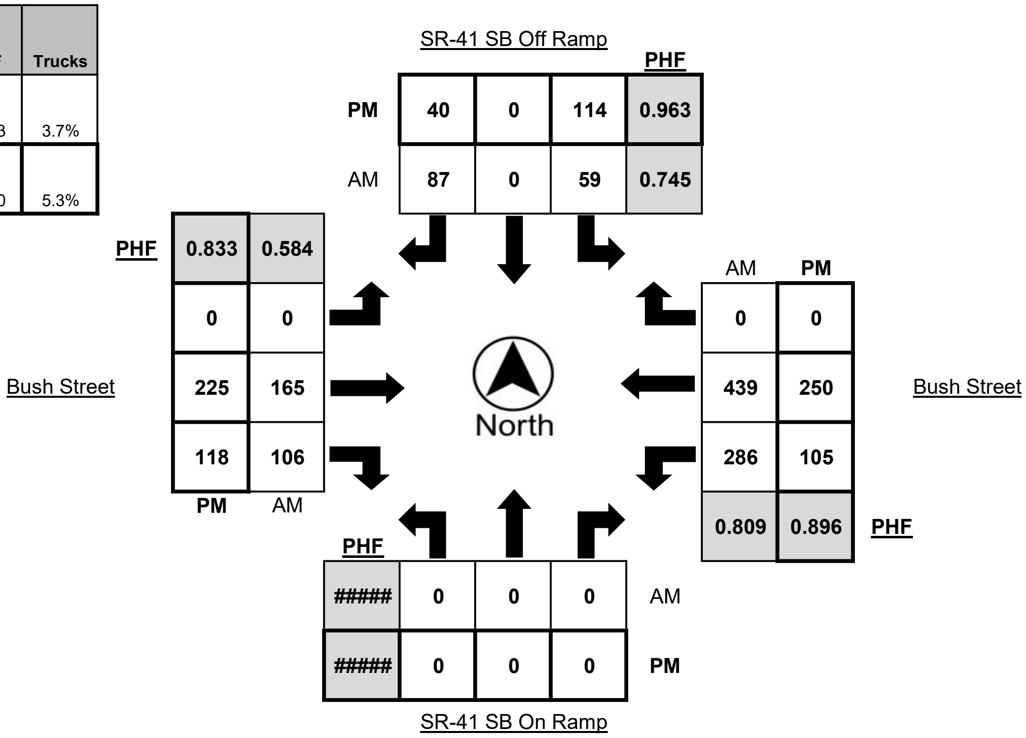
LOCATION Bush St @ SR-41 SB Ramps
LATITUDE 36.2964
COUNTY Kings
LONGITUDE -119.8116
COLLECTION DATE Wednesday, August 29, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	0	0	0	16	0	13	3	0	14	14	5	81	48	0	4
7:15 AM - 7:30 AM	0	0	0	0	14	0	10	2	0	20	20	2	88	100	0	8
7:30 AM - 7:45 AM	0	0	0	0	18	0	31	1	0	64	23	6	71	113	0	4
7:45 AM - 8:00 AM	0	0	0	0	11	0	33	1	0	67	49	2	46	178	0	4
8:00 AM - 8:15 AM	0	0	0	0	10	0	15	0	0	28	12	7	30	53	0	2
8:15 AM - 8:30 AM	0	0	0	0	10	0	7	2	0	31	18	6	23	57	0	8
8:30 AM - 8:45 AM	0	0	0	0	12	0	29	2	0	41	13	3	22	138	0	7
8:45 AM - 9:00 AM	0	0	0	0	19	0	37	3	0	50	27	4	26	163	0	9
TOTAL	**0**	**0**	**0**	**0**	**110**	**0**	**175**	**14**	**0**	**315**	**176**	**35**	**387**	**850**	**0**	**46**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	0	0	0	27	0	8	0	0	44	18	3	24	43	0	3
4:15 PM - 4:30 PM	0	0	0	0	30	0	10	0	0	38	22	4	20	34	0	2
4:30 PM - 4:45 PM	0	0	0	0	35	0	12	1	0	52	27	3	20	55	0	6
4:45 PM - 5:00 PM	0	0	0	0	25	0	15	0	0	68	35	2	21	78	0	6
5:00 PM - 5:15 PM	0	0	0	0	27	0	8	0	0	73	29	5	15	56	0	5
5:15 PM - 5:30 PM	0	0	0	0	27	0	13	1	0	34	17	7	40	58	0	4
5:30 PM - 5:45 PM	0	0	0	0	35	0	4	2	0	50	37	6	29	58	0	7
5:45 PM - 6:00 PM	0	0	0	0	27	0	10	0	0	37	14	0	19	35	0	2
TOTAL	**0**	**0**	**0**	**0**	**233**	**0**	**80**	**4**	**0**	**396**	**199**	**30**	**188**	**417**	**0**	**35**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	0	0	0	0	59	0	87	7	0	165	106	15	286	439	0	20
4:45 PM - 5:45 PM	0	0	0	0	114	0	40	3	0	225	118	20	105	250	0	22

	PHF	Trucks
AM	0.743	3.7%
PM	0.880	5.3%



Metro Traffic Data Inc.
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Hanford, CA 93230

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Turning Movement Report

Prepared For:

ND Engineering
6807 Leameadow
Dallas, TX 75248

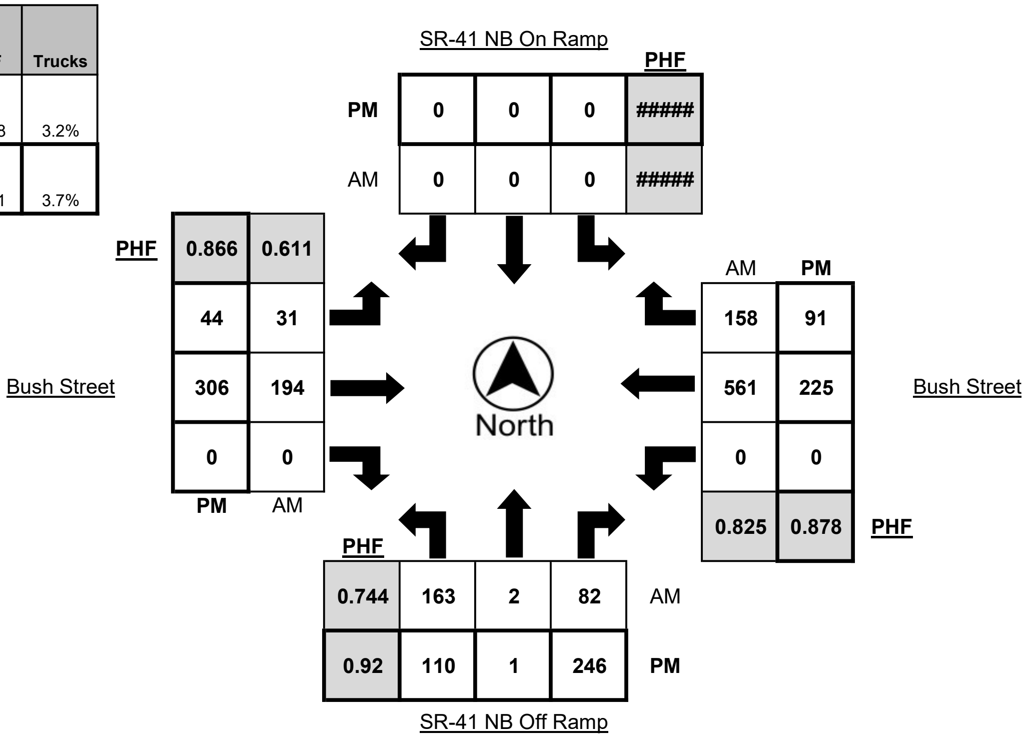
LOCATION Bush St @ SR-41 NB Ramps
LATITUDE 36.2966
COUNTY Kings
LONGITUDE -119.8099
COLLECTION DATE Wednesday, August 29, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	24	0	11	3	0	0	0	0	1	31	0	2	0	109	32	3
7:15 AM - 7:30 AM	48	2	16	5	0	0	0	0	3	28	0	1	0	129	51	4
7:30 AM - 7:45 AM	41	0	22	2	0	0	0	0	15	55	0	2	0	138	42	5
7:45 AM - 8:00 AM	50	0	33	3	0	0	0	0	12	80	0	4	0	185	33	4
8:00 AM - 8:15 AM	24	0	27	1	0	0	0	0	7	33	0	2	0	74	23	4
8:15 AM - 8:30 AM	24	0	20	4	0	0	0	0	8	31	0	4	0	50	25	4
8:30 AM - 8:45 AM	55	0	16	3	0	0	0	0	6	46	0	2	0	90	12	4
8:45 AM - 9:00 AM	64	0	16	4	0	0	0	0	14	54	0	3	0	135	11	5
TOTAL	**330**	**2**	**161**	**25**	**0**	**0**	**0**	**0**	**66**	**358**	**0**	**20**	**0**	**910**	**229**	**33**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	15	0	47	2	0	0	0	0	11	63	0	1	0	50	31	3
4:15 PM - 4:30 PM	14	0	17	2	0	0	0	0	6	50	0	1	0	41	30	2
4:30 PM - 4:45 PM	24	0	61	7	0	0	0	0	12	74	0	3	0	42	21	2
4:45 PM - 5:00 PM	35	0	62	6	0	0	0	0	11	86	0	2	0	63	27	2
5:00 PM - 5:15 PM	27	1	69	1	0	0	0	0	16	85	0	1	0	51	24	6
5:15 PM - 5:30 PM	24	0	54	2	0	0	0	0	5	61	0	4	0	69	19	2
5:30 PM - 5:45 PM	23	0	43	3	0	0	0	0	9	59	0	1	0	57	27	4
5:45 PM - 6:00 PM	19	0	40	2	0	0	0	0	5	68	0	2	0	51	18	1
TOTAL	**181**	**1**	**393**	**25**	**0**	**0**	**0**	**0**	**75**	**546**	**0**	**15**	**0**	**424**	**197**	**22**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	163	2	82	13	0	0	0	0	31	194	0	9	0	561	158	16
4:30 PM - 5:30 PM	110	1	246	16	0	0	0	0	44	306	0	10	0	225	91	12

	PHF	**Trucks**
AM	0.758	3.2%
PM	0.901	3.7%



				PHF
PM	**0**	**0**	**0**	**#####**
AM	**0**	**0**	**0**	**#####**

PHF	**0.866**	**0.611**
	44	**31**
	306	**194**
	0	**0**
	PM	AM

AM	**PM**	
158	**91**	
561	**225**	
0	**0**	
0.825	**0.878**	PHF

PHF				
0.744	**163**	**2**	**82**	AM
0.92	**110**	**1**	**246**	**PM**

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
ND Engineering
6807 Leameadow
Dallas, TX 75248

LOCATION Bush St @ 19 1/2 Ave

LATITUDE 36.2983

COUNTY Kings

LONGITUDE -119.8078

COLLECTION DATE Wednesday, August 29, 2018

WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	29	10	3	0	7	7	69	2	14	15	12	1	4	41	1	3
7:15 AM - 7:30 AM	40	14	7	1	6	10	82	0	14	18	9	2	5	62	7	3
7:30 AM - 7:45 AM	49	10	5	3	13	17	64	2	23	26	22	3	7	65	8	3
7:45 AM - 8:00 AM	70	19	4	3	6	25	79	2	47	63	24	6	6	64	6	1
8:00 AM - 8:15 AM	26	10	4	0	8	16	24	2	26	23	11	3	5	43	8	3
8:15 AM - 8:30 AM	20	11	8	0	3	4	27	2	18	23	10	4	1	26	3	2
8:30 AM - 8:45 AM	26	7	6	1	4	8	43	2	23	24	13	3	6	40	0	2
8:45 AM - 9:00 AM	42	5	5	2	4	5	45	1	20	28	22	4	7	53	1	1
TOTAL	**302**	**86**	**42**	**10**	**51**	**92**	**433**	**13**	**185**	**220**	**123**	**26**	**41**	**394**	**34**	**18**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	16	10	2	0	6	8	22	1	41	47	16	0	7	45	6	3
4:15 PM - 4:30 PM	16	12	5	0	2	9	17	0	47	47	17	1	6	37	5	2
4:30 PM - 4:45 PM	18	9	4	0	4	6	18	1	37	42	30	3	2	27	2	1
4:45 PM - 5:00 PM	20	10	5	1	4	6	29	1	64	60	28	6	3	39	2	1
5:00 PM - 5:15 PM	22	12	4	3	4	16	25	0	63	54	29	1	3	26	5	2
5:15 PM - 5:30 PM	20	18	4	1	3	9	33	0	51	43	28	3	8	35	5	1
5:30 PM - 5:45 PM	18	17	6	0	5	11	31	2	29	42	26	1	4	40	4	2
5:45 PM - 6:00 PM	16	13	4	1	8	12	19	0	44	54	10	2	8	31	5	0
TOTAL	**146**	**101**	**34**	**6**	**36**	**77**	**194**	**5**	**376**	**389**	**184**	**17**	**41**	**280**	**34**	**12**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	188	53	19	7	32	59	294	6	98	122	67	12	22	232	22	10
4:45 PM - 5:45 PM	80	57	19	5	16	42	118	3	207	199	111	11	18	140	16	6

	PHF	Trucks
AM	0.731	2.9%
PM	0.947	2.4%