APPENDICES

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APPENDIX A

OFF-RESERVATION ENVIRONMENTAL IMPACT ANALYSIS CHECKLIST

TACHI PALACE HOTEL & CASINO EXPANSION PROJECT OFF-RESERVATION ENVIRONMENTAL IMPACT ANALYSIS CHECKLIST

I. AESTHETICS

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage off-reservation scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). 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, which would adversely affect day or nighttime views of historic buildings or views in the area?	☐	☒	☐	☐

See Section 3.2, Aesthetics.

II. AGRICULTURAL RESOURCES

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*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 non-agricultural 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 non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

A-B According to the California Department of Conservation, Important Farmland Finder, APN 024-160-024 is designated as Farmland of Statewide Importance in the 2016 update[1]. The remaining APNs are designated as Urban and Built-Up Land and are not considered farmland of importance. Although APN 024-160-024 is designated as Farmland of Statewide Importance, the site currently supports the existing Santa Rosa Rancheria Event center and parking area. Project activities would be limited to the existing footprint of the Tachi Palace Hotel and Casino; no expansion would occur. Therefore, no new impacts to conversion of farmland would occur.

C-D The Site is not zoned for forest land as defined in Public Resources Code section 12220(g), nor is it designated as timberland.

E The Santa Rosa Rancheria Tribal Land is not subject to any land use authority. The 2035 Kings County General Plan states that the County of Kings retains land use authority and jurisdiction over all territories within the county except for four incorporated cities and two federal territories, one of which includes the Santa Rosa Rancheria Tribal land[2]. Currently the following APNs are identified in the general plan and zoning district as AG20, 024-160-024, -005, and -006[3]. The land use designation AG20 represents General Agriculture – 20 acres (North County) in the Kings County General plan and is intended for rural areas reserved for commercial agricultural uses. However, the General plan also states that the Santa Rosa Rancheria Tribal Trust Land is excluded from this designation; Page LU-13 of the 2035 Kings County General Plan.

III. AIR QUALITY

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*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 non-attainment under an applicable federal or state ambient air quality standard?	☐	☒	☐	☐
c) Expose off-reservation sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d) Result in other emissions (such as those leading to odors affecting a substantial number of people off-reservation?	☐	☒	☐	☐

See Section 3.3, Air Quality.

[1] CA Farmland Conservancy, 2016. *California Important Farmland Finder*. Available online at: https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed on March 3, 2020.
[2] 2035 Kings County General Plan, 2010. January 26, 2010. *Land Use Element.* Available online at: http://www.countyofkings.com/home/showdocument?id=3110. Accessed on March 3, 2020.
[3] Kings County Map Viewer, 2020. Available online at: http://kingscountygis.com/parcel_query/. Accessed on March 3, 2020.

IV. BIOLOGICAL RESOURCES

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Have a substantial adverse impact, either directly or through habitat modifications, on any species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any off-reservation riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish or U.S. Fish and U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on state or federally protected off-reservation 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?	☐	☐	☐	☒

The Proposed Project would not have any impact on off-reservation biological resources with the exception of indirect impacts from proposed mitigation (refer to Section 3.11.7), and no off-reservation habitat modifications or impacts will occur as a result of the Proposed Project, because no off-site construction would occur.

V. CULTURAL RESOURCES

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☐	☐	☒
c) Disturb any off-reservation human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

The Proposed Project would not have any impact on off-reservation cultural resources with the exception of indirect impacts from proposed mitigation (refer to Section 3.11.8), as no off-reservation construction will occur.

VI. ENERGY

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Result in 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?	☐	☐	☒	☐

A-B During construction there would be a temporary consumption of energy resources for the movement of equipment and materials. However, the duration would be short term, and the area of construction would be limited to the existing Project site footprint. Construction equipment would not be left unattended and would thereby limit engine idling times and reduce short-term energy demand during the project's construction. There are no unusual project characteristics or construction processes that would require the use of equipment that would be more energy intensive than if used for comparable activities. Construction activities would utilize equipment conformed to current emissions standards and related fuel efficiencies. Furthermore, the Proposed Project would meet the building and safety codes of the Tribe as outlined in the September 1999 Tribal-State Compact between the State of California and the Santa Rosa Rancheria[4]. The Tribe would amend its existing building and safety codes to meet the standards of the building and safety codes of the Uniform Building Codes in effect provided that nothing confers with the jurisdiction upon any county or the State with respect to any reference to such building and safety codes. Construction and expansion of facilities would utilized aspects from the California Green Building Standards Code[5] (CALGreen Code). The 2020 CALGreen Code includes mandatory measures for non-residential development related to site development such as energy efficiency[6]. Additional explanation of impacts related to energy have been further identified and addressed in Sections 3.3, Air Quality and 3.9, Transportation of the Environmental Evaluation.

VII. GEOLOGY AND SOILS

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Directly or indirectly cause potential substantial off-reservation 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	☐	☐	☐	☒

[4] Source: Santa Rosa Rancheria, 1999. *Tribal-State Compact between the State of California and the Santa Rosa Rancheria*.
[5] California Code of Regulations (CCR), Title 24, Part 11
[6] Source: CalGreen, 2019. *Guide to the 2019 California Green Building Standards Code*. Available online at: https://codes.iccsafe.org/content/CAGBSC2019/cover. Accessed on February 26, 2020.

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
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 off-reservation 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 off-site 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 direct or indirect risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☒	☐
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

Project Soils are comprised of three different soil types according to the February 2020 Soil Resource Report generated using the United States Department of Agriculture (USDA) Natural Resources Conservation Service system[7]. These soils are Grangeville fine sandy loam, saline-alkali, partially drained; Kimberlina fine sandy loam, saline-alkali; and Kimberlina saline alkali-Garces complex.

A-B The Proposed Project is not expected to cause off-reservation geological impacts, nor is it expected to result in off-reservation soil erosion or loss of topsoil.

C-E The Proposed Project is limited to construction activities in a previously graded and developed area and would not introduce new hazards or exacerbate any pre-existing conditions. According to the California Supreme Court decision in December of 2015, CEQA does not require an analysis of impacts that existing environmental conditions may have on project's future users or residents unless they exacerbate hazards that are already present; California Building Industry Association v. Bay Area Air Quality Management District, N. S213478[8]. No new hazard would be introduced and project activities would be achieved with potential to lessen any pre-existing risks through advancements in construction techniques and updated geotechnical studies.

[7] Source: USDA, 2020. February 24, 2020. *Custom Soil Resource Report for Kings County, California.* Natural Resources Conservation Service.
[8] Source: California Building Industry Association v. Bay Area Air Quality Management District, 2015. *No. S213478*. Available online at: https://caselaw.findlaw.com/ca-supreme-court/1721100.html. Accessed on March 5, 2020.

F The Proposed Project would not have off-reservation impacts to resources such as paleontological findings. However, there is a potential for indirect impacts from proposed mitigations (refer to Section 3.12.8), as no off-reservation construction will occur.

VII. GREENHOUSE GAS EMISSIONS

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Generate greenhouse gas emissions, either directly or indirectly, that may have significant impact on the environment?	☐	☒	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☒	☐	☐

See Section 3.4, Greenhouse Gas Emissions.

IX. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Create a significant hazard to the off-reservation public or the off-reservation environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the off-reservation public or the off-reservation environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed off-reservation school?	☐	☐	☐	☒
d) Be located on a site which 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 or excessive noise 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?	☐	☐	☒	☐

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

A-B See Section 3.5, Hazards and Hazardous Materials.

C The Project site is not within one quarter-mile of an off-site school. The closest school site is the Central Elementary School, located at 15783 18th Ave, Lemoore, CA 93245, approximately 0.7 miles northwest of the Project site.

D The Proposed Project is not a site listed for hazardous materials pursuant to Government Code Section 65962.5[9].

E The Project site is not located within two miles of a public airport. The closest airport is the Hanford Municipal Airport located over nine (9) miles northeast of Tachi Palace & Casino.

F Project scope does not entail alterations to the existing emergency access routes. Project construction activities would be limited to the existing developed footprint.

G According to the Cal Fire Fire Hazard Severity Zone (FHSZ) Viewer, the Project site is not in a moderate, high, or very high fire hazard severity zone[10].

X. HYDROLOGY AND WATER QUALITY

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project	☐	☒	☐	☐

[9] Source: Department of Toxic Substances Control, 2020. *Hazardous Waste and Substances Site List*. Available online at: ttps://www.envirostor.dtsc.ca.gov/public/search.asp?page=3&cmd=search&business_name=&main_street_name=&city=&zip=&county=&status=ACT%2CBKLG%2CCOM&branch=&site_type=CSITES%2CFUDS&npl=&funding=&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+%28CORTESE%29&reporttype=CORTESE&federal_superfund=&state_response=&voluntary_cleanup=&school_cleanup=&operating=&post_closure=&non_operating=&corrective_action=&tiered_permit=&evaluation=&spec_prog=&national_priority_list=&senate=&congress=&assembly=&critical_pol=&business_type=&case_type=&searchtype=&hwmp_site_type=&cleanup_type=&ocieerp=&hwmp=False&permitted=&pc_permitted=&inspections=&complaints=&censustract=&cesdecile=&school_district=&orderby=county. Accessed on March 6, 2020.

[10] Source: Cal Fire, 2020. Fire and Resource Assessment Program. *FHSZ* Viewer. Available online at: https://egis.fire.ca.gov/FHSZ/. Accessed on March 6, 2020.

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
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 off-site;	☐	☒	☐	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in 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; or	☐	☒	☐	☐
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?	☐	☒	☐	☐

See Section 3.6, Hydrology and Water Quality.

XI. LAND USE

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Implementation of the Proposed Project would not take place outside federal trust land boundaries; therefore, land use designations do not apply and no adverse off-reservation impacts to land use will occur.

XII. MINERAL RESOURCES

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Result in the loss of availability of a known off-reservation mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of an off-reservation locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Implementation of the Proposed Project would not adversely impact any known off-reservation mineral resources, as no off reservation construction will occur.

XIII. NOISE

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Generation of a substantial off-reservation temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of off-reservation excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) 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?	☐	☐	☒	☐

See Section 3.7, Noise.

XIV. POPULATION AND HOUSING

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Induce substantial unplanned 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 people or housing, necessitating the construction of replacement housing elsewhere off-reservation?	☐	☐	☐	☒

No substantial off-reservation population increases are anticipated as a result of the Proposed Project, and the Proposed Project will not displace off-reservation housing, as no off-reservation construction will occur.

XIV. PUBLIC SERVICES

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) 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 other performance objectives for any of the public services:				
Fire protection?	☐	☒	☐	☐
Police protection?	☐	☒	☐	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

See Section 3.8, Public Services regarding the Proposed Project's impacts on the provision of fire and police protection services. As described in Section 3.11, Socioeconomics, and under Checklist Item XIV, Population and Housing, the Proposed Project is not anticipated to result in a substantial off-reservation population increase within Kings County. Therefore, the Proposed Project is not anticipated to result in a significantly increased demand for schools or other public facilities that would require the construction of new or expanded facilities. Refer to Checklist Item XVI, Recreation, regarding the Proposed Project's impacts on public park facilities.

XVI. RECREATION

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Would the project increase the use of existing off-reservation neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

A-B The Proposed Project will create an expanded entertainment and recreational opportunity in Kings County. This new opportunity will provide a positive impact to recreational opportunities in the County and would greatly offset any incremental impacts to off-reservation recreational areas resulting from additional employees moving to the area. While the increase in patron trips to the area and the

provision of additional overnight accommodations resulting from the Proposed Project may result in an increase in the use of regional recreational facilities such as the North Community Center and the Surf Ranch, the increase would be minor and not sufficient to adversely affect existing recreational facilities or require the construction of new facilities. Project expansion is not expected to have an adverse physical effect on the environment.

XVII. TRANSPORTATION

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

See Section 3.9, Transportation.

XVIII. TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of off-reservation tribal cultural resources, 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:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) 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	☐	☐	☐	☒
b) 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 Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

The Proposed Project would have no impact to off-reservation tribal or cultural resources, Project activities are limited to the existing Tachi Palace & Casino footprint. Therefore, questions A-B are not applicable.

XIX. UTILITIES AND SERVICE SYSTEMS

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Require or result in the relocation or construction of new or expanded water, or 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 which 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?	☐	☒	☐	☐

See Section 3.10, Utilities and Service Systems, Section 2.2.3 Water Supply, and Section 3.6, Hydrology and Water Quality.

XX. WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
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 other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
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?	☐	☐	☐	☒

The Project site is not in or near a state responsibility area, nor is it classified as a very high fire hazard severity zone. According to the Cal Fire FHSZ Viewer, the site is located within a local responsible area and is not classified as either very high, high, or moderate severity zones[11]. Therefore, questions A-D are not applicable.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	*Potentially Significant Impact*	*Less Than Significant With Mitigation Incorporation*	*Less than Significant Impact*	*No Impact*
a) Does the project have the potential to substantially degrade the quality of the off-reservation 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 off-reservation? ("Cumulatively considerable" means that the incremental effects of a project are considerable 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 which will cause (off-reservation) substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

A The Project site is located within the highly developed Tachi Palace & Casino footprint. No expansion of this footprint will occur. The Proposed Project would not have any impact on off-reservation habitat modifications or impacts to plant or animal communities as a result of the Proposed Project, because no off-site construction would occur.

B-C See Sections 3.2 through 3.12 for discussions of cumulative impacts and indirect impacts.

[11] Source: Cal Fire, 2020. Fire and Resource Assessment Program. *FHSZ* Viewer. Available online at: https://egis.fire.ca.gov/FHSZ/. Accessed on March 6, 2020.

APPENDIX B

TRAFFIC IMPACT STUDY

Tachi Palace Hotel & Casino Expansion Project

Traffic Impact Study
May 2020

Prepared by:
VRPA Technologies, Inc.
4630 W. Jennifer, Suite 105
Fresno, CA 93722
Project Manager: Jason Ellard

Tachi Palace Hotel & Casino Expansion Project
Traffic Impact Study

Study Team

- ✓ Georgiena Vivian, President, VRPA Technologies, Inc., gvivian@vrpatechnologies.com, (559) 259-9257
- ✓ Erik Ruehr, Dir. of Traffic Engineering, VRPA Technologies, Inc., eruehr@vrpatechnologies.com, (858) 566-1766
- ✓ Jason Ellard, Transportation Engineer, VRPA Technologies, Inc., jellard@vrpatechnologies.com, (559) 271-1200

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Executive Summary

This Traffic Impact Study (TIS) has been prepared for the purpose of analyzing traffic conditions related to the Tachi Palace Hotel & Casino Expansion Project ("Project") in Kings County. The Project is located along the south side of Jersey Avenue between 17th and 18th Avenues in the northern portion of Kings County. Table E-1 provides a summary of the existing and proposed uses.

Table E-1
Tachi Palace Hotel & Casino Expansion Project

USES	EXISTING	PROPOSED	NET CHANGE
Gaming Space	70,500 sq.ft.	88,500 sq.ft.	18,000 sq. ft.
- Class II and III Gaming Devices	2,108	3,110	1,002
- Table Games	27	27	N/A
- Poker Tables	0	0	N/A
Bingo Hall / Entertainment	26,418 sq. ft. / 1,100 Seats	61,418 sq. ft. / 3,600 Seats	35,000 sq. ft. / 2,500 Seats
Walk Up Bingo Concessions	565 sq. ft.	565 sq. ft.	N/A
Food & Beverage	23,148 sq. ft.	23,148 sq. ft.	N/A
The Market Place @ Pork Chop Hill Buffet	311 Seats / 7,550 sq. ft.	311 Seats / 7,550 sq. ft.	N/A
Red Tail Hawk / Pho-nominal Eats	55 Seats / 1,560 sq. ft.	55 Seats / 1,560 sq. ft.	N/A
Coyote Grille	144 Seats / 2,750 sq. ft.	144 Seats / 2,750 sq. ft.	N/A
Pizza Hut Express	675 sq. ft.	675 sq. ft.	N/A
Rez Dogs	30 Seats / 650 sq. ft.	30 Seats / 650 sq. ft.	N/A
Sunset Lounge	138 Seats / 2,930 sq. ft.	138 Seats / 2,930 sq. ft.	N/A
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Coyote Grille	144 Seats / 2,750 sq. ft.	144 Seats / 2,750 sq. ft.	N/A
Coffee Stop	24 Seats / 450 sq. ft.	24 Seats / 450 sq. ft.	N/A
Wet Bar	40 Seats / 878 sq. ft.	40 Seats / 878 sq. ft.	N/A
Associates Dining Room	155 Seats / 3,556 sq. ft.	155 Seats / 3,556 sq. ft.	N/A
Walk Up Beverage Stations	3	3	N/A
Hospitality / Retail In Casino Floor	1,385 sq. ft.	1,385 sq. ft.	N/A
Back of House	215,967 sq. ft.	215,967 sq. ft.	N/A
Coyote Entertainment Center (includes Sports Bar and Lounge)	82,415 sq. ft.	82,415 sq. ft.	N/A
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Bowling	30 Lanes	30 Lanes	N/A
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Yokut Gas	8,000 sq. ft. Convenience Store	14,000 sq. ft. Convenience Store	6,000 sq. ft.
Gas/Diesel Pumps/110 Octane Fuel Pumps	16 Pumps	40 Pumps	24 Pumps
Racing Fuel Pumps	8 Pumps	8 Pumps	N/A
Electric Charging Stations	2 Stations	2 Stations	N/A
Class II Slot Machines	42	102	60
Car Wash Bays	N/A	3	3
Parking	2,000 Stalls	4,000 Stalls	2,000 Stalls

Access to the existing site is provided by three (3) one-way stop controlled driveways along Jersey Avenue and four (4) one-way stop controlled driveways along 17th Avenue. The main access point to the site is provided along Jersey Avenue, approximately 1,300 feet west of 17th Avenue.

IMPACTS

Intersections

Table E-2 shows intersections that are expected to fall short of desirable operating conditions for various scenarios. Results of the analysis show that the Project will result in a direct project-specific impact at one (1) of the seven (7) study intersections, as shown below, when comparing the Existing and Existing Plus Project scenarios.

- ✓ Jersey Avenue at SR 41

Results of the analysis also show that the Project will result in a cumulative impact at two (2) of the seven (7) study intersections, as shown below, when comparing the Cumulative Year 2043 Without Project and Cumulative Year 2043 Plus Project scenarios.

- ✓ Jersey Avenue at SR 41
- ✓ Jersey Avenue at 18th Avenue

Segments

Table E-3 shows roadway segment analysis results along the existing street and highway system. The performance criteria used for evaluating volumes and capacities on the road and highway system for this study are discussed in Section 1.2.2. Results of the analysis show that all of the roadway segments are projected to operate at acceptable levels of service through the Cumulative Year 2043 Plus Project scenario.

Table E-2
Intersection Operations

INTERSECTION	CONTROL	TARGET LOS	PEAK HOUR	EXISTING PLUS PROJECT		NEAR-TERM PLUS PROJECT		CUMULATIVE YEAR 2043 WITHOUT PROJECT		CUMULATIVE YEAR 2043 PLUS PROJECT	
				DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
1. Jackson Avenue / 16th Avenue	Four-Way Stop Sign	D	FRIDAY PM	8.0	A	8.1	A	7.9	A	8.3	A
			SATURDAY PM	8.2	A	8.3	A	7.9	A	8.3	A
2. Jersey Avenue / SR 41	Two-Way Stop Sign	C	FRIDAY PM	**27.4**	**D +**	**30.2**	**D ++**	**68.4**	**F ++**	**112.1**	**F ++**
			SATURDAY PM	18.7	C	19.8	C	**28.1**	**D ++**	**38.0**	**E ++**
3. Jersey Avenue / 18th Avenue	Four-Way Stop Sign	D	FRIDAY PM	15.8	C	17.2	C	18.6	C	**38.2**	**E ++**
			SATURDAY PM	18.0	C	20.4	C	26.7	D	**69.8**	**F ++**
4. Jersey Avenue / Main Tachi Palace Driveway	One-Way Stop Sign	D	FRIDAY PM	17.5	C	17.8	C	13.7	B	17.4	C
			SATURDAY PM	17.7	C	18.0	C	14.6	B	20.5	C
5. Jersey Avenue / Project Driveway 2	One-Way Stop Sign	D	FRIDAY PM	11.7	B	11.8	B	11.0	B	12.1	B
			SATURDAY PM	12.1	B	12.2	B	11.7	B	13.2	B
6. Jersey Avenue / 17th Avenue	Four-Way Stop Sign	D	FRIDAY PM	10.8	B	11.1	B	10.9	B	13.0	B
			SATURDAY PM	10.9	B	11.3	B	11.5	B	14.7	B
7. Jersey Avenue / 16th Avenue	Two-Way Stop Sign	D	FRIDAY PM	10.9	B	11.1	B	10.7	B	11.5	B
			SATURDAY PM	7.6	A	7.6	A	7.4	A	7.5	A

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For four-way stop intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

+ Does not meet peak hour signal warrants.

++ Meets peak hour signal warrants.

Table E-3
Segment Operations

STREET SEGMENT	SEGMENT DESCRIPTION	TARGET LOS	PEAK HOUR	DIRECTION	EXISTING PLUS PROJECT		NEAR-TERM PLUS PROJECT		CUMULATIVE YEAR 2043 WITHOUT PROJECT		CUMULATIVE YEAR 2043 PLUS PROJECT	
					VOLUME	LOS	VOLUME	LOS	VOLUME	LOS	VOLUME	LOS
16th Avenue												
Jackson Avenue to Jersey Avenue	2 Lanes Undivided	D	Friday PM	NB	86	A	90	A	90	A	120	A
				SB	92	A	95	A	77	A	121	A
			Saturday PM	NB	94	A	98	A	92	A	129	A
				SB	105	A	108	A	85	A	137	A
Jersey Avenue												
SR 41 to 18th Avenue	2 Lanes Undivided	D	Friday PM	EB	140	A	147	A	169	A	204	A
				WB	107	A	113	A	140	A	160	A
			Saturday PM	EB	182	A	191	A	224	A	267	A
				WB	122	A	128	A	152	A	180	A
18th Avenue to 17th Avenue	2 Lanes Undivided	D	Friday PM	EB	458	C	480	C	547	C	666	D
				WB	250	A	261	A	276	B	355	B
			Saturday PM	EB	525	C	550	C	619	C	760	D
				WB	327	B	342	B	368	B	467	C
17th Avenue to 16th Avenue	2 Lanes Undivided	D	Friday PM	EB	169	A	177	A	195	B	243	B
				WB	201	A	210	A	218	A	284	B
			Saturday PM	EB	192	B	201	B	218	B	275	B
				WB	210	A	219	A	216	A	292	B

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

MITIGATION

This section describes potential improvements to mitigate the traffic impacts of the Project. Described below are improvements at study area intersections and segments for various scenarios that would result in acceptable levels of service. In order to mitigate the Project's impacts, it is recommended that the Project contribute traffic impact fees, as determined by Kings County. The payment of these fair-share fees would be used to help fund the applicant's fair-share percentage of the improvements discussed below to mitigate the Project's traffic impacts to less than significant levels.

INTERSECTIONS

✓ Jersey Avenue / SR 41
Recommended improvements to achieve acceptable levels of service:

- Existing Plus Project scenario:
  - Widen the westbound approach to 1 left turn lane and 1 through lane with a shared right (adding 1 left turn lane)

- Near-Term Plus Project and Cumulative Year 2043 Plus Project scenarios:
  - Install Traffic Signal

The improvements identified above for the Existing Plus Project scenario are not sufficient to meet the existing MOE at the intersection. The intersection does not meet the peak hour signal warrant (CA MUTCD Warrant 3) under Existing Plus Project conditions.

The improvements identified above for the Near-Term Plus Project and Cumulative Year 2043 Plus Project scenarios are sufficient to meet the existing MOE at the intersection.

✓ Jersey Avenue / 18th Avenue
Recommended improvements to achieve acceptable levels of service:

- Cumulative Year 2043 Plus Project scenario:
  - Install Traffic Signal

The improvements identified above for the Cumulative Year 2043 Plus Project scenario are sufficient to meet Kings County's level of service criteria as identified in the 2035 General Plan.

Post-Mitigation Level of Significance

The level of service resulting from the potential improvements identified above is shown in Table E-4

Equitable Share Responsibility

The Project will be required to contribute a fair share towards the costs of improvements that are identified for the Cumulative Year 2043 scenario. The intent of determining the equitable responsibility for the improvements identified above for the Cumulative Year 2043 scenario, is to provide a starting point for early discussions between the applicant and the County to address traffic mitigation equitability and to calculate the equitable share for mitigating traffic impacts. The formulas used to calculate the equitable share responsibility is as follows:

Equitable Share = (Project Trips)/(Future Year Plus Project Traffic – Existing Traffic)

Table E-5 shows the Project's equitable share responsibility on a percentage basis for improvements to the study area as described above. The equitable share responsibility shown in Table E-5 is the result of LOS enhancements related to capacity.

Table E-4
Intersection Operations with Mitigation

INTERSECTION	TARGET LOS	PEAK HOUR	EXISTING PLUS PROJECT		NEAR-TERM PLUS PROJECT		CUMULATIVE YEAR 2043 PLUS PROJECT	
			DELAY	LOS	DELAY	LOS	DELAY	LOS
2. Jersey Avenue / SR 41	C	FRIDAY PM	**31.8**	**D +**	9.9	A	12.3	B
		SATURDAY PM	20.7	C	10.5	B	12.7	B
3. Jersey Avenue / 18th Avenue	D	FRIDAY PM					24.4	C
		SATURDAY PM					32.9	C

DELAY is measured in seconds
LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded
+ Does not meet peak hour signal warrants.

Table E-5
Cumulative Year 2043 Equitable Share Responsibility

INTERSECTION	PEAK HOUR	EXISTING	PROJECT TRIPS	CUMULATIVE YEAR 2042 PLUS PROJECT	FAIR SHARE PERCENTAGE
Jersey Avenue / SR 41	FRIDAY PM	939	55	1,569	8.7%
	SATURDAY PM	662	71	1,139	14.9%
Jersey Avenue / 18th Avenue	FRIDAY PM	620	198	1,198	34.3%
	SATURDAY PM	676	240	1,330	36.7%

1.0 Introduction

1.1 Description of the Region/Project

This Traffic Impact Study (TIS) has been prepared for the purpose of analyzing traffic conditions related to the Tachi Palace Hotel & Casino Expansion Project ("Project") in Kings County. The Project is located along the south side of Jersey Avenue between 17th and 18th Avenues in the northern portion of Kings County. The Project seeks to expand its existing operations at the casino. The expansion of the Tachi Palace Hotel & Casino includes the following:

- ✓ Expansion of main casino building to include up to 3,000 Class III gaming machines, as well as office space
- ✓ Addition of 200 hotel rooms
- ✓ New Event/Entertainment space with a seating capacity of 2,500
- ✓ Addition of 2,000 parking stalls
- ✓ Expansion of the existing wastewater treatment facility (size, structure, and capacity)
- ✓ Improvements to the existing gas station, including the addition of a retail store, drive-thru carwash, and additional fuel dispensers at the current fuel station on site (both semi-truck dispensers, and conventional fuel dispensers)

Table 1-1 provides a summary of the existing and proposed uses. The Project lies within the western portion of the San Joaquin Valley. Figures 1-1 and 1-2 show the location of the Project along with major roadways and highways and study intersections and segments.

1.1.1 *Project Access*

Access to the existing site is provided by three (3) one-way stop controlled driveways along Jersey Avenue and four (4) one-way stop controlled driveways along 17th Avenue. The main access point to the site is provided along Jersey Avenue, approximately 1,300 feet west of 17th Avenue.

1.1.2 *Study Area*

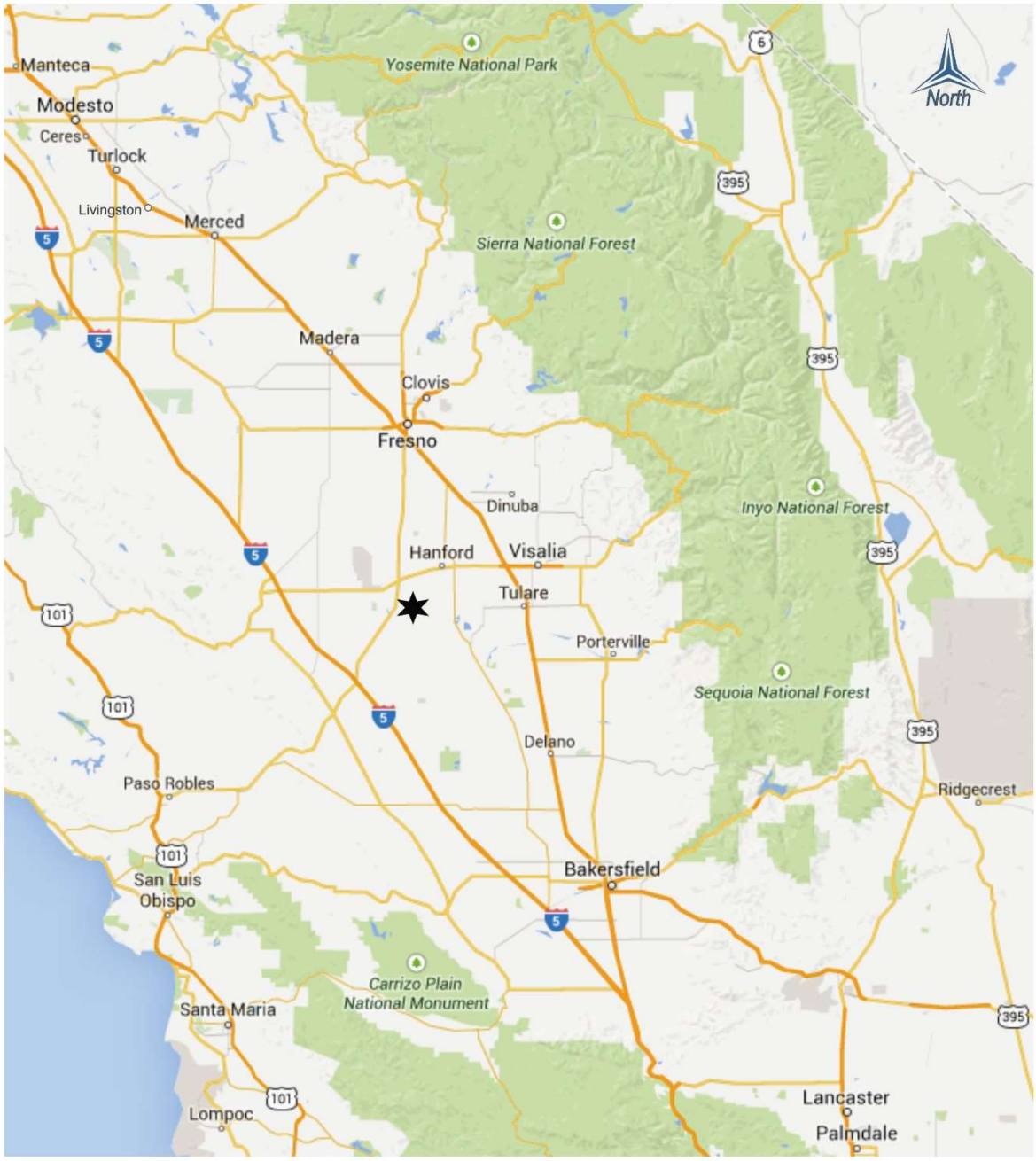
The study intersections and street and highway segments included in this TIS are listed below and shown in Figure 1-2. The study area outlined below was developed in consultation with Kings County staff. A Preliminary Trip Generation Methodology and Trip Distribution Memorandum for the Project was provided to County staff for review and comment. The memorandum is provided in Appendix A.

Table 1-1
Tachi Palace Hotel & Casino Expansion Project

USES	EXISTING	PROPOSED	NET CHANGE
Gaming Space	70,500 sq.ft.	88,500 sq.ft.	18,000 sq. ft.
- Class II and III Gaming Devices	2,108	3,110	1,002
- Table Games	27	27	N/A
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Pool Hall	3,927 sq. ft. / 9 Billard Tables	3,927 sq. ft. / 9 Billard Tables	N/A
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Racing Fuel Pumps	8 Pumps	8 Pumps	N/A
Electric Charging Stations	2 Stations	2 Stations	N/A
Class II Slot Machines	42	102	60
Car Wash Bays	N/A	3	3
Parking	2,000 Stalls	4,000 Stalls	2,000 Stalls

Tachi Palace Hotel & Casino Expansion Project
Regional Location

Figure 1-1

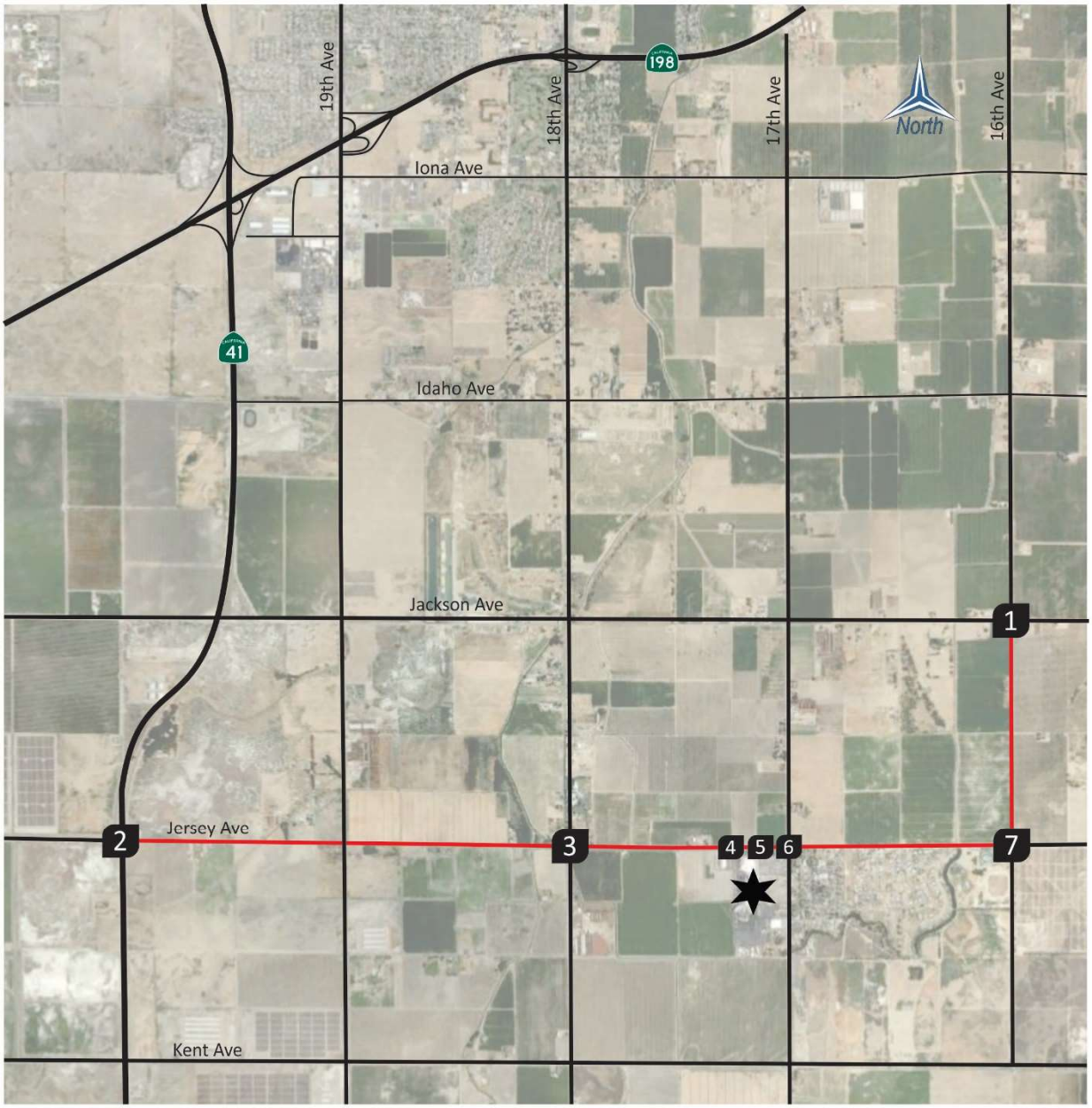


LEGEND

★ Project Location

VRPA TECHNOLOGIES, INC.

Tachi Palace Hotel & Casino Expansion Project **Figure 1-2**
Project Location



Intersections

- ✓ Jackson Avenue at 16th Avenue
- ✓ Jersey Avenue at SR 41 (20th Avenue)
- ✓ Jersey Avenue at 18th Avenue
- ✓ Jersey Avenue at Main Tachi Palace Hotel & Casino Driveway
- ✓ Jersey Avenue at Project Driveway 2
- ✓ Jersey Avenue at 17th Avenue
- ✓ Jersey Avenue at 16th Avenue

Roadway Segments

- ✓ 16th Avenue between:
  - Jackson Avenue and Jersey Avenue

- ✓ Jersey Avenue between:
  - SR 41 and 18th Avenue
  - 18th Avenue and 17th Avenue
  - 17th Avenue and 16th Avenue

1.1.3 *Study Scenarios*

The TIS completed for the Project includes level of service (LOS) analysis for a Friday and Saturday peak hour for the following traffic scenarios.

- ✓ Existing Conditions
- ✓ Existing Plus Project
- ✓ Near-Term Plus Project
- ✓ Cumulative Year 2043 Without Project
- ✓ Cumulative Year 2043 Plus Project

1.2 Methodology

When preparing a TIS, guidelines set by affected agencies are followed. Guidelines incorporated in the Highway Capacity Manual (HCM), 6th Edition, published in 2016 were used in the development of this TIS. LOS methodologies are applied when analyzing street and intersection capacities. LOS standards are applied by transportation agencies to quantitatively assess a street and highway system's performance. In addition, safety concerns are analyzed to determine the need for appropriate mitigation resulting from increased traffic near sensitive uses, the need for dedicated ingress and egress access lanes to the Project, and other evaluations such as the need for signalized intersections or other improvements.

1.2.1 *Intersection Analysis*

Intersection LOS analysis was conducted using the Synchro software program. Synchro supports HCM methodologies and is deemed an acceptable program by Kings County staff for assessment of traffic impacts. Levels of Service can be determined for both signalized and unsignalized intersections. All of the existing study intersections are currently unsignalized.

Tables 1-2 and 1-3 indicate the ranges in the amounts of average delay for a vehicle at signalized and unsignalized intersections for the various levels of service ranging from LOS "A" to "F".

The signalized LOS standards applied to calculate intersection LOS are in accordance with the current edition of the HCM. Intersection turning movement counts and roadway geometrics used to develop LOS calculations were obtained from field review findings and count data provided from the traffic count sources identified in Section 2.1.

When an unsignalized intersection does not meet acceptable LOS standards, the investigation of the need for a traffic signal shall be evaluated. The latest edition of the California Manual on Uniform Traffic Control Devices for Streets and Highways (California MUTCD) introduces standards for determining the need for traffic signals. The California MUTCD indicates that the satisfaction of one or more traffic signal warrants does not in itself require the installation of a traffic signal. In addition to the warrant analysis, an engineering study of the current or expected traffic conditions should be conducted to determine whether the installation of a traffic signal is justified. The California MUTCD Peak Hour Warrant (Warrant 3) was used to determine if a traffic signal is warranted at unsignalized intersections that fall below current LOS standards.

1.2.2 *Roadway Segment Analysis*

According to the HCM, LOS is categorized by two parameters of traffic: uninterrupted and interrupted flow. Uninterrupted flow facilities do not have fixed elements such as traffic signals that cause interruptions in traffic flow. Interrupted flow facilities do have fixed elements that cause an interruption in the flow of traffic, such as stop signs and signalized intersections along arterial roads. A roadway segment is defined as a stretch of roadway generally located between signalized or controlled intersections.

Segment LOS is important in order to understand whether the capacity of a roadway can accommodate future traffic volumes. Table 1-4 provides a definition of segment LOS. The performance criteria used for evaluating volumes and capacities on the road and highway system for this study were estimated using the Highway Capacity Software (HCS) which utilizes HCM 6th Edition methodologies.

Table 1-2
Signalized Intersections
Level of Service Definitions
(Highway Capacity Manual)

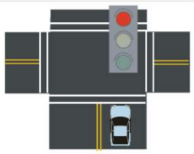
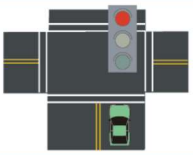
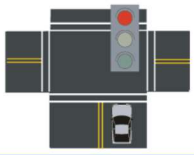
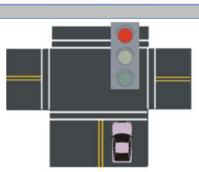
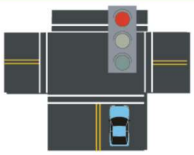
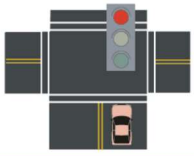
LEVEL OF SERVICE	DEFINITION		AVERAGE TOTAL DELAY (sec/veh)
A	Describes operations with very low delay. This level of service occurs when there is no conflicting traffic for a minor street.		≤ 10.0
B	Describes operations with moderately low delay. This level generally occurs with a small amount of conflicting traffic causing higher levels of average delay.		> 10.0 - 20.0
C	Describes operations with average delays. These higher delays may result from a moderate amount of minor street traffic. Queues begin to get longer.		> 20.0 - 35.0
D	Describes a crowded operation, with below average delays. At level D, the influence of congestion becomes more noticeable. Longer delays may result from shorter gaps on the mainline and an increase of minor street traffic. The queues of vehicles are increasing.		> 35.0 - 55.0
E	Describes operations at or near capacity. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor gaps for the minor street to cross and large queues.		> 55.0 - 80.0
F	Describes operations that are at the failure point. This level, considered to be unacceptable to most drivers, often occurs with over- saturation, that is, when arrival flow rates exceed the capacity of the intersection. Insufficient gaps of suitable size exist to allow minor traffic to cross the intersection safely.		> 80.0

Table 1-3
Unsignalized Intersections
Level of Service Definitions
(Highway Capacity Manual)

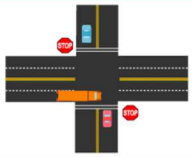
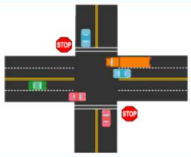
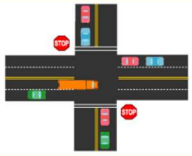
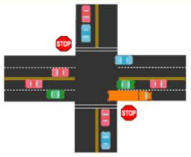
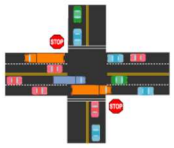
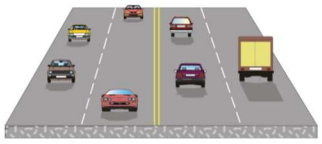
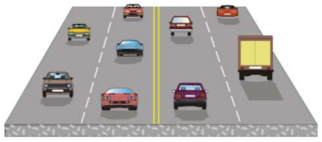
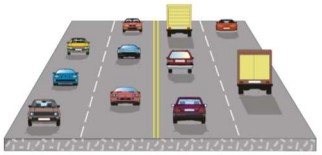
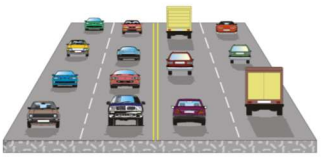
LEVEL OF SERVICE	DEFINITION	AVERAGE TOTAL DELAY (sec/veh)
A	No delay for stop-controlled approaches. 	0 - 10.0
B	Describes operations with minor delay. 	> 10.0 - 15.0
C	Describes operations with moderate delays. 	> 15.0 - 25.0
D	Describes operations with some delays. 	> 25.0 - 35.0
E	Describes operations with high delays and long queues. 	> 35.0 - 50.0
F	Describes operations with extreme congestion, with very high delays and long queues unacceptable to most drivers. 	> 50.0

Table 1-4
Roadway Segment
Level of Service Definitions
(Highway Capacity Manual)

LEVEL OF SERVICE	DEFINITION	
A	Represents free flow. Individual vehicles are virtually unaffected by the presence of others in the traffic stream.	
B	Is in the range of stable flow, but the presence of other vehicles in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.	
C	Is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual vehicles becomes significantly affected by interactions with other vehicles in the traffic stream.	
D	Is a crowded segment of roadway with a large number of vehicles restricting mobility and a stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.	
E	Represents operating conditions at or near the level capacity. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.	
F	Is used to define forced or breakdown flow (stop-and-go gridlock). This condition exists when the amount of traffic approaches a point where the amount of traffic exceeds the amount that can travel to a destination. Operations within the queues are characterized by stop and go waves, and they are extremely unstable.	

1.3 Policies to Maintain Level of Service

An important goal is to maintain acceptable levels of service along the highway, street, and road network. To accomplish this, affected agencies adopt minimum levels of service in an attempt to control congestion that may result as new development occurs. As noted previously, LOS standards are applied by transportation agencies to quantitatively assess a street and highway system's performance. The affected level of service standards applicable to the traffic analysis are described below.

Kings County

The Circulation Element of the Kings County General Plan guides the continued development and improvement of the circulation system to support existing and planned development. The Circulation Element addresses the circulation improvements needed to provide adequate capacity for future land uses. The Element establishes a hierarchy of transportation routes with typical development standards described for each roadway category. The County also includes additional standards, plans and programs that apply to the evaluation of transportation impacts of the Project. These standards cover the primary aspects of the transportation system.

Kings County's 2035 General Plan identifies a minimum LOS standard of E for urban areas and D for rural areas.

Caltrans

Based on the 2002 Caltrans Guide for the Preparation of Traffic Impact Studies, the LOS for operating State highway facilities is based on Measures of Effectiveness (MOE) identified in the Highway Capacity Manual (HCM). Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities; however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than this target LOS, the existing MOE should be maintained. In general, the region-wide goal for an acceptable LOS on all freeways, roadways segments, and intersections is "D". For undeveloped or not densely developed locations, the goal may be to achieve LOS "C".

2.0 Existing Conditions

2.1 Existing Traffic Counts and Roadway Geometrics

The first step toward assessing Project traffic impacts is to assess existing traffic conditions. Existing Friday and Saturday PM peak hour turning movements were collected at key study intersection by National Data and Surveying Services. Intersection turning movement counts were conducted for the peak periods of 5:00-7:00pm for all key intersections on Friday, February 21, 2020 and Saturday, February 22, 2020. Traffic count data worksheets are provided in Appendix B. The traffic counts were conducted during fair weather conditions, while schools in the area were in session. The traffic counts represent typical volumes experienced in the study area.

2.2 Existing Roadway Classification System

Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the type of service they are intended to provide. Fundamental to this process is the recognition that individual streets and highways do not serve travel independently in any major way. Rather, most travel involves movement through a network of roads.

The current hierarchical system of roadways consists of the following four (4) basic classifications:

- ✓ ***State Routes*** – are roadway facilities maintained by Caltrans. Caltrans manages more than 50,000 miles of California's highway and freeway systems.
- ✓ ***Arterials*** – Four- to six-lane divided roadways, with somewhat limited access to abutting properties, and with the primary purpose of moving traffic within and between community plan areas and to and from freeways.
- ✓ **Collectors** – Two to four-lane undivided roadways, with the primary function of connecting local streets and arterials and neighborhood traffic generators and providing access to abutting properties.
- ✓ **Local Streets** – Two- to three-lane public or private roadways designed to provide direct access to properties while discouraging through traffic between major streets. They are intended to carry low volumes of traffic and support unrestricted on-street parking.

2.3 Affected Intersections and Roadways

Intersections and roadway segments near and adjacent to the Project site were analyzed to determine levels of service utilizing HCM-based methodologies described previously. The study intersections and roadway segments included in this TIS are listed below. The study area outlined below was developed in consultation with Kings County staff. VRPA prepared a scoping document

that included the proposed methodology for the traffic analysis as well as the study area.

Intersections

- ✓ Jackson Avenue at 16th Avenue
- ✓ Jersey Avenue at SR 41 (20th Avenue)
- ✓ Jersey Avenue at 18th Avenue
- ✓ Jersey Avenue at Main Tachi Palace Hotel & Casino Driveway
- ✓ Jersey Avenue at Project Driveway 2
- ✓ Jersey Avenue at 17th Avenue
- ✓ Jersey Avenue at 16th Avenue

Roadway Segments

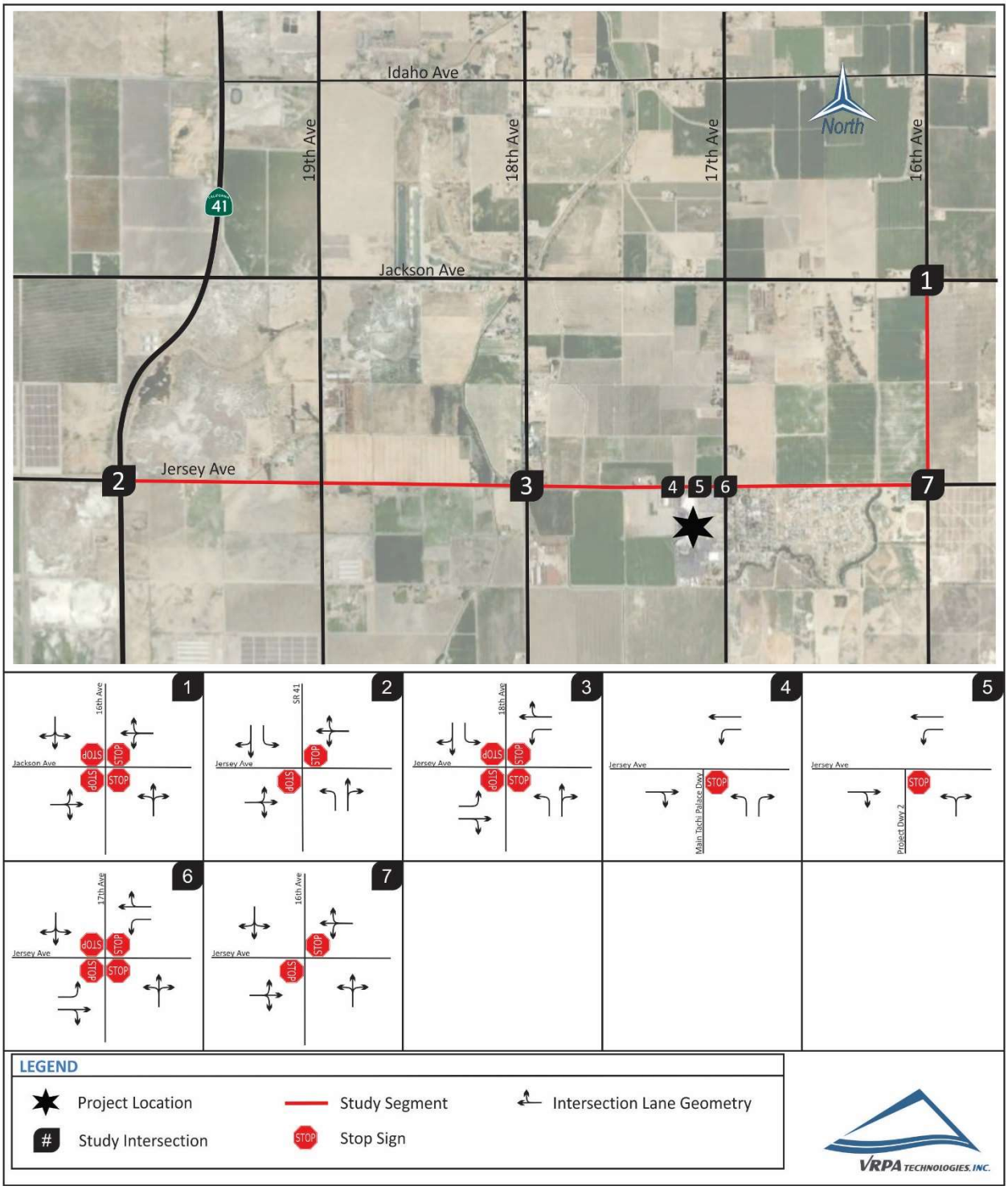
- ✓ 16th Avenue between:
  - Jackson Avenue and Jersey Avenue

- ✓ Jersey Avenue between:
  - SR 41 and 18th Avenue
  - 18th Avenue and 17th Avenue
  - 17th Avenue and 16th Avenue

Existing lane geometry at study intersections and roadway segments is shown in Figure 2-1. All of the existing study intersections are currently unsignalized. Existing Friday and Saturday PM peak hour traffic volumes are shown in Figures 2-2 and 2-3.

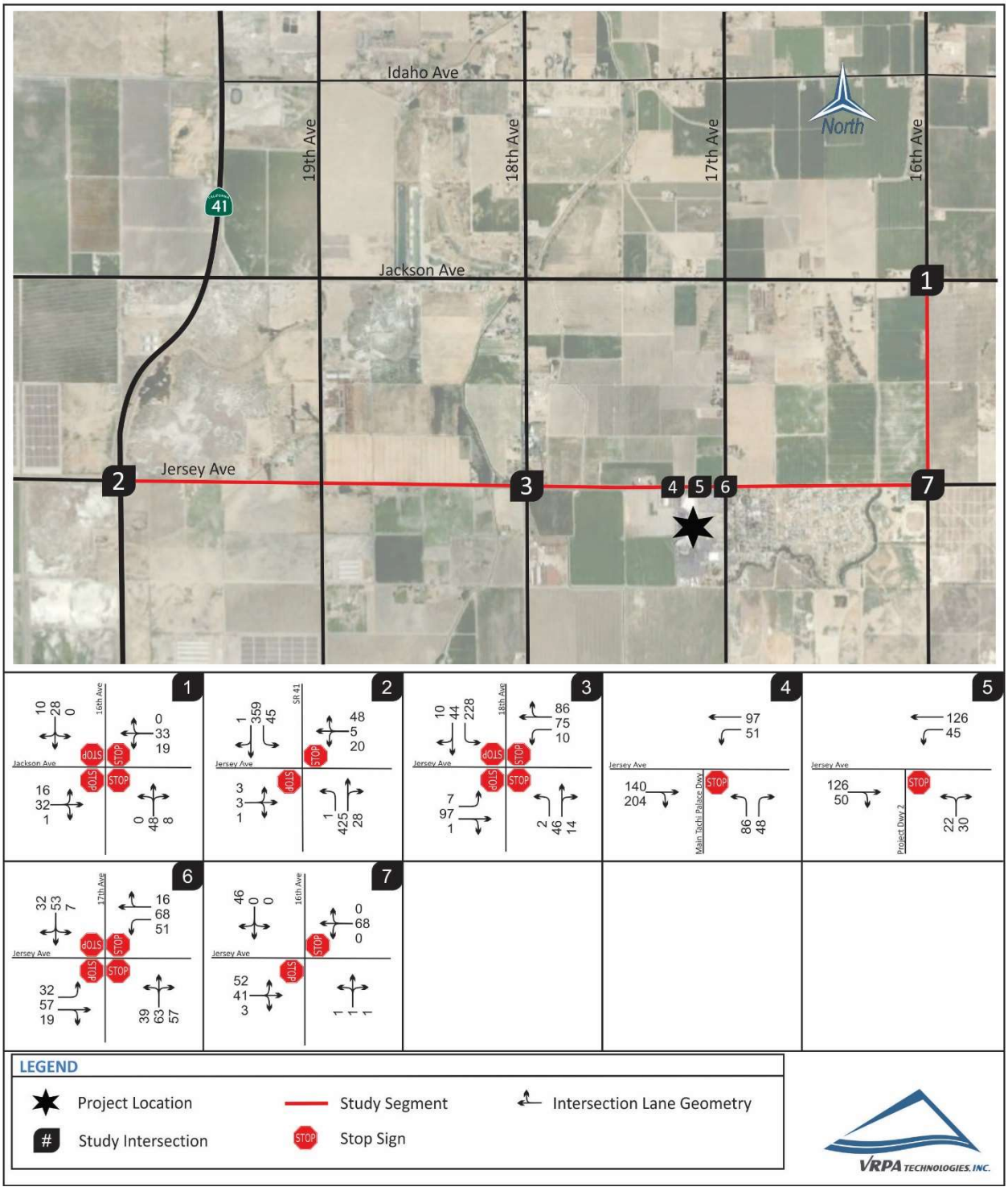
Tachi Palace Hotel & Casino Expansion Project
Existing Lane Geometry

Figure 2-1



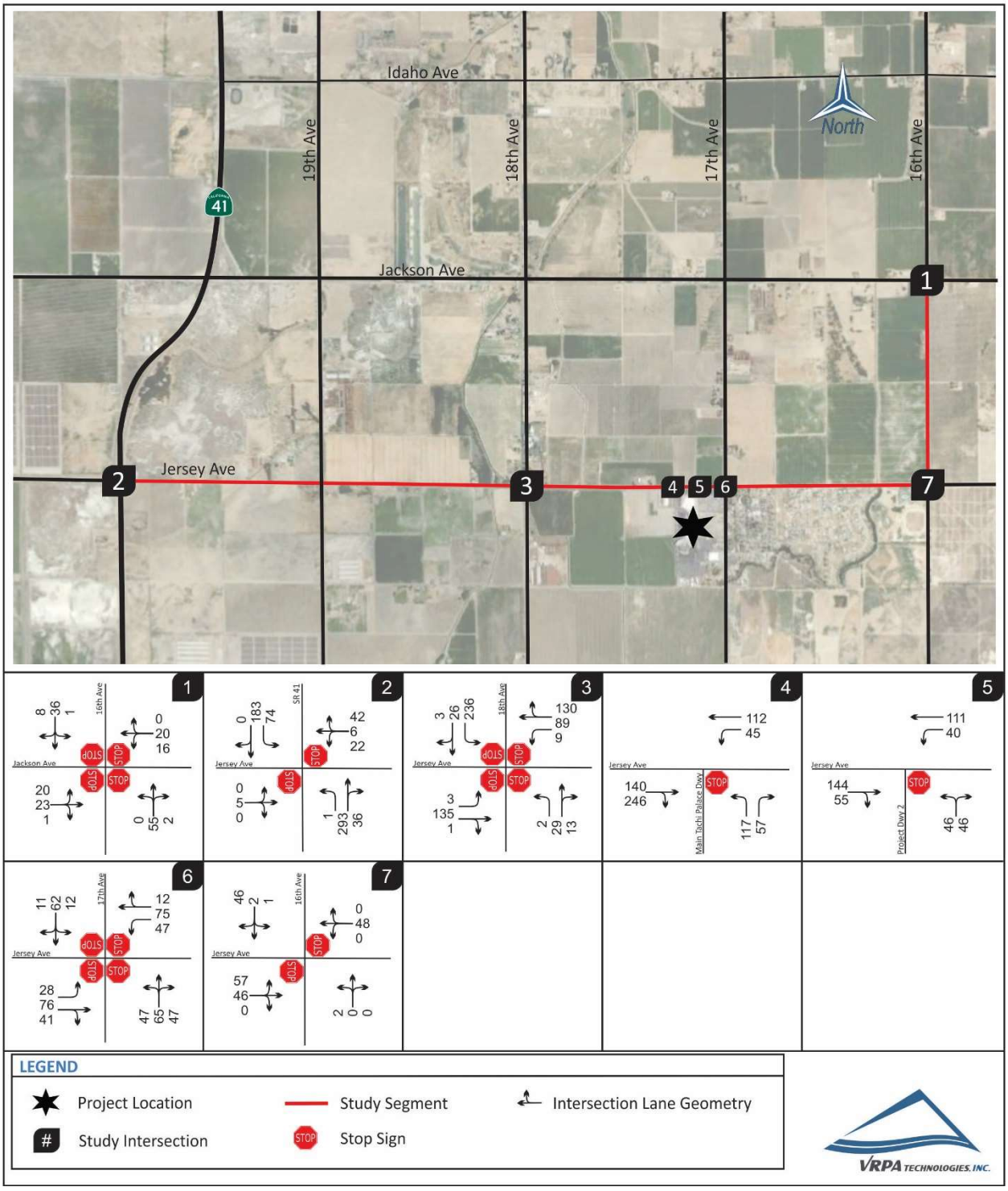
Tachi Palace Hotel & Casino Expansion Project
Existing Friday PM Peak Hour Traffic

Figure 2-2



Tachi Palace Hotel & Casino Expansion Project
Existing Saturday PM Peak Hour Traffic

Figure 2-3



2.4 Level of Service

2.4.1 *Intersection Capacity Analysis*

All intersection LOS analyses were estimated using Synchro Software. Various roadway geometrics, traffic volumes, and properties (peak hour factors, storage pocket length, etc) were input into the Synchro Software program in order to accurately determine the travel delay and LOS for each Study scenario. The intersection LOS and delays reported represent the HCM 6th Edition outputs. Synchro assumptions, listed below, show the various Synchro inputs and methodologies used in the analysis.

✓ **Lane Geometry**
- Storage lengths for turn lanes for existing intersections were obtained from aerial photos and rounded to the nearest 25 feet.

✓ **Traffic Conditions**
- Peak hour factors (PHF) for each intersection approach were obtained from existing traffic counts and utilized for Existing Conditions, Existing Plus Project, and Near-term Conditions. For all future scenarios, a PHF of 0.92 was applied unless the existing PHF is greater than 0.92. The PHF measures the relationship between the peak 15-minute interval of traffic compared to the total vehicle volume over the entire Peak Hour. It represents the traffic demand fluctuations during the Peak Hour. A PHF that is equal to 1 demonstrates that the traffic volume in every 15-minute interval is the same and therefore the traffic flow is constant throughout the hour.
- Roadway link speed limits were observed in the field and input into the Synchro network to determine roadway link speeds.
- Heavy vehicle percentages were applied in accordance with the HCM default (3%).

Results of the analysis show that all of the study intersections are currently operating at acceptable levels of service during the Friday and Saturday PM peak hours. Table 2-1 shows the intersection LOS for the existing conditions scenario. Synchro Worksheets are provided in Appendix C.

2.4.2 *Queuing*

Table 2-2 provides a queue length summary for study intersections for the Existing scenario. Traffic queue lengths at an intersection or along a roadway segment assist in the determination of a roadway's overall performance. Excessive queuing at an intersection increases vehicle delay and reduces capacity. If a dedicated left turn lane doesn't provide adequate storage, vehicles will queue beyond the left turn storage pocket and into other travel lanes, thus increasing vehicle delay and reducing capacity. The queuing analyses is based upon methodology presented in Chapter 400 of Caltrans' Highway Design Manual (HDM), which is included in Appendix D. The queue results shown in Table 2-2 represent the approximate queue lengths for the respective

lane movements.

2.4.3 *Roadway Segment Capacity Analysis*

Results of the segment analysis along the existing street and highway system are reflected in Table 2-3. The performance criteria used for evaluating volumes and capacities on the road and highway system for this study are discussed in Section 1.2.2. Results of the analysis show that all of the roadway segments are currently operating at acceptable levels of service. HCS Worksheets are provided in Appendix E.

Table 2-1
Existing Intersection Operations

INTERSECTION	CONTROL	TARGET LOS	PEAK HOUR	EXISTING	
				DELAY	LOS
1. Jackson Avenue / 16th Avenue	Four-Way Stop Sign	D	FRIDAY PM	7.6	A
			SATURDAY PM	7.7	A
2. Jersey Avenue / SR 41	Two-Way Stop Sign	C	FRIDAY PM	23.9	C
			SATURDAY PM	16.8	C
3. Jersey Avenue / 18th Avenue	Four-Way Stop Sign	D	FRIDAY PM	11.3	B
			SATURDAY PM	11.9	B
4. Jersey Avenue / Main Tachi Palace Driveway	One-Way Stop Sign	D	FRIDAY PM	13.2	B
			SATURDAY PM	13.1	B
5. Jersey Avenue / Project Driveway 2	One-Way Stop Sign	D	FRIDAY PM	10.5	B
			SATURDAY PM	10.8	B
6. Jersey Avenue / 17th Avenue	Four-Way Stop Sign	D	FRIDAY PM	9.2	A
			SATURDAY PM	9.2	A
7. Jersey Avenue / 16th Avenue	Two-Way Stop Sign	D	FRIDAY PM	10.1	B
			SATURDAY PM	7.4	A

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For four-way stop intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

Table 2-2
Existing Queuing Operations

INTERSECTION	EXISTING QUEUE STORAGE LENGTH (ft)		EXISTING CONDITIONS	
			Friday PM Queue	Saturday PM Queue
Jersey Avenue / SR 41	NB Left	425	1	1
	SB Left	425	38	62
Jersey Avenue / 18th Avenue	NB Left	100	2	2
	SB Left	100	**190**	**197**
	EB Left	200	6	3
	WB Left	100	8	8
Jersey Avenue / Main Tachi Palace Driveway	NB Right	75	40	48
	WB Left	100	43	38
Jersey Avenue / Project Driveway 2	WB Left	100	38	33
Jersey Avenue / 17th Avenue	EB Left	100	27	23
	WB Left	100	43	39

Queue is measured in feet / **BOLD** denotes exceedance

Table 2-3
Existing Segment Operations

STREET SEGMENT	SEGMENT DESCRIPTION	TARGET LOS	PEAK HOUR	DIRECTION	EXISTING	
					VOLUME	LOS
16th Avenue						
Jackson Avenue to Jersey Avenue	2 Lanes Undivided	D	Friday PM	NB	56	A
				SB	48	A
			Saturday PM	NB	57	A
				SB	53	A
Jersey Avenue						
SR 41 to 18th Avenue	2 Lanes Undivided	D	Friday PM	EB	105	A
				WB	87	A
			Saturday PM	EB	139	A
				WB	94	A
18th Avenue to 17th Avenue	2 Lanes Undivided	D	Friday PM	EB	339	B
				WB	171	A
			Saturday PM	EB	384	B
				WB	228	A
17th Avenue to 16th Avenue	2 Lanes Undivided	D	Friday PM	EB	121	A
				WB	135	A
			Saturday PM	EB	135	A
				WB	134	A

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

3.0 Traffic Impacts

This chapter provides an assessment of the traffic the Project is expected to generate and the impact of that traffic on the surrounding street system.

3.1 Trip Generation

To assess the impacts that the Project may have on the surrounding street and highway segments and intersections, the first step is to determine Project trip generation. Project trip generation is typically determined by use of trip generation rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition). The land use designation from the ITE Trip Generation Manual that best describes the proposed Project is the Casino/Video Lottery Establishment (Land Use 473). However, the description of that land use isn't comparable to the existing Tachi Palace Hotel & Casino or proposed Project. ITE Land Use 473 describes casino establishments where full food service isn't generally provided and establishments that don't include hotel facilities. In addition, the data sources for Land Use 473 come from casino establishments located in the Midwest and on the East Coast. It should also be noted that the square footage of the data sources included in the ITE Trip Generation Manual are between 590 and 2,390 square feet. In contrast, the Project proposes to develop approximately 88,500 square feet of gaming space in addition to other uses as noted in Section 1.0.

3.1.1 *Casino / Hotel Trips*

As noted previously, the Project includes level of service (LOS) analysis for a Friday and Saturday peak hour which was determined by existing counts at the existing Project Driveways. Appropriate peak hour counts (Friday/Saturday) at the existing Tachi Palace Hotel & Casino were used to assist in determining the trip generation for the Project. As noted above the ITE Trip Generation Manual includes a Casino/Video Lottery Establishment land use. However, the description of that land use isn't comparable to the existing Tachi Palace Hotel & Casino or the Project. Standard rates for Indian gaming casinos are not available in the latest edition of the ITE Trip General Manual.

Casino trip generation rates commonly include patrons to the slot machines and table games, as well as ancillary uses such as restaurants, meeting spaces, back-of-house, employees arriving and departing on a shift change, and all of the general activities occurring at the facility during the peak hours. As such, separate calculations for the non-casino functions are typically not necessary. This is particularly true for hotel-casino-event facilities in rural locations, where patrons engage in relatively few "in-and-out" trips after arriving at the facility (as compared to standard hotels for which stand-alone trip generation rates are used).

The existing Tachi-Palace Casino includes an attached hotel with 255 rooms, event space, and meeting space. As a result, peak hour counts at the existing driveways captured employees and patrons of the casino, hotel, on-site restaurants, bars, and other ancillary facilities. These counts

were used to estimate the trip generation for the expansion of the casino, meeting space, additional 200 hotel rooms, and other ancillary facilities.

3.1.2 *Yokut Gas Station*

Improvements to the existing gas station located at the southwest corner of Jersey Avenue and 17th Avenue include the addition of a retail store, drive-thru carwash, and additional fuel dispensers at the current fuel station on site (both semi-truck dispensers, and conventional fuel dispensers). Trip Generation rates for the Friday and Saturday PM peak hour are based on counts conducted at the driveways for the existing casino site. Traffic counts collected at the driveways included trips associated with the existing gas station and convenience store. Therefore, trips attributed to the additional fueling pumps (24) are captured in the trip rate associated with the expansion at the gas station. The Daily Trip Rate is based on the PM Rate to Daily Rate ratio of ITE Land Uses 944, 945, and 960. Trips associated with the Carwash bays were derived from ITE Land Use 949.

3.1.3 *Special Event Venue*

The existing Tachi Palace Hotel & Casino includes a 1,100-seat event/entertainment center. The Project proposes to include a new event/entertainment center space with a seating capacity of 2,500. A separate specific trip generation for the new event center will developed and added to the estimated trip generation for the proposed casino if existing counts at the driveway are not conducted during an event at the Project site. It is anticipated that the presence of the casino/hotel will generate different arrival and departure characteristics than a stand-alone special event venue. It is recommended that the following scenario be analyzed to represent special event traffic:

- ✓ Special Event Venue weekday evening event at full capacity
- ✓ Typical weekday evening activity for all other uses

In order to analyze this scenario, the following assumptions were made:

- ✓ It is considered important to analyze inbound traffic conditions prior to the special event and outbound traffic conditions after the event
- ✓ Information from the 2009 National Household Travel Survey Average Vehicle Occupancy Rate for Social and Recreational Purposes will be used to estimate trips associated with the special event venue. This survey showed a total combined vehicle occupancy of 2.21 persons per vehicle for recreational purposes, which is equivalent to a daily trip generation rate of 0.45 trips per seat.

- ✓ It is conservatively assumed that 50% of special event attendees will be captured by the casino. Data provided in a traffic study for a similar project in a rural county area in northern California shows that just 30% of special event attendees are 'new' patrons[1].
- ✓ Trip generation for the remainder of the Project will be assumed to be the same as the typical weekday peak hour as determined by the traffic counts conducted at the existing facility.
- ✓ Although hours could vary, for traffic analysis purposes it was assumed that the inbound peak hour would occur from 6PM to 7PM and the outbound peak hour would occur from 8 PM to 9 PM. While typical events would be expected to last more than an hour, the time period for the outbound peak hour is considered to be a conservative assumption since prevailing traffic on local roadways would tend to decrease at later hours in the evening.
- ✓ Trips associated with the existing special event venue (1,100 seats) were manually added to existing traffic counts to accurately depict current operations at the existing facility. Special event venue trips from the existing facility were determined by the assumptions noted above.
- ✓ Trips associated with the New Event space was included in the trip generation for the proposed expansion Project.

The Project's estimated Daily, Friday PM peak hour, and Saturday PM peak hour trips are shown in Table 3-1. Table 3-2 includes the estimated Daily and Friday PM peak hour trips associated with the special event venue.

3.2 Trip Distribution

Project trip distribution is shown in Figure 3-1 and is based upon prevailing traffic patterns in the study area, complementary land uses, major routes, population centers, a review of data available in the Kings County Association of Governments (KCAG) travel demand model, and engineering judgment. Project trip distribution as shown in Figure 3-1 also considers the results of the Friday and Saturday PM peak hours trips conducted at driveways of the existing Tachi Palace Hotel & Casino site.

Access to the existing site is provided by three (3) one-way stop controlled driveways along Jersey Avenue and four (4) one-way stop controlled driveways along 17th Avenue. The main access point to the site is provided along Jersey Avenue, approximately 1,300 feet west of 17th Avenue.

1 Kimley Horn, 2016. Traffic Impact Study for the Cache Creek Hotel Expansion Project. Dated July 2016. Available at http://www.cachecreekteir.com/wp-content/uploads/2016/09/Cache-Creek-Hotel-Expansion-TEIR-Vol-2.pdf.

Table 3-1

Project Trip Generation

LAND USE	Quantity	DAILY TRIP ENDS (ADT)		FRIDAY PM PEAK HOUR					SATURDAY TRIP ENDS (ADT)		SATURDAY PM PEAK HOUR				
		RATE	VOLUME	RATE	IN:OUT SPLIT	VOLUME			RATE	VOLUME	RATE	IN:OUT SPLIT	VOLUME		
						IN	OUT	TOTAL					IN	OUT	TOTAL
Hotel and Casino [1]	737.833 k.s.f	14.50	10,700	1.45	63:37	674	396	1,070	18.20	13,430	1.82	60:40	806	537	1,343
Yokut Gas [2]	14.000 k.s.f	238.00	3,332	19.57	51:49	139	135	274	258.86	3,624	19.57	51:49	139	135	274
SUBTOTAL TRIP GENERATION			**14,032**			**813**	**531**	**1,344**		**17,054**			**945**	**672**	**1,617**
Existing Tachi Palace Hotel & Casino															
EXISTING TACHI PALACE HOTEL & CASINO [3]			7,900		63:37	500	290	790		9,910		60:40	593	398	991
YOKUT GAS [4]			1,145		51:49	47	46	93		1,246		51:49	47	46	93
EXISTING SITE TOTAL TRIP GENERATION			**9,045**			**547**	**336**	**883**		**11,156**			**640**	**444**	**1084**
NET TOTAL TRIP GENERATION			**4,987**			**266**	**195**	**461**		**5,898**			**305**	**228**	**533**

Source: Generation factors from ITE Trip Generation Manual, 10th Edition.

Trip ends are one-way traffic movements, entering or leaving.

The numbers in parenthesis are ITE land use codes.

1 - Trip Generation Rates for the Friday and Saturday PM peak hour are based on counts conducted at the driveways for the existing Casino site. Traffic counts collected at the driveways included trips associated with the existing gaming space, bingo hall/entertainment, restaurants, and hotel in the Casino. Therefore, trips attributed to the additional gaming space, bingo hall/entertainment space, and hotel expansion are captured in the trip rate associated with the increase in Hotel and Casino square footage. The Daily Trip Rate assumes that 10% of daily traffic occurs during the PM peak hour.

2 - Trip Generation Rates for the Friday and Saturday PM peak hour are based on counts conducted at the driveways for the existing Casino site. Traffic counts collected at the driveways included trips associated with the existing gas station and convenience store. Therefore, trips attributed to the additional fueling pumps (24) are captured in the trip rate associated with the expansion at the gas station. The Daily Trip Rate is based on the PM Rate to Daily Rate ratio of ITE Land Uses 944, 945, and 960. Trips associated with the Carwash bays were derived from ITE Land Use 949.

3 - The Daily Trip Rate assumes that 10% of daily traffic ocurs during the PM peak hour. Friday PM and Saturday PM peak hour trips determined from existring counts.

4 - The Daily Trip Rate is based on the PM Rate to Daily Rate ratio of ITE Land Uses 944, 945, and 960. Friday PM and Saturday PM peak hour trips determined from existring counts.

Table 3-2

Project Trip Generation with Special Event

LAND USE	Quantity	DAILY TRIP ENDS (ADT)		FRIDAY PM PEAK HOUR - INBOUND					FRIDAY PM PEAK HOUR - OUTBOUND				
		RATE	VOLUME	RATE	IN:OUT SPLIT	VOLUME IN	VOLUME OUT	VOLUME TOTAL	RATE	IN:OUT SPLIT	VOLUME IN	VOLUME OUT	VOLUME TOTAL
Hotel and Casino [1]	676.415 k.s.f	14.50	9,810	1.45	63:37	618	363	981	1.45	63:37	618	363	981
Yokut Gas [2]	14.000 k.s.f	238.00	3,332	19.57	51:49	139	135	274	19.57	51:49	139	135	274
Special Event [3]	3,600 seats	0.45	1,620	0.23	95:5	787	41	828	0.23	5:95	41	787	828
SUBTOTAL TRIP GENERATION			**14,762**			**1544**	**539**	**2,083**			**798**	**1285**	**2,083**
Existing Tachi Palace Hotel & Casino													
EXISTING TACHI PALACE HOTEL & CASINO [4]			7,900		63:37	500	290	790		63:37	500	290	790
YOKUT GAS [5]			1,145		51:49	47	46	93		51:49	47	46	93
EXISTING TACHI PALACE HOTEL & CASINO SPECIAL EVENT TRAFFIC [3]	1,100 seats	0.45	495	0.23	95:5	240	13	253	0.23	5:95	13	240	253
EXISTING SITE TOTAL TRIP GENERATION			**9,540**			**787**	**349**	**1136**			**560**	**576**	**1136**
NET TOTAL TRIP GENERATION			**5,222**			**757**	**190**	**947**			**238**	**709**	**947**

Source: Generation factors from ITE Trip Generation Manual, 10th Edition.
Trip ends are one-way traffic movements, entering or leaving.
The numbers in parenthesis are ITE land use codes.

1 - Trip Generation Rates for the Friday PM peak hour are based on counts conducted at the driveways for the existing Casino site. Traffic counts collected at the driveways included trips associated with the existing gaming space, bingo hall/entertainment, restaurants, and hotel in the Casino. Therefore, trips attributed to the additional gaming space, bingo hall/entertainment space, and hotel expansion are captured in the trip rate associated with the increase in Hotel and Casino square footage. The Daily Trip Rate assumes that 10% of daily traffic occurs during the PM peak hour.

2 - Trip Generation Rates for the Friday PM peak hour are based on counts conducted at the driveways for the existing Casino site. Traffic counts collected at the driveways included trips associated with the existing gas station and convenience store. Therefore, trips attributed to the additional fueling pumps (24) are captured in the trip rate associated with the expansion at the gas station. The Daily Trip Rate is based on the PM Rate to Daily Rate ratio of ITE Land Uses 944, 945, and 960. Trips associated with the Carwash bays were derived from ITE Land Use 949.

3 - Information from the 2009 National Household Travel Survey Average Vehicle Occupancy Rate for Social and Recreational Purposes will be used to estimate trips associated with the special event venue. This survey showed a total combined vehicle occupancy of 2.21 persons per vehicle for recreational purposes, which is equivalent to a daily trip generation rate of 0.9 trips per seat.

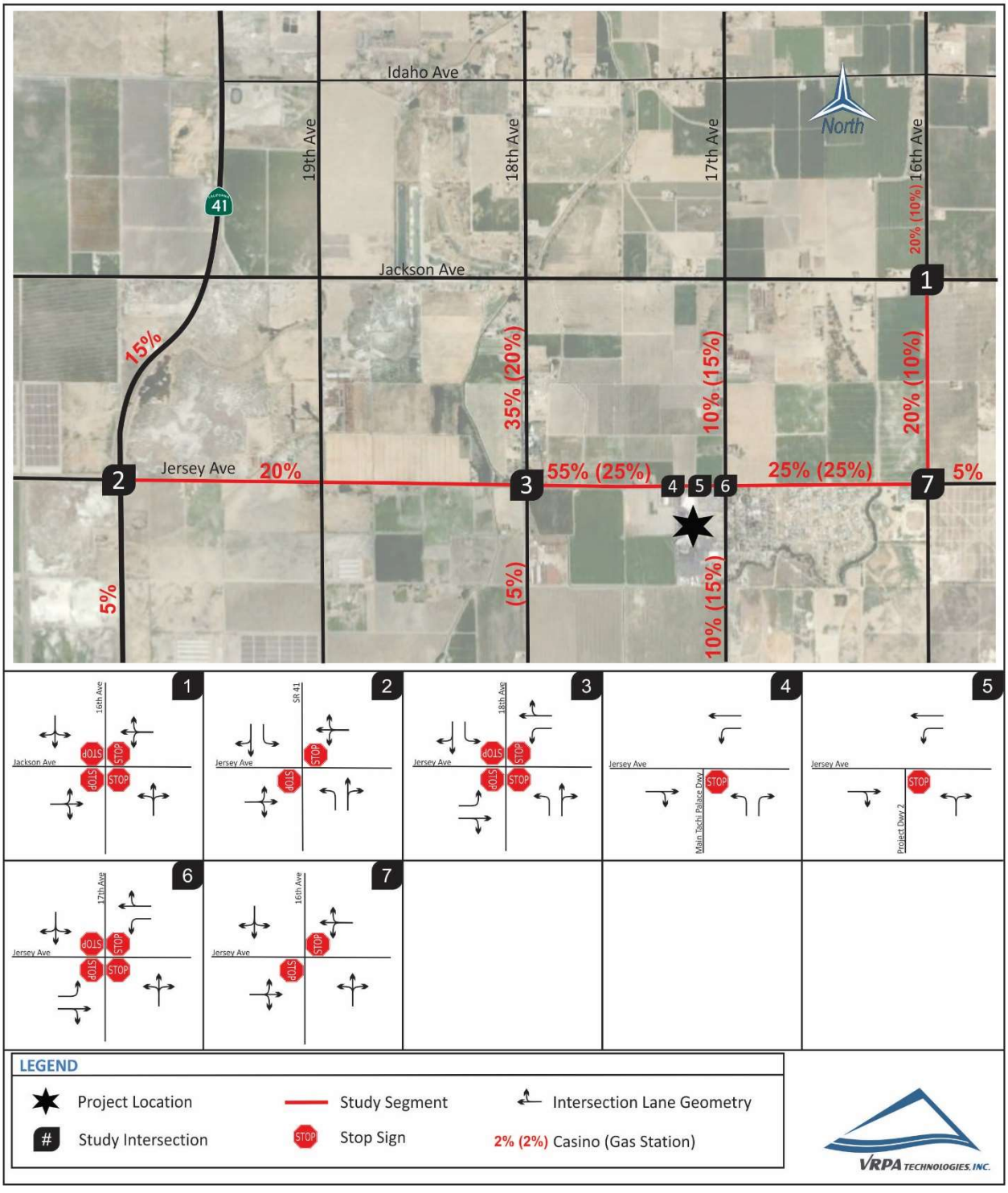
It is conservatively assumed that 50% of special event attendees will be captured by the casino. Data provided in a traffic study for a similar project in a rural county area in northern California shows that just 30% of special event attendees are 'new' patrons.

4 - The Daily Trip Rate assumes that 10% of daily traffic ocurs during the PM peak hour. Friday PM and Saturday PM peak hour trips determined from existring counts.

5 - The Daily Trip Rate is based on the PM Rate to Daily Rate ratio of ITE Land Uses 944, 945, and 960. Friday PM and Saturday PM peak hour trips determined from existring counts.

Tachi Palace Hotel & Casino Expansion Project
Project Trip Distribution

Figure 3-1



3.3 Project Traffic

Project traffic as shown in Tables 3-1 and 3-2 was distributed to the roadway system using the trip distribution percentages shown in Figure 3-1. A graphical representation of the resulting Friday and Saturday PM peak hour Project trips used is shown in Figures 3-2, 3-3, 3-4, and 3-5.

3.4 Existing Plus Project Traffic Conditions

An Existing Plus Project Scenario was analyzed to include existing traffic plus traffic generated by the Project. The resulting traffic is shown in Figures 3-6, 3-7, 3-8, and 3-9.

3.5 Near-Term Traffic Conditions

Traffic conditions with the Project in the Year 2023 were estimated by applying a growth rate of 2.10% per year to the existing traffic volumes in accordance with KCAG travel model projections. Project traffic as shown in Figures 3-2 and 3-3 were used to estimate traffic conditions in the year 2023.

Approved/Pending Project Traffic

Traffic impact analyses typically require the analysis of approved or pending developments that have not yet been built in the vicinity of the Project site in addition to the proposed Project. Kings County staff determined that no applicable approved/pending projects exist within the Project study area.

The resulting traffic for the Near-Term Plus Project scenario is shown in Figures 3-10 and 3-11.

3.6 Cumulative Year 2043 Without Project Traffic Conditions

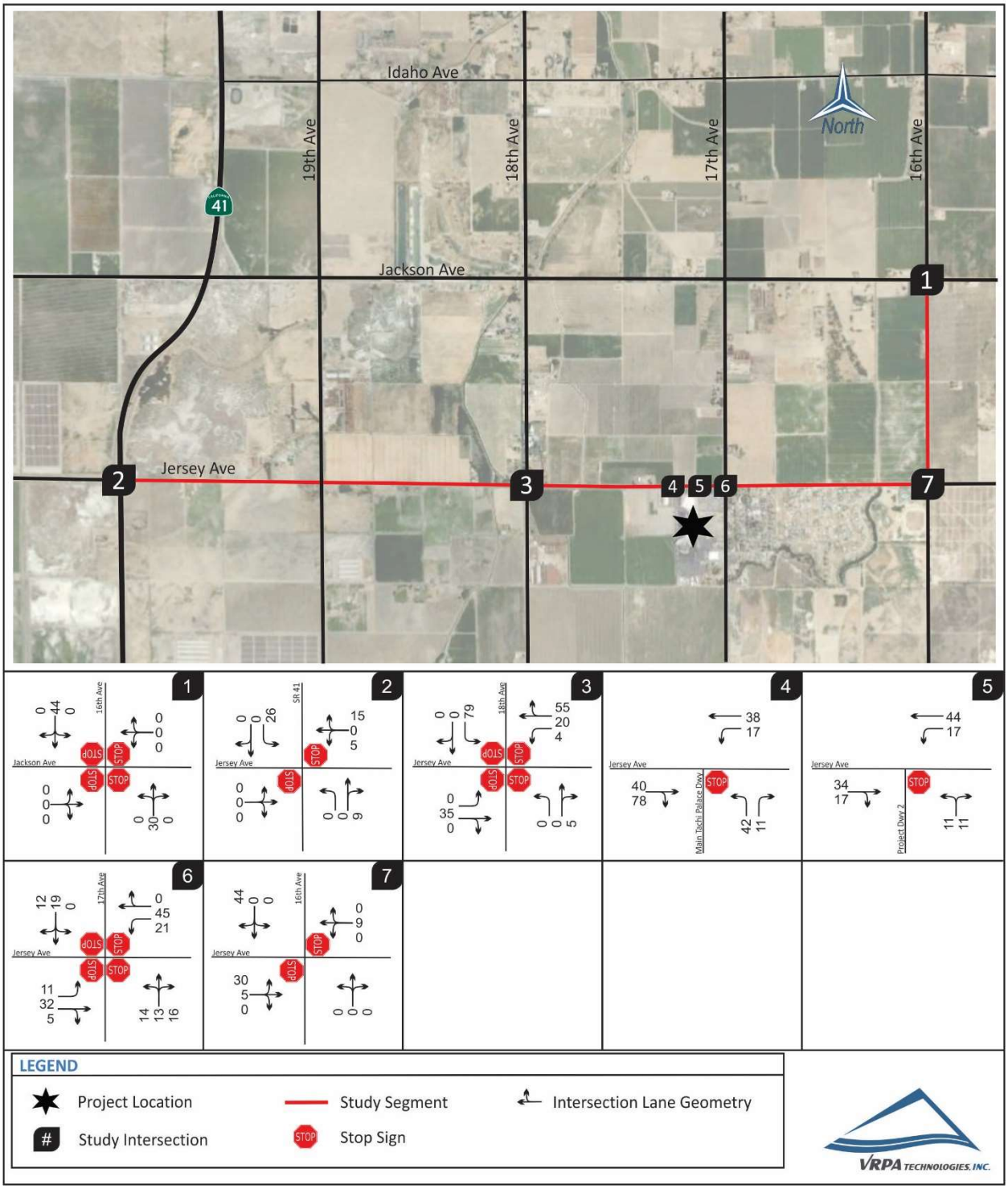
The impacts of the Project were analyzed considering future traffic conditions in the year 2043. The levels of traffic expected in 2043 relate to the cumulative effect of traffic increases resulting from the implementation of the General Plans of local agencies, including Kings County and the City of Lemoore. Traffic conditions with and without the Project in the Year 2043 were estimated by applying a growth rate of 2.10% per year to the existing traffic volumes. A comparison of the KCAG base year and future year travel model showed that the growth in the study area is approximately 2.10% per year. The resulting traffic is shown in Figures 3-12 and 3-13.

3.7 Cumulative Year 2043 Plus Project Traffic Conditions

The addition of Project trips, as shown in Figures 3-2, 3-3, 3-4, and 3-5 (Section 3.3), were added to Cumulative Year 2043 Without Project traffic volumes. This leads to the results shown in Figures 3-14, 3-15, 3-16, and 3-17.

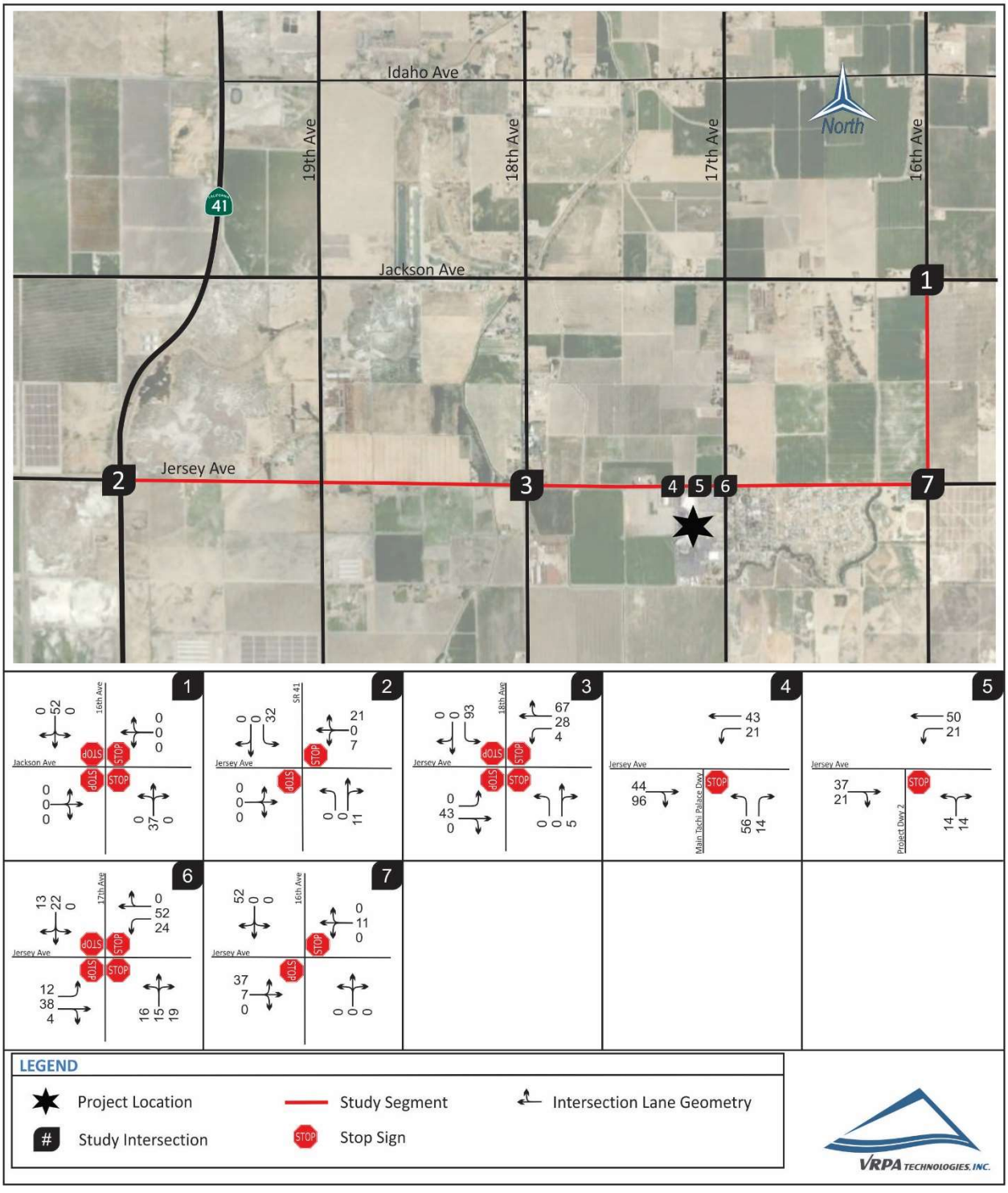
Tachi Palace Hotel & Casino Expansion Project
Project Friday PM Peak Hour Traffic

Figure 3-2



Tachi Palace Hotel & Casino Expansion Project
Project Saturday PM Peak Hour Traffic

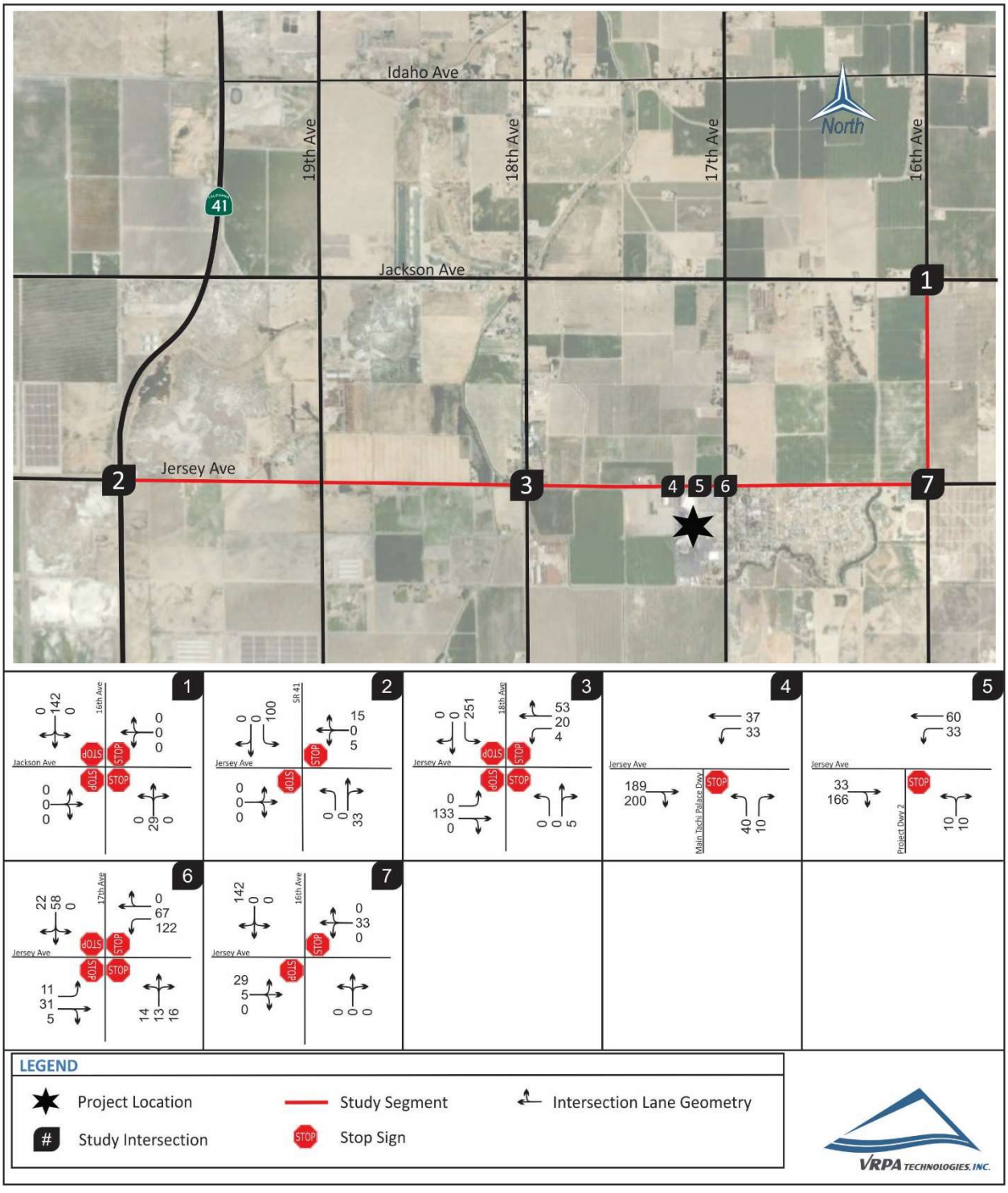
Figure 3-3



Tachi Palace Hotel & Casino Expansion Project

Project Friday PM Peak Hour Traffic - Special Event Inbound

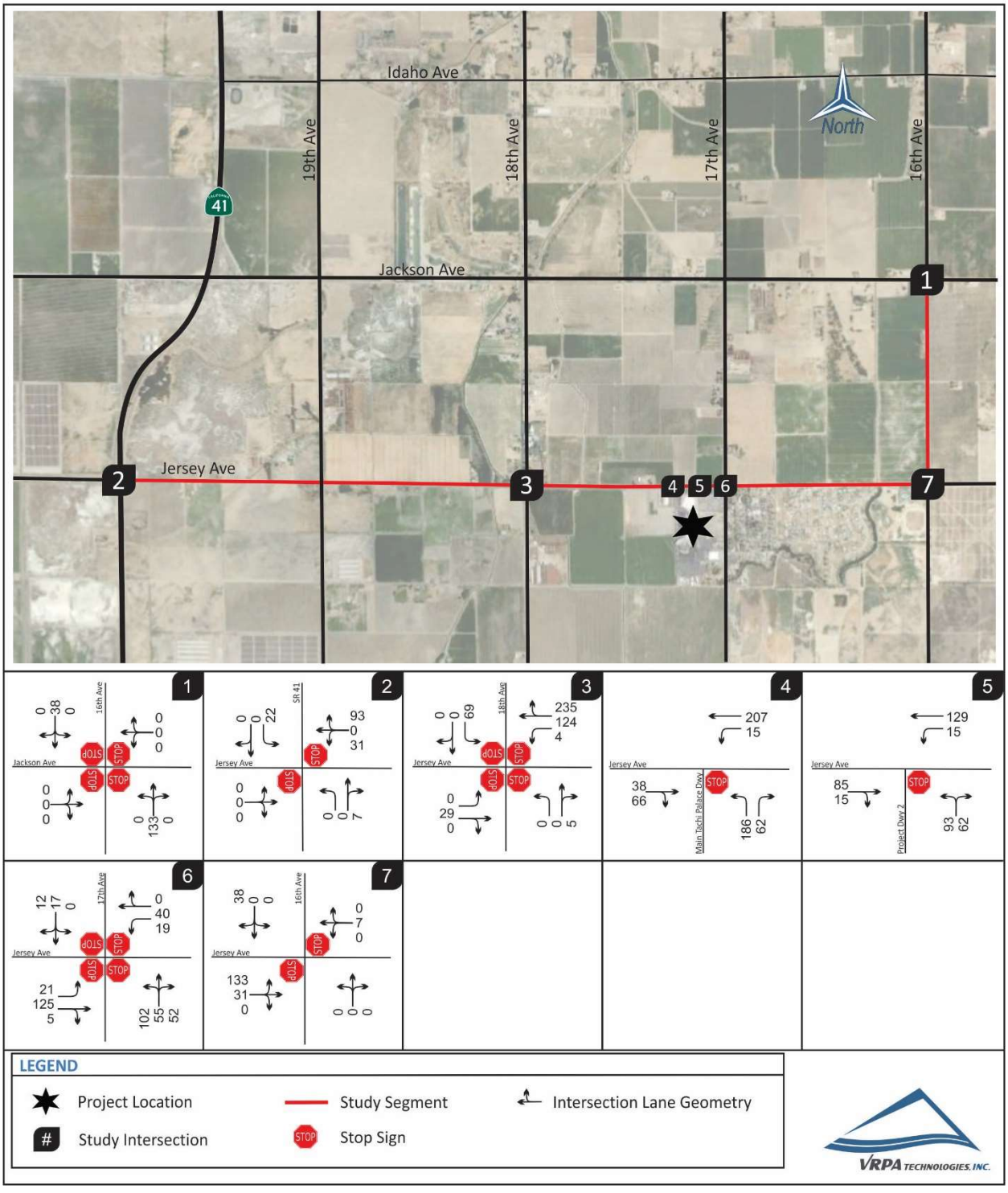
Figure 3-4



Tachi Palace Hotel & Casino Expansion Project

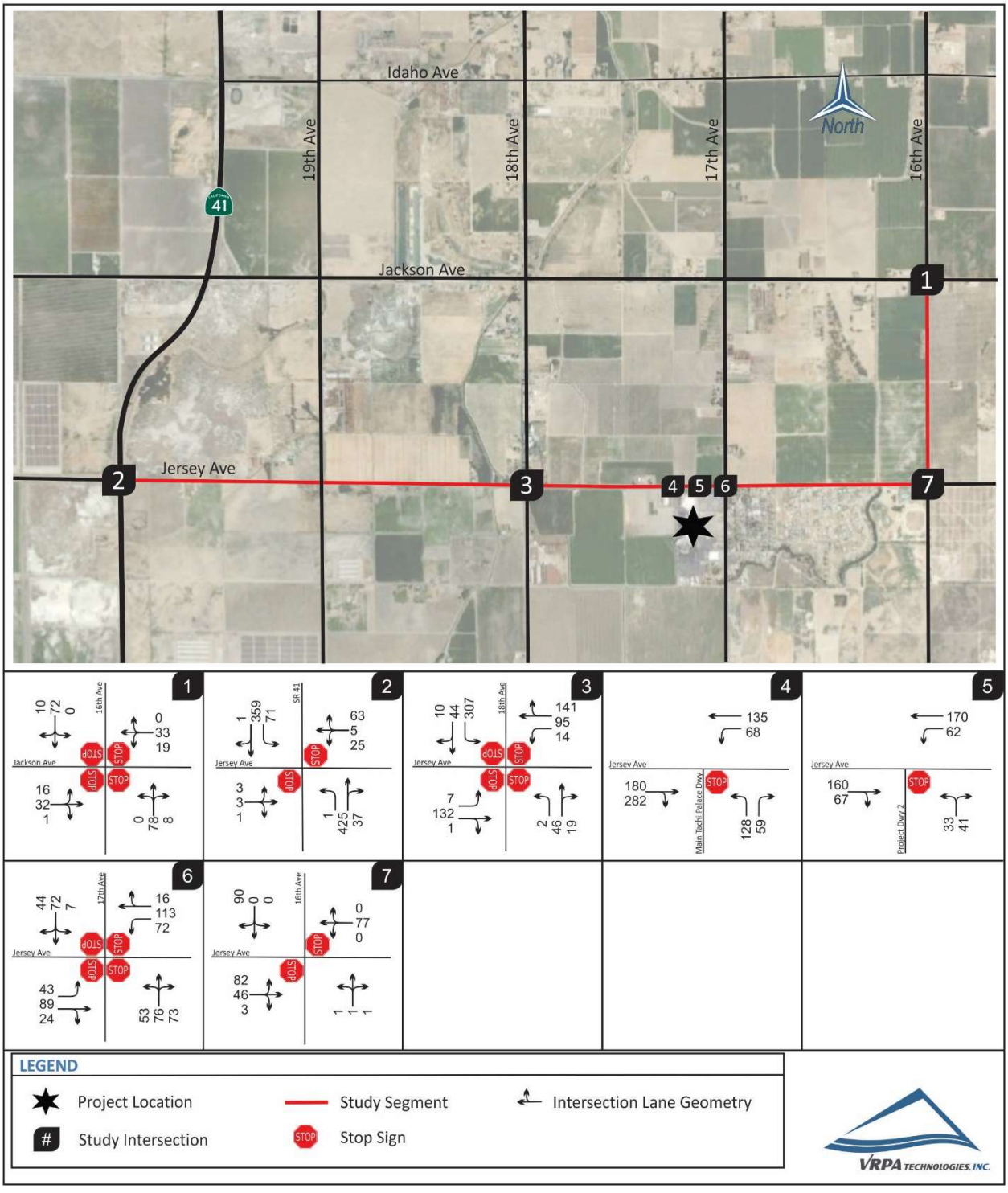
Project Friday PM Peak Hour Traffic - Special Event Outbound

Figure 3-5



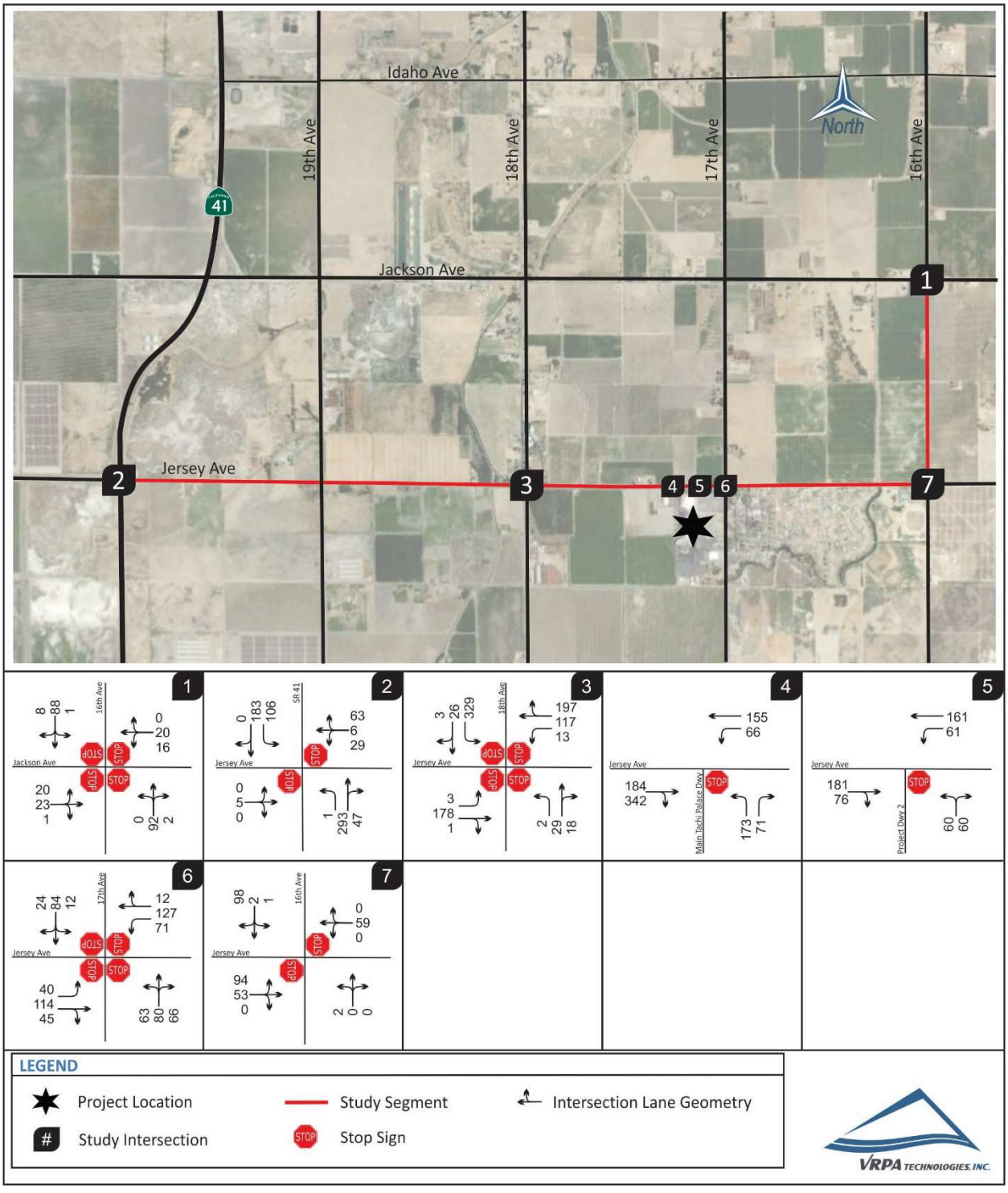
Tachi Palace Hotel & Casino Expansion Project
Existing Plus Project Friday PM Peak Hour Traffic

Figure 3-6



Tachi Palace Hotel & Casino Expansion Project
Existing Plus Project Saturday PM Peak Hour Traffic

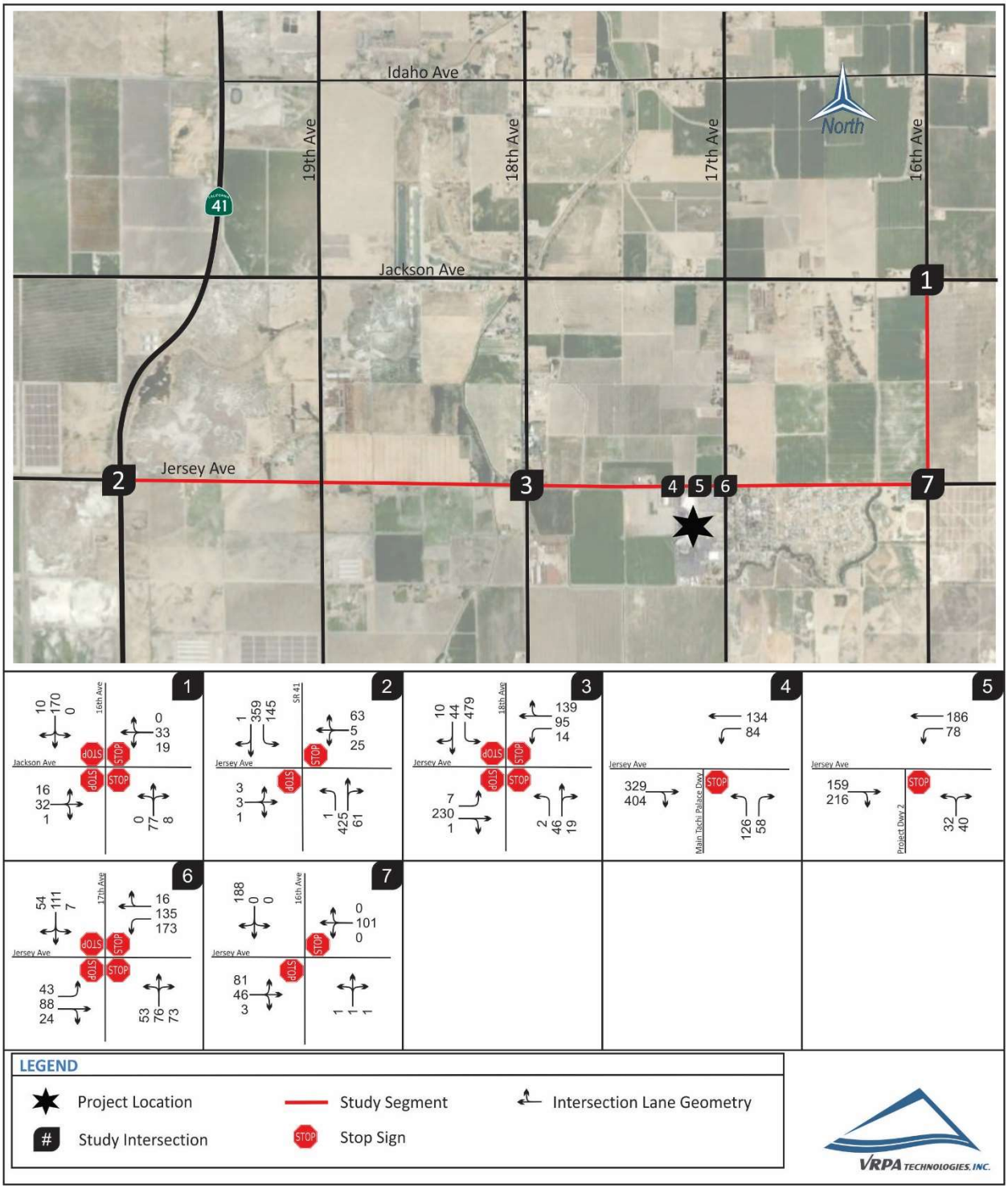
Figure 3-7



Tachi Palace Hotel & Casino Expansion Project

Existing Plus Project Friday PM Peak Hour Traffic - Special Event Inbound

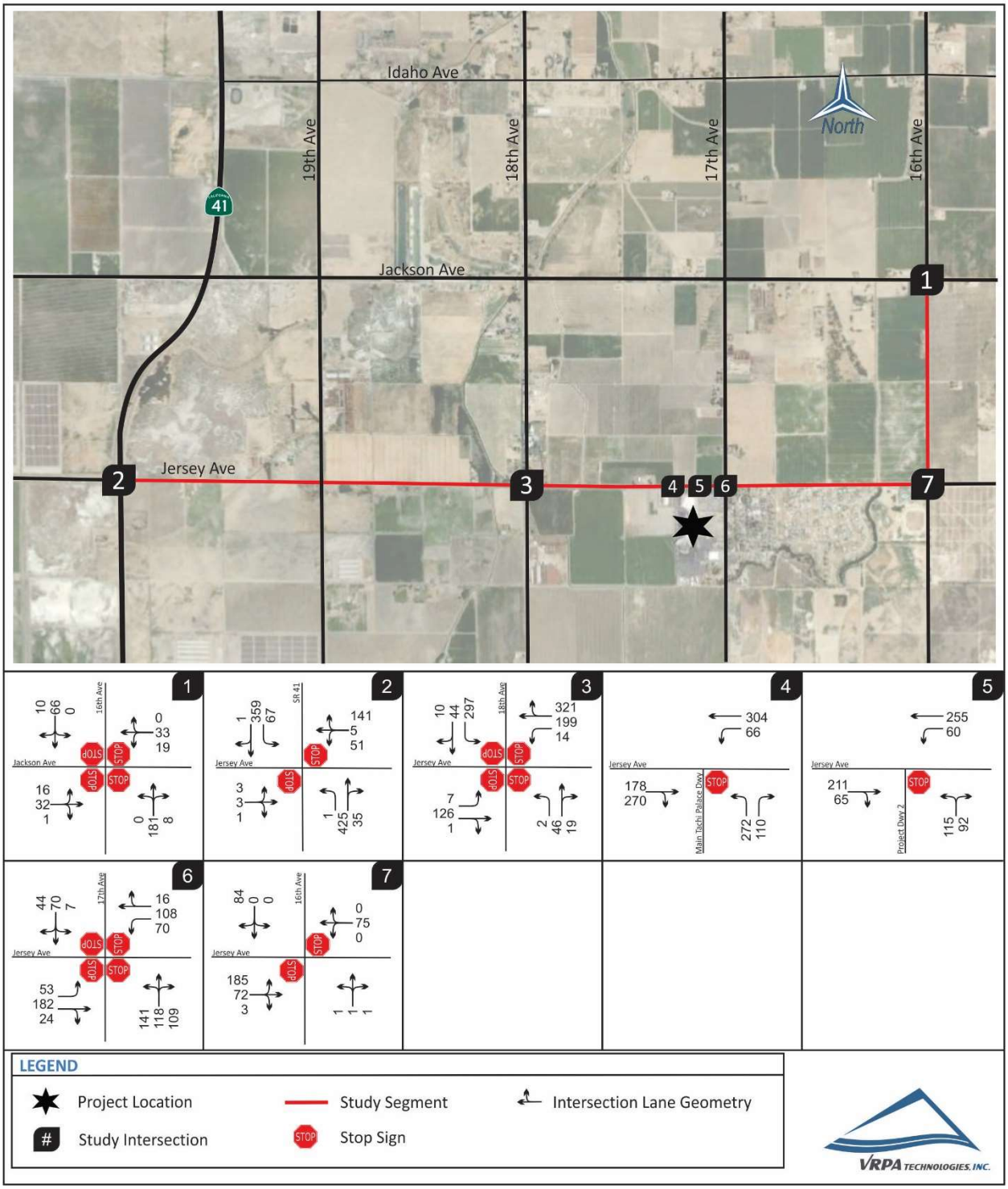
Figure 3-8



Tachi Palace Hotel & Casino Expansion Project

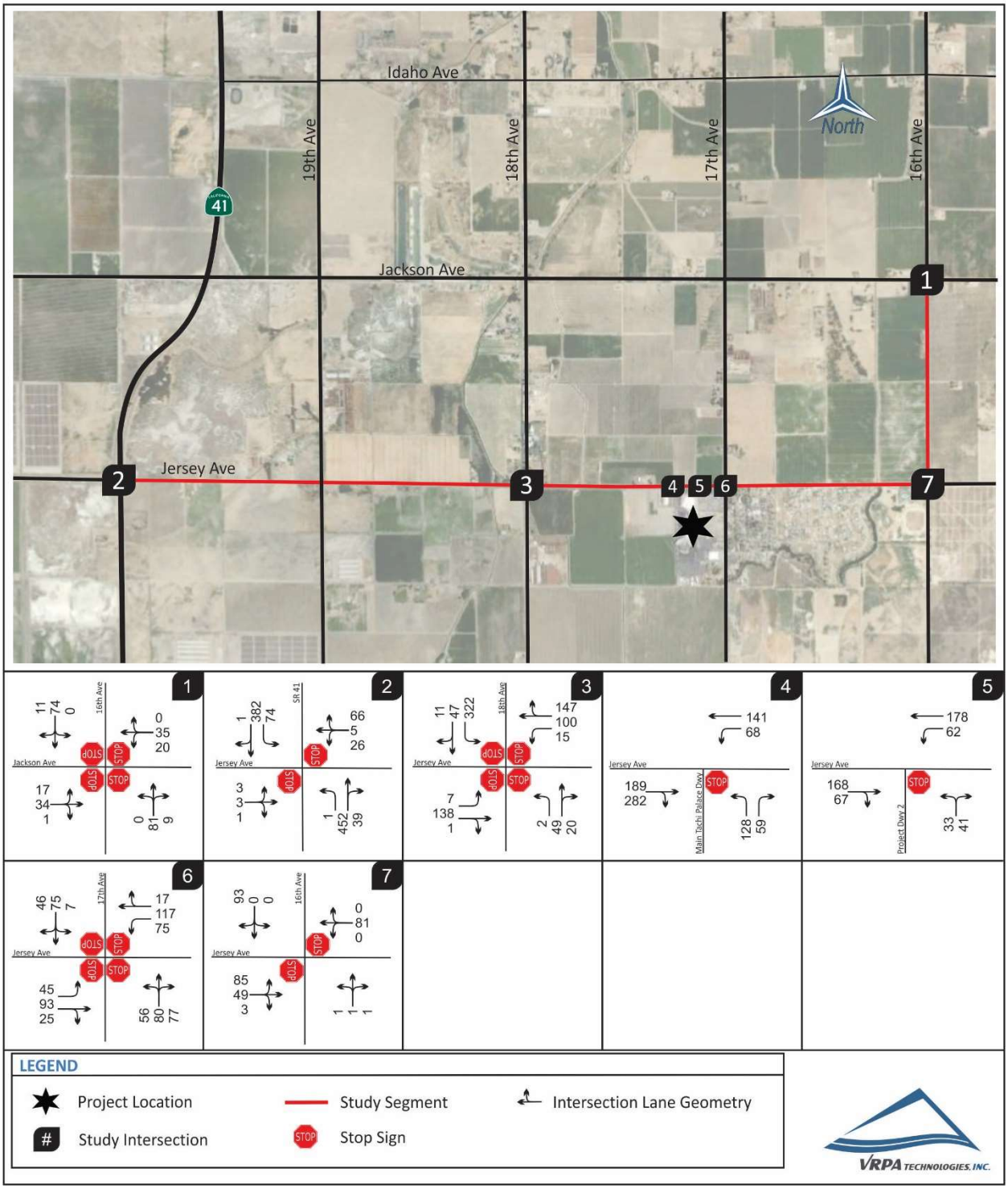
Existing Plus Project Friday PM Peak Hour Traffic - Special Event Outbound

Figure 3-9



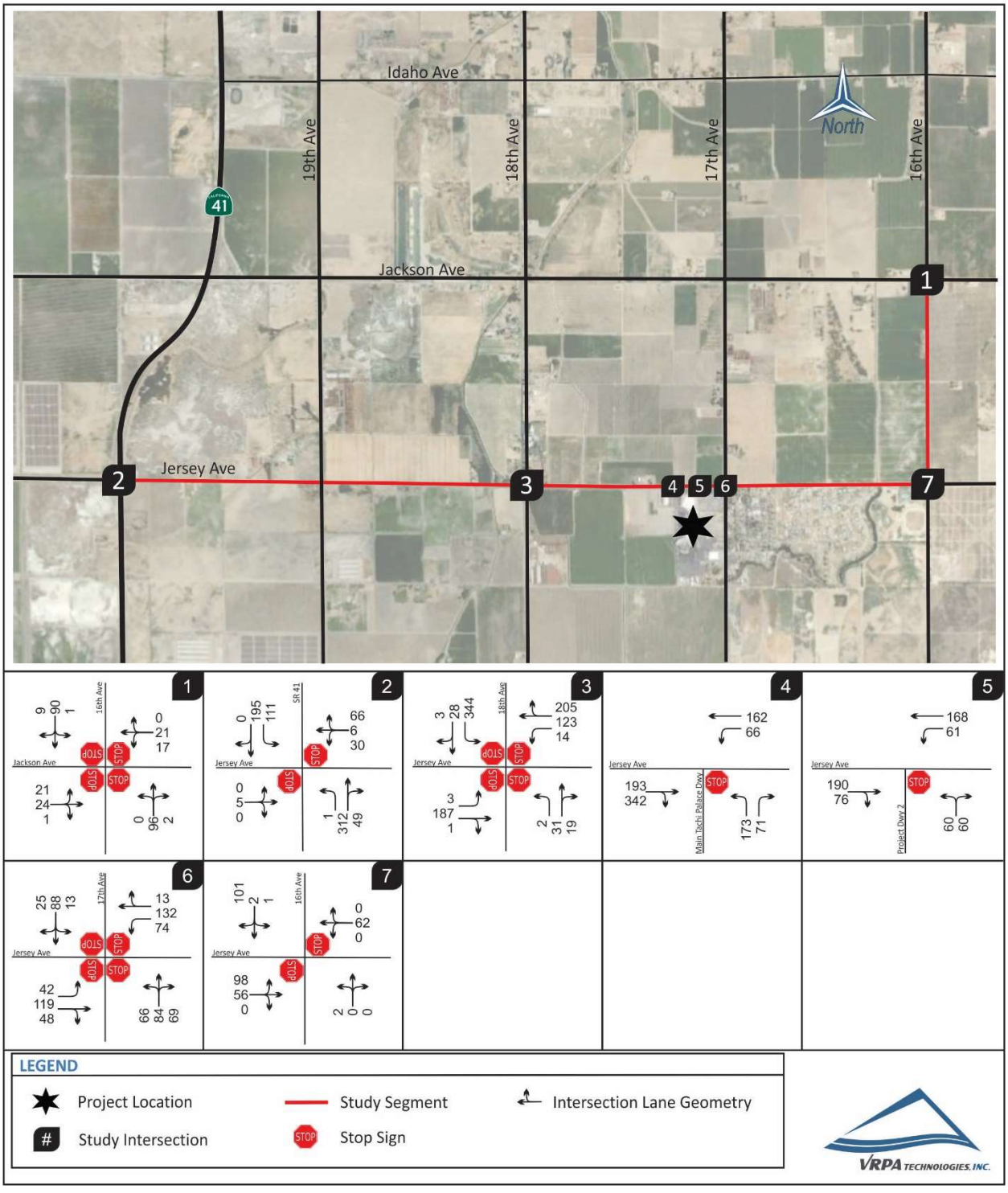
Tachi Palace Hotel & Casino Expansion Project
Near-Term Plus Project Friday PM Peak Hour Traffic

Figure 3-10



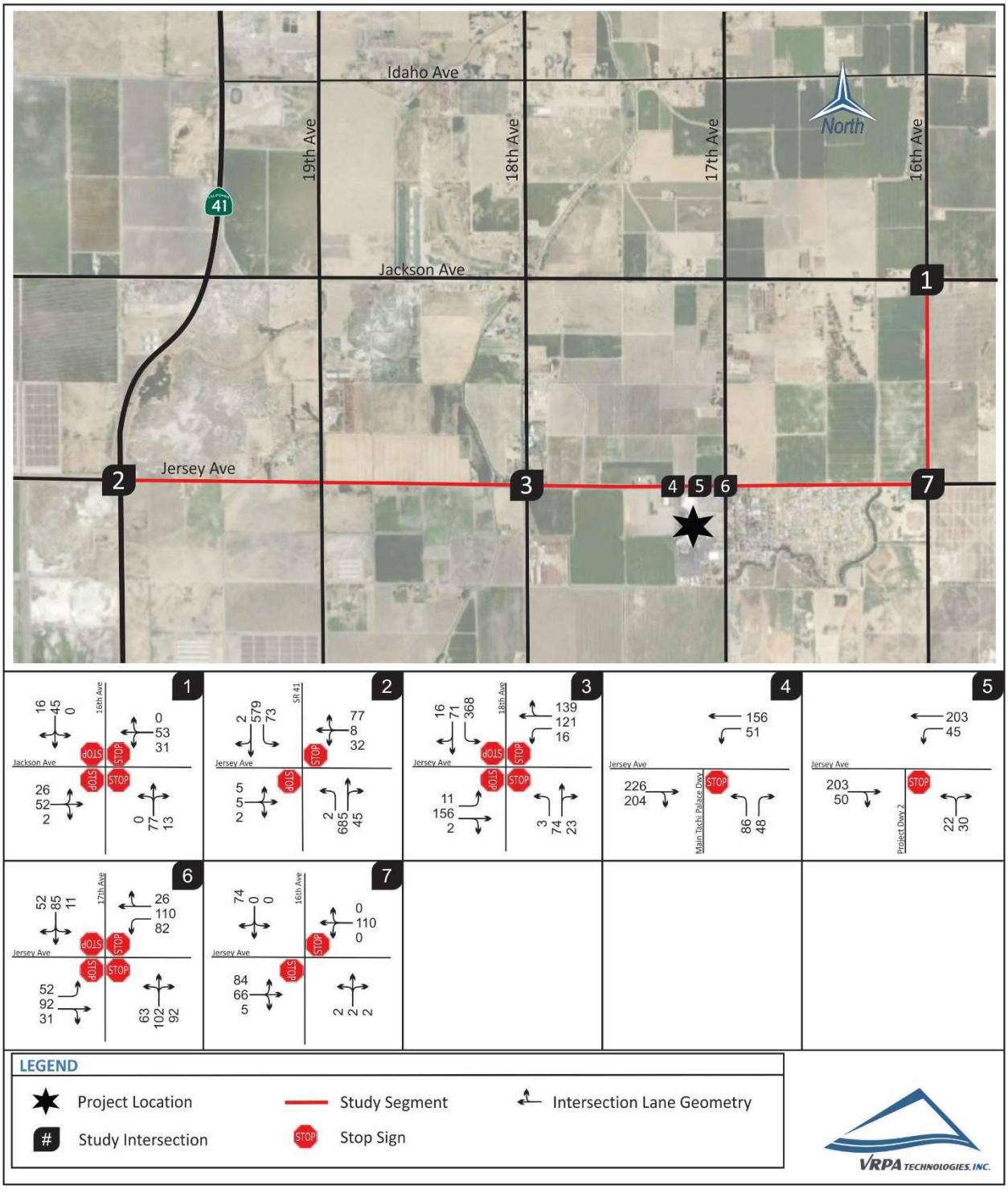
Tachi Palace Hotel & Casino Expansion Project
Near-Term Plus Project Saturday PM Peak Hour Traffic

Figure 3-11



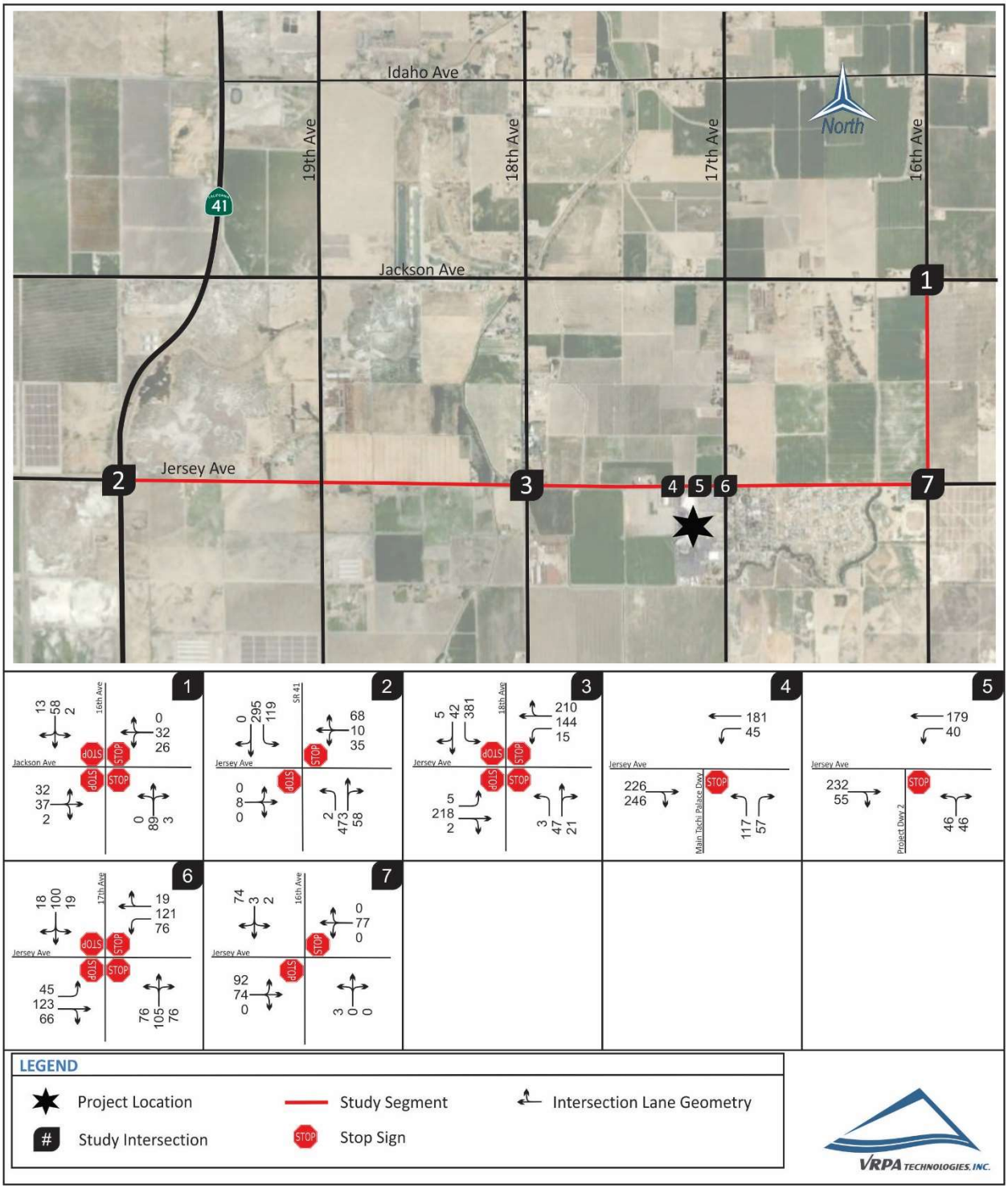
Tachi Palace Hotel & Casino Expansion Project
Cumulative Year 2043 Without Project Friday PM Peak Hour Traffic

Figure 3-12



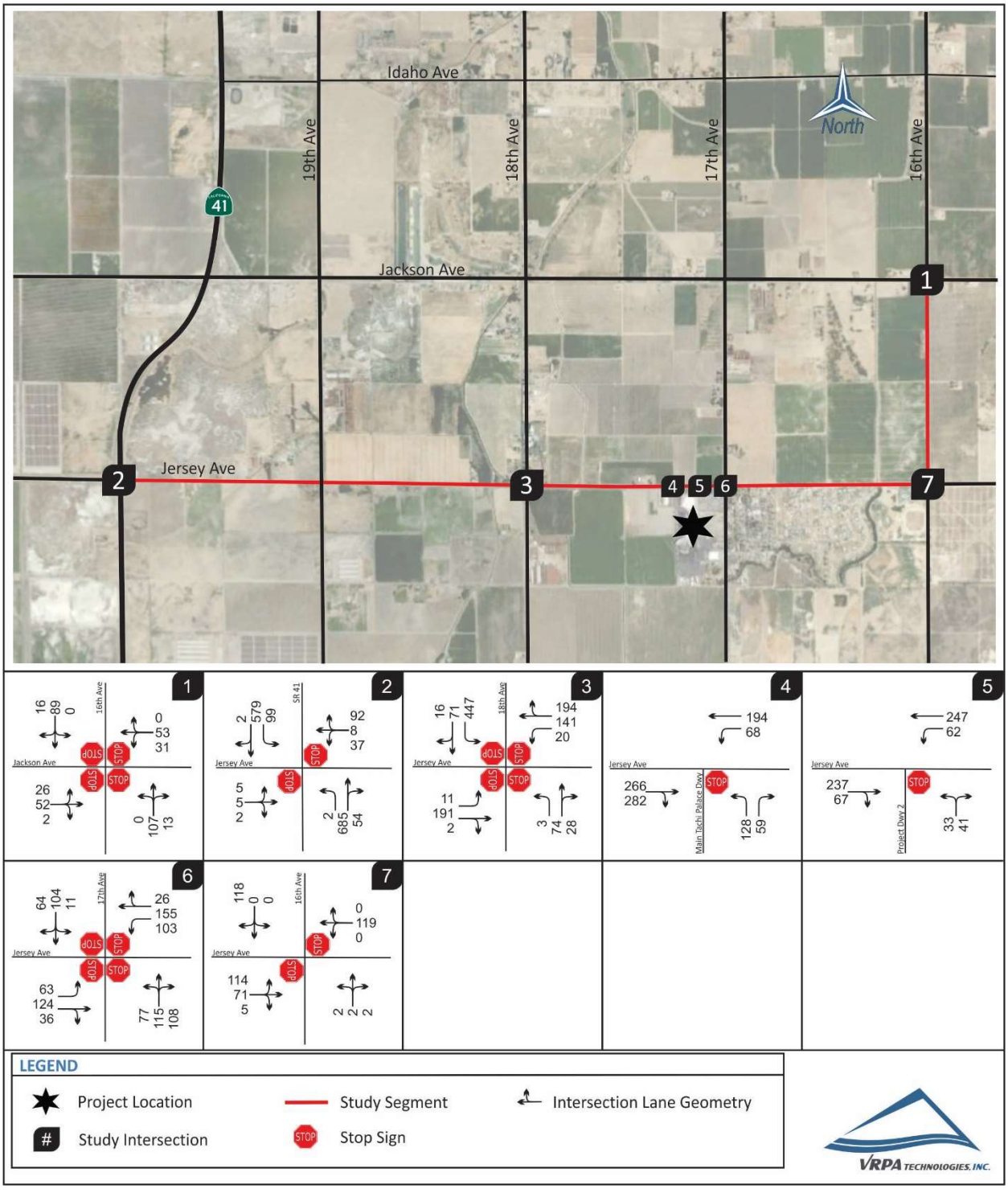
Tachi Palace Hotel & Casino Expansion Project
Cumulative Year 2043 Without Project Saturday PM Peak Hour Traffic

Figure 3-13



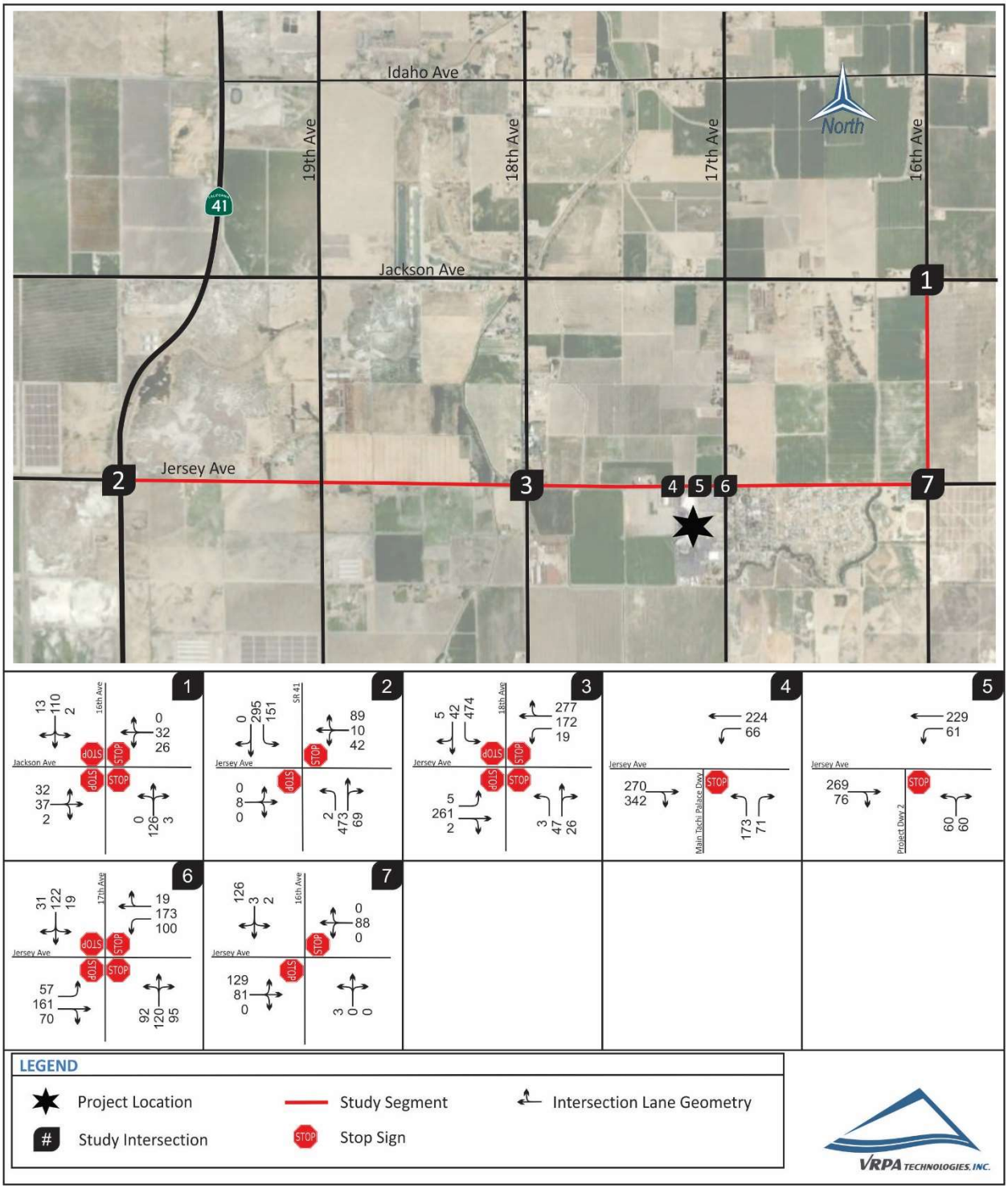
Tachi Palace Hotel & Casino Expansion Project
Cumulative Year 2043 Plus Project Friday PM Peak Hour Traffic

Figure 3-14



Tachi Palace Hotel & Casino Expansion Project
Cumulative Year 2043 Plus Project Saturday PM Peak Hour Traffic

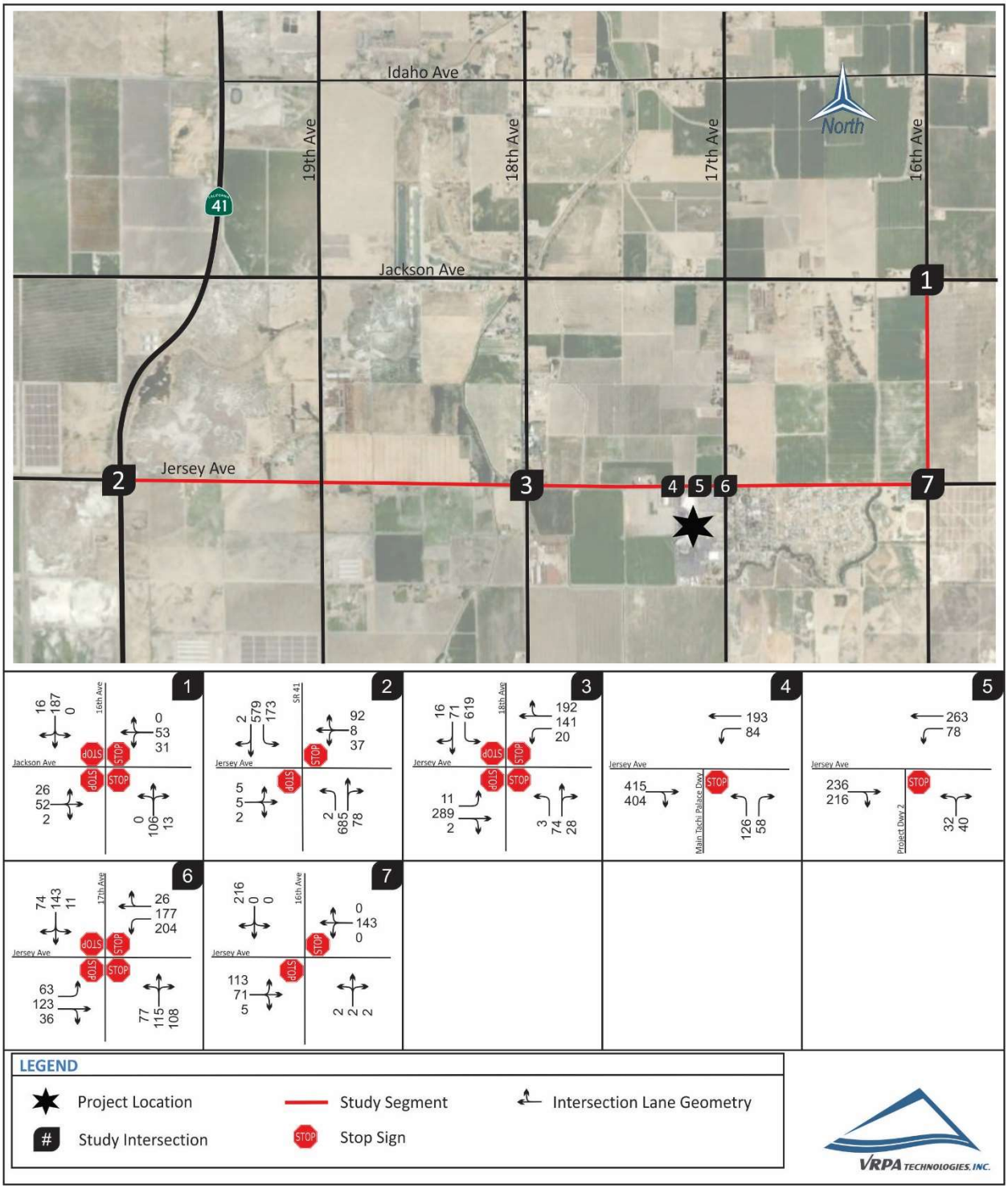
Figure 3-15



Tachi Palace Hotel & Casino Expansion Project

Cumulative Year 2043 Plus Project Friday PM Peak Hour Traffic - Special Event Inbound

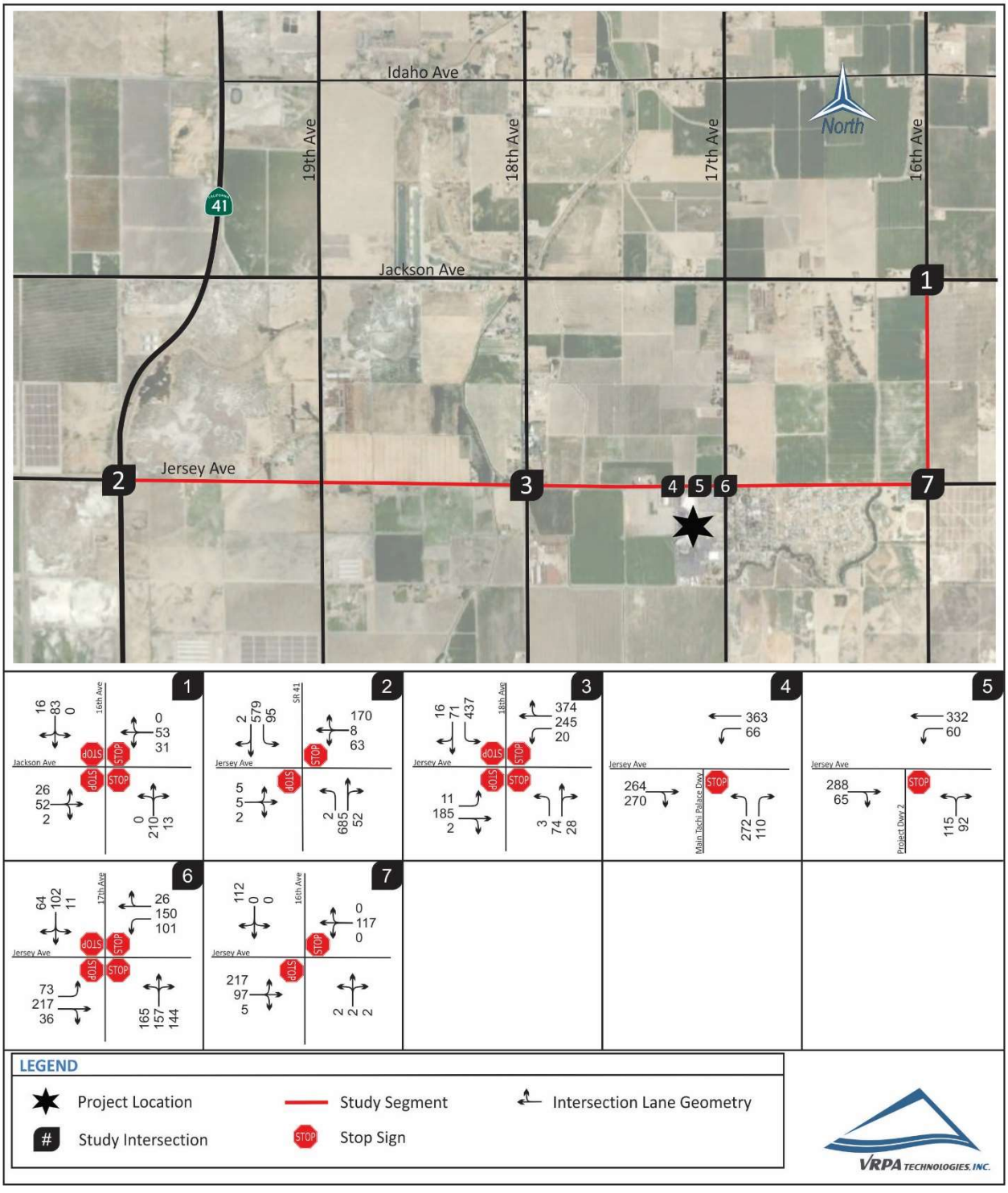
Figure 3-16



Tachi Palace Hotel & Casino Expansion Project

Cumulative Year 2043 Plus Project Friday PM Peak Hour Traffic - Special Event Outbound

Figure 3-17



3.8 Impacts

3.8.1 *Intersection Capacity Analysis*

Tables 3-3 and 3-4 show intersections that are expected to fall short of desirable operating conditions for various scenarios. Potential mitigation measures are discussed in Chapter 4 of this report. Results of the analysis show that the Project will result in a direct project-specific impact at one (1) of the seven (7) study intersections, as shown below, when comparing the Existing and Existing Plus Project scenarios.

- ✓ Jersey Avenue at SR 41

Results of the analysis also show that the Project will result in a cumulative impact at two (2) of the seven (7) study intersections, as shown below, when comparing the Cumulative Year 2043 Without Project and Cumulative Year 2043 Plus Project scenarios.

- ✓ Jersey Avenue at SR 41
- ✓ Jersey Avenue at 18th Avenue

Special Event Assessment

Results of the analysis show that the Project will result in a direct project-specific impact at three (3) of the seven (7) study intersections, as shown below, when comparing the Existing and Existing Plus Project scenarios.

- ✓ Jersey Avenue at SR 41
- ✓ Jersey Avenue at 18th Avenue
- ✓ Jersey Avenue at Main Tachi Palace Hotel & Casino Driveway

Results of the analysis also show that the Project will result in a cumulative impact at three (3) of the seven (7) study intersections, as shown below, when comparing the Cumulative Year 2043 Without Project and Cumulative Year 2043 Plus Project scenarios.

- ✓ Jersey Avenue at SR 41
- ✓ Jersey Avenue at 18th Avenue
- ✓ Jersey Avenue at Main Tachi Palace Hotel & Casino Driveway

Table 3-3
Intersection Operations

INTERSECTION	CONTROL	TARGET LOS	PEAK HOUR	EXISTING PLUS PROJECT		NEAR-TERM PLUS PROJECT		CUMULATIVE YEAR 2043 WITHOUT PROJECT		CUMULATIVE YEAR 2043 PLUS PROJECT	
				DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
1. Jackson Avenue / 16th Avenue	Four-Way Stop Sign	D	FRIDAY PM	8.0	A	8.1	A	7.9	A	8.3	A
			SATURDAY PM	8.2	A	8.3	A	7.9	A	8.3	A
2. Jersey Avenue / SR 41	Two-Way Stop Sign	C	FRIDAY PM	**27.4**	**D +**	**30.2**	**D ++**	**68.4**	**F ++**	**112.1**	**F ++**
			SATURDAY PM	18.7	C	19.8	C	**28.1**	**D ++**	**38.0**	**E ++**
3. Jersey Avenue / 18th Avenue	Four-Way Stop Sign	D	FRIDAY PM	15.8	C	17.2	C	18.6	C	**38.2**	**E ++**
			SATURDAY PM	18.0	C	20.4	C	26.7	D	**69.8**	**F ++**
4. Jersey Avenue / Main Tachi Palace Driveway	One-Way Stop Sign	D	FRIDAY PM	17.5	C	17.8	C	13.7	B	17.4	C
			SATURDAY PM	17.7	C	18.0	C	14.6	B	20.5	C
5. Jersey Avenue / Project Driveway 2	One-Way Stop Sign	D	FRIDAY PM	11.7	B	11.8	B	11.0	B	12.1	B
			SATURDAY PM	12.1	B	12.2	B	11.7	B	13.2	B
6. Jersey Avenue / 17th Avenue	Four-Way Stop Sign	D	FRIDAY PM	10.8	B	11.1	B	10.9	B	13.0	B
			SATURDAY PM	10.9	B	11.3	B	11.5	B	14.7	B
7. Jersey Avenue / 16th Avenue	Two-Way Stop Sign	D	FRIDAY PM	10.9	B	11.1	B	10.7	B	11.5	B
			SATURDAY PM	7.6	A	7.6	A	7.4	A	7.5	A

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For four-way stop intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

+ Does not meet peak hour signal warrants.

++ Meets peak hour signal warrants.

Table 3-4
Special Event Intersection Operations

INTERSECTION	CONTROL	TARGET LOS	PEAK HOUR	EXISTING PLUS PROJECT		CUMULATIVE YEAR 2043 PLUS PROJECT	
				DELAY	LOS	DELAY	LOS
1. Jackson Avenue / 16th Avenue	Four-Way Stop Sign	D	FRIDAY PM - INBOUND	8.8	A	8.8	A
			FRIDAY PM - OUTBOUND	8.7	A	9.0	A
2. Jersey Avenue / SR 41	Two-Way Stop Sign	C	FRIDAY PM - INBOUND	**38.6**	**E**	**243.4**	**F**
			FRIDAY PM - OUTBOUND	**42.4**	**E**	**>300.0**	**F ++**
3. Jersey Avenue / 18th Avenue	Four-Way Stop Sign	D	FRIDAY PM - INBOUND	**61.7**	**F**	**116.3**	**F**
			FRIDAY PM - OUTBOUND	**36.9**	**E**	**99.5**	**F**
4. Jersey Avenue / Main Tachi Palace Driveway	One-Way Stop Sign	D	FRIDAY PM - INBOUND	24.7	C	23.7	C
			FRIDAY PM - OUTBOUND	**73.0**	**F**	**44.3**	**E**
5. Jersey Avenue / Project Driveway 2	One-Way Stop Sign	D	FRIDAY PM - INBOUND	12.8	B	13.1	B
			FRIDAY PM - OUTBOUND	18.8	C	17.7	C
6. Jersey Avenue / 17th Avenue	Four-Way Stop Sign	D	FRIDAY PM - INBOUND	12.4	B	15.8	C
			FRIDAY PM - OUTBOUND	19.2	C	29.5	D
7. Jersey Avenue / 16th Avenue	Two-Way Stop Sign	D	FRIDAY PM - INBOUND	12.0	B	12.7	B
			FRIDAY PM - OUTBOUND	13.9	B	13.7	B

DELAY is measured in seconds
LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded
For four-way stop intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.
++ Delay Exceeds 300 seconds.

3.8.2 Queuing *Analysis*

Tables 3-5 and 3-6 provide a queue length summary for left and right turn lanes at the study intersections for the study scenarios identified previously. The queuing analyses is based upon methodology presented in Chapter 400 of Caltrans' HDM. The queue results shown in Tables 3-5 and 3-6 represent the approximate queue lengths for the respective lane movements.

3.8.3 *Roadway Segment Capacity Analysis*

Table 3-7 shows roadway segment analysis results along the existing street and highway system. The performance criteria used for evaluating volumes and capacities on the road and highway system for this study are discussed in Section 1.2.2. Results of the analysis show that all of the roadway segments are projected to operate at acceptable levels of service through the Cumulative Year 2043 Plus Project scenario.

Table 3-5
Queuing Operations

INTERSECTION	EXISTING QUEUE STORAGE LENGTH (ft)		EXISTING PLUS PROJECT		NEAR-TERM PLUS PROJECT		CUMULATIVE YEAR 2043 WITHOUT PROJECT		CUMULATIVE YEAR 2043 PLUS PROJECT	
			Friday PM Queue	Saturday PM Queue	Friday PM Queue	Saturday PM Queue	Friday PM Queue	Saturday PM Queue	Friday PM Queue	Saturday PM Queue
Jersey Avenue / SR 41	NB Left	425	1	1	1	1	2	2	2	2
	SB Left	425	59	88	62	93	61	99	83	126
Jersey Avenue / 18th Avenue	NB Left	100	2	2	2	2	3	3	3	3
	SB Left	100	**256**	**274**	**268**	**287**	**307**	**318**	**373**	**395**
	EB Left	200	6	3	6	3	9	4	9	4
	WB Left	100	12	11	13	12	13	13	24	16
Jersey Avenue / Main Tachi Palace Driveway	NB Right	75	49	59	49	59	40	48	49	59
	WB Left	100	57	55	57	55	43	38	57	55
Jersey Avenue / Project Driveway 2	WB Left	100	52	51	52	51	38	33	52	51
Jersey Avenue / 17th Avenue	EB Left	100	36	33	38	35	43	38	53	48
	WB Left	100	60	59	63	62	68	63	86	83

Queue is measured in feet / **BOLD** denotes exceedance

Table 3-6
Special Event Queuing Operations

INTERSECTION	EXISTING QUEUE STORAGE LENGTH (ft)		EXISTING PLUS PROJECT		CUMULATIVE YEAR 2043 PLUS PROJECT	
			Friday PM Inbound Queue	Friday PM Outbound Queue	Friday PM Inbound Queue	Friday PM Outbound Queue
Jersey Avenue / SR 41	NB Left	425	1	1	2	2
	SB Left	425	121	56	144	79
Jersey Avenue / 18th Avenue	NB Left	100	2	2	3	3
	SB Left	100	**399**	**248**	**516**	**364**
	EB Left	200	6	6	9	9
	WB Left	100	12	12	17	17
Jersey Avenue / Main Tachi Palace Driveway	NB Right	75	48	**92**	48	**92**
	WB Left	100	70	55	70	55
Jersey Avenue / Project Driveway 2	WB Left	100	65	50	65	50
Jersey Avenue / 17th Avenue	EB Left	100	36	44	53	61
	WB Left	100	**144**	58	**170**	84

Queue is measured in feet / **BOLD** denotes exceedance

Table 3-7
Segment Operations

STREET SEGMENT	SEGMENT DESCRIPTION	TARGET LOS	PEAK HOUR	DIRECTION	EXISTING PLUS PROJECT		NEAR-TERM PLUS PROJECT		CUMULATIVE YEAR 2043 WITHOUT PROJECT		CUMULATIVE YEAR 2043 PLUS PROJECT	
					VOLUME	LOS	VOLUME	LOS	VOLUME	LOS	VOLUME	LOS
16th Avenue												
Jackson Avenue to Jersey Avenue	2 Lanes Undivided	D	Friday PM	NB	86	A	90	A	90	A	120	A
				SB	92	A	95	A	77	A	121	A
			Saturday PM	NB	94	A	98	A	92	A	129	A
				SB	105	A	108	A	85	A	137	A
Jersey Avenue												
SR 41 to 18th Avenue	2 Lanes Undivided	D	Friday PM	EB	140	A	147	A	169	A	204	A
				WB	107	A	113	A	140	A	160	A
			Saturday PM	EB	182	A	191	A	224	A	267	A
				WB	122	A	128	A	152	A	180	A
18th Avenue to 17th Avenue	2 Lanes Undivided	D	Friday PM	EB	458	C	480	C	547	C	666	D
				WB	250	A	261	A	276	B	355	B
			Saturday PM	EB	525	C	550	C	619	C	760	D
				WB	327	B	342	B	368	B	467	C
17th Avenue to 16th Avenue	2 Lanes Undivided	D	Friday PM	EB	169	A	177	A	195	B	243	B
				WB	201	A	210	A	218	A	284	B
			Saturday PM	EB	192	B	201	B	218	B	275	B
				WB	210	A	219	A	216	A	292	B

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

4.0 Mitigation

As discussed in Section 3.0 Impacts, the potentially significant impacts resulting from the Project relate to the generation of unacceptable LOS at various intersections both in the near term and long term. Described below are improvements at study area intersections and segments for various scenarios that would result in acceptable levels of service. In order to mitigate the Project's impacts, it is recommended that the Project contribute traffic impact fees, as determined by Kings County. The payment of these fair-share fees would be used to help fund the applicant's fair-share percentage of the improvements discussed below to mitigate the Project's traffic impacts to less than significant levels.

Considering the criteria provided in Section 1.3 and the results presented in Section 3.0, the following improvements are recommended to alleviate project-specific impacts. The existing road network can be mitigated to ease many of the impacts of the Project and projected future traffic through the year 2043.

Improvements were not identified for the Special Event scenarios given the limited number of special events to be hosted at the Project site. Traffic associated with special events does not reflect typical daily operations. Instead, a traffic control plan consistent with Kings County guidelines shall be prepared for special events occurring at the Project site.

4.1 Recommended Improvements

INTERSECTIONS

✓ Jersey Avenue / SR 41
Recommended improvements to achieve acceptable levels of service:

- Existing Plus Project scenario:
  - Widen the westbound approach to 1 left turn lane and 1 through lane with a shared right (adding 1 left turn lane)

- Near-Term Plus Project and Cumulative Year 2043 Plus Project scenarios:
  - Install Traffic Signal

The improvements identified above for the Existing Plus Project scenario are not sufficient to meet the existing MOE at the intersection. The intersection does not meet the peak hour signal warrant (CA MUTCD Warrant 3) under Existing Plus Project conditions.

The improvements identified above for the Near-Term Plus Project and Cumulative Year 2043 Plus Project scenarios are sufficient to meet the existing MOE at the intersection.

- ✓ Jersey Avenue / 18th Avenue
  Recommended improvements to achieve acceptable levels of service:
  - Cumulative Year 2043 Plus Project scenario:
    - Install Traffic Signal

  The improvements identified above for the Cumulative Year 2043 Plus Project scenario are sufficient to meet Kings County's level of service criteria as identified in the 2035 General Plan.

Post-Mitigation Level of Significance

The level of service resulting from the potential improvements identified above is shown in Table 4-1 for study area intersections. The resulting recommended improvements are shown in Figure 4-1. The improvements identified in Figure 4-1 reflects recommended improvements for the Cumulative Year 2043 Plus Project scenario.

In addition to the proposed improvements identified above, Table 4-2 identifies left turn and right pocket lengths required for the Cumulative Year 2043 scenario. The determination of the recommended storage length was determined by the queuing analysis.

4.2 Equitable Share Responsibility

The Project will be required to contribute a fair share towards the costs of improvements that are identified for the Cumulative Year 2043 scenario. The intent of determining the equitable responsibility for the improvements identified above for the Cumulative Year 2043 scenario, is to provide a starting point for early discussions between the applicant and the County to address traffic mitigation equitability and to calculate the equitable share for mitigating traffic impacts. The formulas used to calculate the equitable share responsibility is as follows:

Equitable Share = (Project Trips)/(Future Year Plus Project Traffic – Existing Traffic)

Table 4-3 shows the Project's equitable share responsibility on a percentage basis for improvements to the study area as described above. The equitable share responsibility shown in Table 4-3 is the result of LOS enhancements related to capacity.

Table 4-1
Intersection Operations with Mitigation

INTERSECTION	TARGET LOS	PEAK HOUR	EXISTING PLUS PROJECT		NEAR-TERM PLUS PROJECT		CUMULATIVE YEAR 2043 PLUS PROJECT	
			DELAY	LOS	DELAY	LOS	DELAY	LOS
2. Jersey Avenue / SR 41	C	FRIDAY PM	**31.8**	**D +**	9.9	A	12.3	B
		SATURDAY PM	20.7	C	10.5	B	12.7	B
3. Jersey Avenue / 18th Avenue	D	FRIDAY PM					24.4	C
		SATURDAY PM					32.9	C

DELAY is measured in seconds
LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded
+ Does not meet peak hour signal warrants.

Tachi Palace Hotel & Casino Expansion Project
Cumulative Year 2043 Lane Geometry

Figure 4-1

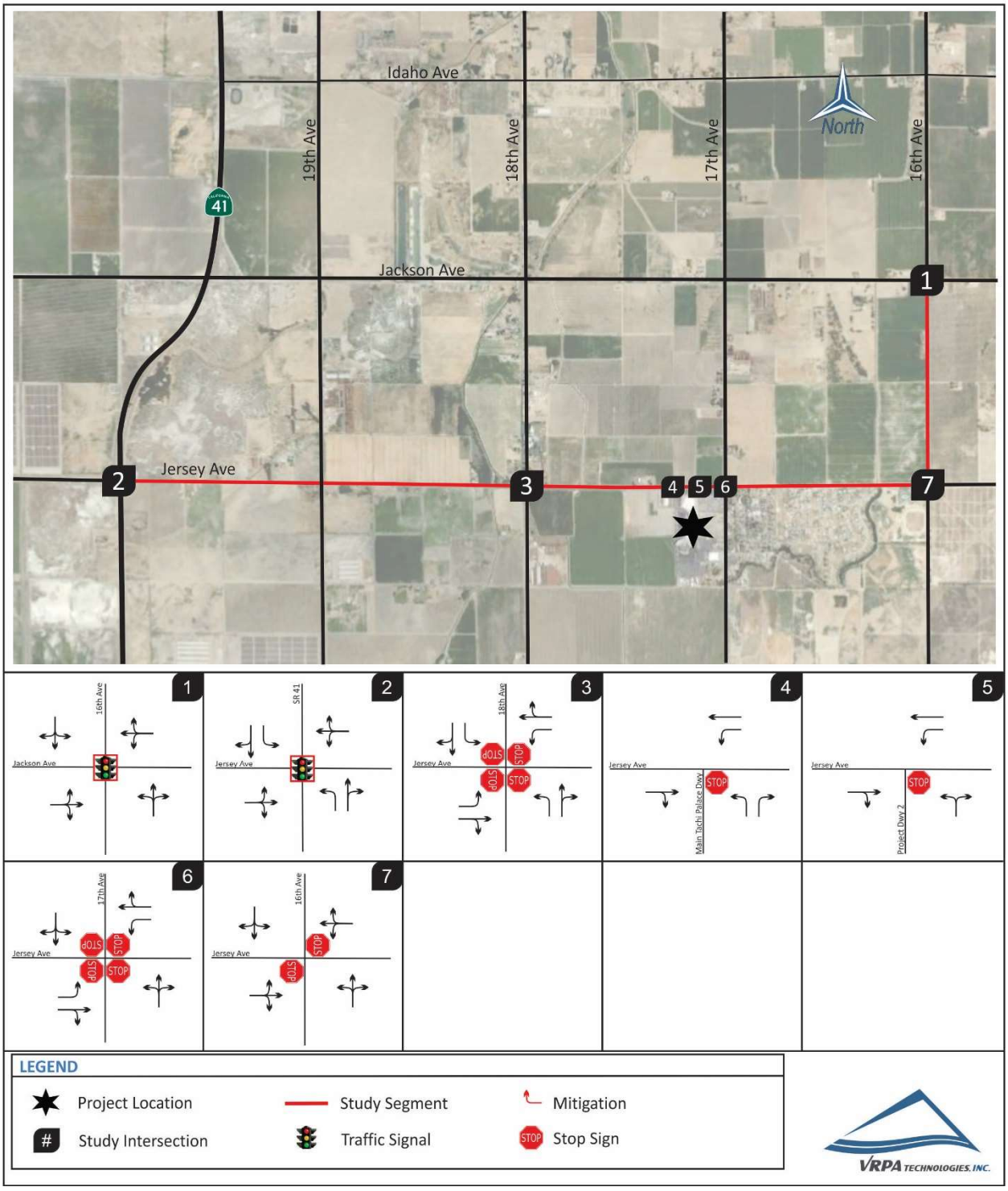


Table 4-2
Left Turn and Right Turn Storage Requirements

INTERSECTION	EXISTING QUEUE STORAGE LENGTH (ft)		CUMULATIVE YEAR 2043 RECOMMENDED STORAGE LENGTH (ft)
Jersey Avenue / SR 41	NB Left	425	425
	SB Left	425	425
Jersey Avenue / 18th Avenue	NB Left	100	100
	SB Left	100	**400**
	EB Left	200	200
	WB Left	100	100
Jersey Avenue / Main Tachi Palace Driveway	NB Right	75	75
	WB Left	100	100
Jersey Avenue / Project Driveway 2	WB Left	100	100
Jersey Avenue / 17th Avenue	EB Left	100	100
	WB Left	100	100

BOLD denotes change in storage pocket length

Table 4-3
Equitable Share Responsibility

INTERSECTION	PEAK HOUR	EXISTING	PROJECT TRIPS	CUMULATIVE YEAR 2042 PLUS PROJECT	FAIR SHARE PERCENTAGE
Jersey Avenue / SR 41	FRIDAY PM	939	55	1,569	8.7%
	SATURDAY PM	662	71	1,139	14.9%
Jersey Avenue / 18th Avenue	FRIDAY PM	620	198	1,198	34.3%
	SATURDAY PM	676	240	1,330	36.7%

APPENDIX A

Preliminary Trip Generation Methodology and
Trip Distribution Memorandum

February 6, 2020

Dominic Tyburski, P.E., Chief Engineer
Kings County Department of Public Works
Engineering Division
1400 W. Lacey Blvd
Hanford CA 93230

Re: Preliminary Trip Generation Methodology and Trip Distribution for Tachi Palace Hotel & Casino Expansion Project

Dear Mr. Tyburski:

VRPA Technologies, Inc. (VRPA) prepared the following preliminary trip generation methodology and trip distribution assessment for the proposed Tachi Palace Hotel & Casino Expansion Project ("Project") in Kings County. This scoping document is intended to be used by the Santa Rosa Rancheria (Tribe) in approving a final scope of work for the required Project traffic analysis.

The Project is located along the south side of Jersey Avenue between 17th and 18th Avenues in the northern portion of Kings County (See Figure 1). The Project seeks to expand its existing operations at the casino. The expansion of the Tachi Palace Hotel & Casino includes the following:

- ✓ Expansion of main casino building to add up to 3,000 Class III gaming machines, as well as office space
- ✓ Addition of 300 hotel rooms
- ✓ New Event/Entertainment space with a seating capacity of 2,500
- ✓ 3-Story parking garage with 1200-1500 stalls
- ✓ New Parking lot with 700-800 stalls
- ✓ Expansion of the existing wastewater treatment facility (size, structure, and capacity)
- ✓ Improvements to the existing gas station, including the addition of a retail store, drive-thru carwash, and additional fuel dispensers at the current fuel station on site (both semi-truck dispensers, and conventional fuel dispensers)

Access to the existing site is provided by three (3) one-way stop controlled driveways along Jersey Avenue and four (4) one-way stop controlled driveways along 17th Avenue. The main access point to the site is provided along Jersey Avenue, approximately 1,300 feet west of 17th Avenue.

PROPOSED STUDY SCENARIOS

The traffic study for the Project proposes to include level of service (LOS) analysis for a Friday and/or Saturday peak hour for the traffic scenarios presented below. The exact peak hour periods to be evaluated will be determined by existing Friday/Saturday 24-hour counts at the existing Project Driveways and along Jersey Avenue.

4630 W. Jennifer, Suite 105, Fresno, CA 93722 • Phone (559) 271-1200 • Fax (559) 271-1269
www.vrpatechnologies.com

✓ Existing Conditions

The first step toward assessing Project traffic impacts is to assess existing traffic conditions. Existing peak hour turning movements will be collected at each study intersections once the appropriate peak hour of study has been determined as noted above.

✓ Existing Plus Project

VRPA will identify Existing Conditions Plus Project traffic considering the existing peak hour volumes and the Projects trip generation as discussed later in this document.

✓ Near-Term (Opening Year 2022) Plus Project

VRPA will identify Near-Term (Opening Year 2022) traffic impacts on the specified highway and street/road facilities, and intersections in the Study Area. VRPA will apply an appropriate annual growth rate to existing traffic counts (as adjusted), determined in consultation with Kings County, to reflect opening year conditions.

VRPA will work with Kings County to identify cumulative projects that will affect the study area. During the traffic modeling process (discussed below), VRPA will confirm with the Kings County Association of Governments (KCAG) that all of the applicable cumulative projects are included in the model's land use assumptions. Any projects not included will either be added to the model by KCAG, or manually accounted for in the future forecasts by VRPA.

VRPA will identify short- and long-term planned/programmed highway and street/road improvements along the study facilities. Short-term highway and street/road improvement projects are improvements that will be constructed within one to three (1-3) years of the present. Long-term highway and street/road improvement projects will be identified and considered during the Year 2042 impact analysis. Only improvement projects that are fully funded will be assumed as planned roadway projects for purposes of the analysis.

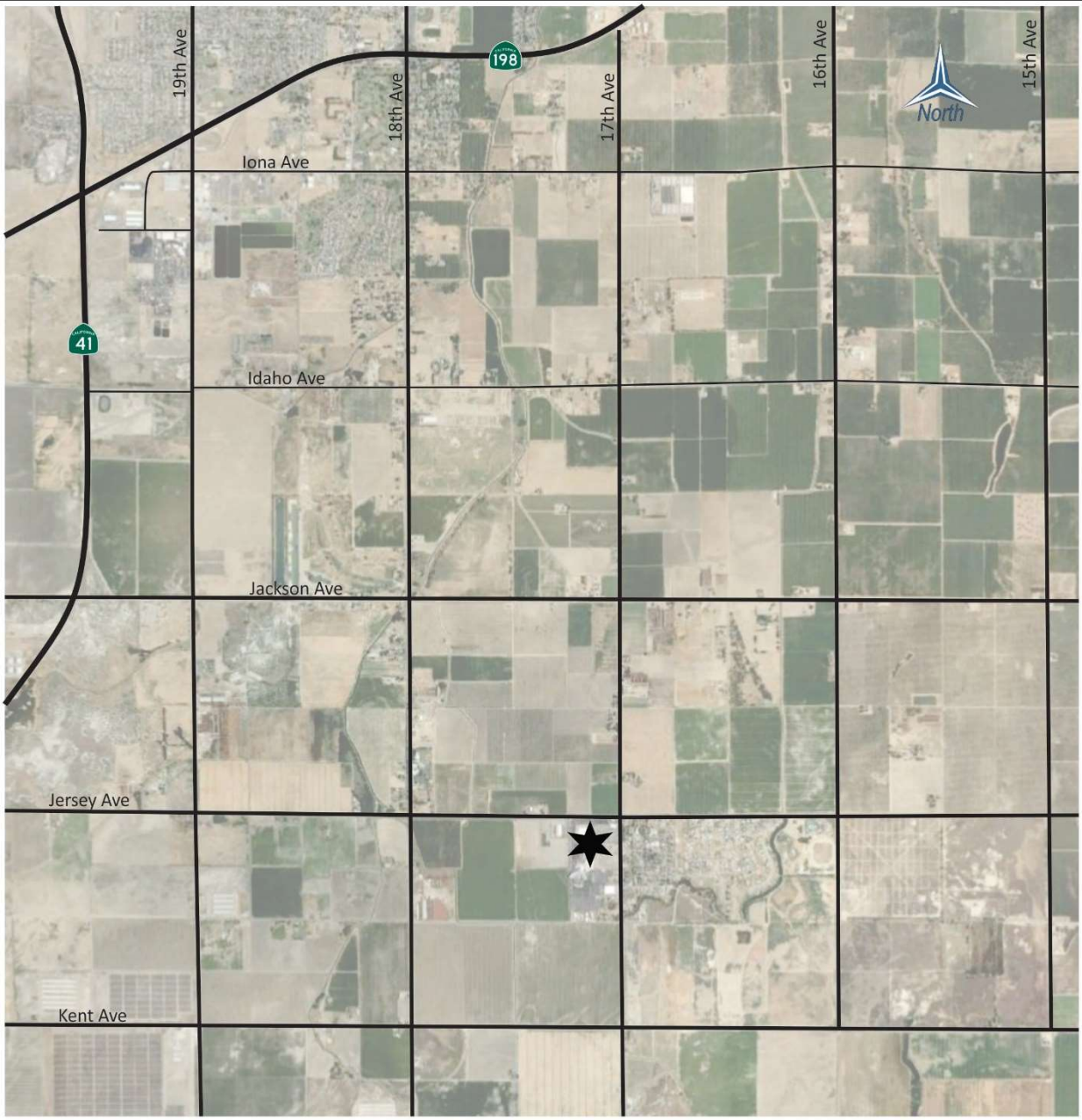
✓ Cumulative Year 2042 Without Project

VRPA will formally request a model run from KCAG for the future year (2042) and the existing year (2020) to serve as the baseline for development of future forecasts. Once both model runs are received, VRPA will compare the peak hour traffic volumes between both models and determine the percentage growth in the study area. This percentage growth will then be applied to the existing traffic counts to determine the Cumulative Year 2042 Without Project traffic volumes for use in the TIS analysis.

✓ Cumulative Year 2042 Plus Project

VRPA will identify Cumulative Year 2042 Plus Project traffic considering the Cumulative Year 2042 Without Project peak hour volumes and the Projects trip generation as discussed later in this document.

Tachi Palace Hotel & Casino Expansion Project **Figure 1**
Project Location



PROPOSED STUDY AREA

The proposed study intersections and street and highway segments to be evaluated in the traffic study are listed below.

Intersections

- ✓ Jackson Avenue at 16th Avenue
- ✓ Jersey Avenue at SR 41 (20th Avenue)
- ✓ Jersey Avenue at 18th Avenue
- ✓ Jersey Avenue at Main Tachi Palace Hotel & Casino Driveway
- ✓ Jersey Avenue at 17th Avenue
- ✓ Jersey Avenue at 16th Avenue

Street Segments

- ✓ 16th Avenue between:
  - Jackson Avenue and Jersey Avenue

- ✓ Jersey Avenue between:
  - SR 41 and 18th Avenue
  - 18th Avenue and 17th Avenue
  - 17th Avenue and 16th Avenue

TRIP GENERATION METHODOLOGY

Casino / Hotel Trips

As noted previously, the Project proposes to include level of service (LOS) analysis for a Friday and/or Saturday peak hour which will be determined by existing Friday/Saturday 24-hour counts at the existing Project Driveways. Appropriate peak hour counts (Friday/Saturday) at the existing Tachi Palace Hotel & Casino will be used to assist in determining the trip generation for the proposed Project. The Institute of Transportation Engineer's (ITE) Trip Generation Manual includes a Casino/Video Lottery Establishment land use. However, the description of that land use isn't comparable to the existing Tachi Palace Hotel & Casino or the proposed Project. Standard rates for Indian gaming casinos are not available in the latest edition of the ITE Trip General Manual.

Casino trip generation rates commonly include patrons to the slot machines and table games, as well as ancillary uses such as restaurants, meeting spaces, back-of-house, employees arriving and departing on a shift change, and all of the general activities occurring at the facility during the peak hours. As such, separate calculations for the non-casino functions are typically not necessary. This is particularly true for hotel-casino-event facilities in rural locations, where patrons engage in relatively few "in-and-out" trips after arriving at the facility (as compared to standard hotels for which stand-alone trip generation rates are used).

The existing Tachi-Palace Casino includes an attached hotel with 200 rooms, event space, and meeting space. As a result, peak hour counts at the existing driveways will capture employees and patrons of the casino, hotel, on-site restaurants, bars, and other ancillary facilities. These counts will be used to estimate the trip generation for the expansion of the casino, meeting space, additional 300 hotel rooms, and other ancillary facilities.

Special Event Venue

The existing Tachi Palace Hotel & Casino includes a 1,230 seat event/entertainment center. The Project proposes to include a new event/entertainment center space with a seating capacity of 2,500. A separate specific trip generation for the new event center will developed and added to the estimated trip generation for the proposed casino if existing counts at the driveway are not conducted during an event at the Project site. It is anticipated that the presence of the casino/hotel will generate different arrival and departure characteristics than a stand-alone special event venue. It is recommended that the following scenario be analyzed to represent special event traffic:

- Special Event Venue weekday evening event at full capacity
- Typical weekday evening activity for all other uses

In order to analyze this scenario, the following assumptions will be made:

- It is considered important to analyze both inbound traffic conditions prior to the special event and outbound traffic conditions after the event
- Information from the *2009 National Household Travel Survey Average Vehicle Occupancy Rate for Social and Recreational Purposes* will be used to estimate trips associated with the special event venue. This survey showed a total combined vehicle occupancy of 2.21 persons per vehicle for recreational purposes, which is equivalent to a trip generation rate of 0.45 trips per seat.
- It will be conservatively assumed that 50% of special event attendees will be captured by the casino. Data provided in a traffic study for a similar project in a rural county area in northern California shows that just 30% of special event attendees are 'new' patrons[1].
- Trip generation for the remainder of the Project will be assumed to be the same as the typical weekday peak hour as determined by the traffic counts conducted at the existing facility.
- Although hours could vary, for traffic analysis purposes it will be assumed that the inbound peak hour would occur from 6 PM to 7PM and the outbound peak hour would occur from 8 PM to 9 PM. While typical events would be expected to last more than an hour, the time period for the outbound peak hour is considered to be a conservative assumption since prevailing traffic on local roadways would tend to decrease at later hours in the evening.

1 Kimley Horn, 2016. Traffic Impact Study for the Cache Creek Hotel Expansion Project. Dated July 2016. Available at http://www.cachecreekteir.com/wp-content/uploads/2016/09/Cache-Creek-Hotel-Expansion-TEIR-Vol-2.pdf.

- Trips associated with the existing special event venue will be manually added to existing traffic counts to accurately depict current operations at the existing facility. Special event venue trips from the existing facility will be determined by the assumptions noted above.

- Trips associated with the New Event space will be included in the trip generation for the proposed expansion project.

Gas Station Improvements

Improvements to the existing gas station located at the southwest corner of Jersey Avenue and 17th Avenue include the addition of a retail store, drive-thru carwash, and additional fuel dispensers at the current fuel station on site (both semi-truck dispensers, and conventional fuel dispensers). Project trips associated with the gas station improvements will be determined using trip generation rates from the ITE Trip Generation Manual (10th Edition). Trips will be derived from the Convenience Market with Gasoline Pumps (853) Land Use in the ITE Trip Generation Manual.

TRIP DISTRIBUTION

Project trip distribution will be based upon engineering judgement, prevailing traffic patterns in the study area, complementary land uses, major routes, population centers, and a review of data available in the KCAG travel demand model.

INTERSECTION AND SEGMENT ANALYSIS

Intersections

All intersection LOS analyses will be estimated using Synchro 10 Software for the peak hours. The following inputs and parameters will be applied in order to accurately determine the travel delay and LOS for each study intersection:

- ✓ VRPA will conduct a field study of the specified intersections and segments to verify lane geometry and intersection control
- ✓ Peak hour factors (PHF) for each intersection approach will be obtained from existing traffic counts and utilized for Existing Conditions, Existing Plus Project, and Near-term (Opening Year 2022) Plus Project Conditions. For all future scenarios, a PHF of 0.92 will be applied
- ✓ Existing left- and right-turn storage pockets will be measured in the field and rounded to the nearest 25 feet
- ✓ Roadway link speed limits will be observed in the field and input into the Synchro network to determine roadway link speeds
- ✓ Heavy vehicle percentages will be applied based on the HCM default (3%). Heavy vehicle percentages along SR 41 will be based upon Caltrans traffic count data
- ✓ HCM 6th Edition outputs for delay and level of service will be utilized

- ✓ Queuing conditions for left and right-turn lanes at all study intersections will be conducted initially using the 95th percentile queue results from the Synchro software. The 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes queuing. Adjustments may be needed in cases where it can be concluded that the Synchro results are overly conservative.
- ✓ CA MUTCD Traffic Signal Warrant 3 will be used to determine the need for a traffic signal at study intersections

Segment Analysis

All segment LOS analyses will be estimated using the HCS software program which incorporates HCM 6th Edition methodologies.

If you have any questions or require further information, please contact me at (559) 271-1200 extension 2.

Sincerely,



Mr. Jason Ellard
Transportation Engineer

APPENDIX B

Traffic Count Data Worksheets

National Data & Surveying Services

Intersection Turning Movement Count

Location: 16th Ave & Jackson Ave
City: Lemoore
Control: 4-Way Stop

Project ID: 20-07068-001
Date: 2/21/2020

Total

NS/EW Streets:	16th Ave				16th Ave				Jackson Ave				Jackson Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	0	12	2	0	0	7	4	0	3	8	0	0	10	8	0	0	54
5:15 PM	0	10	4	0	0	5	3	0	4	12	0	0	2	7	0	0	47
5:30 PM	0	15	2	0	0	5	1	0	4	6	1	0	3	8	0	0	45
5:45 PM	0	11	0	0	0	11	2	0	5	6	0	0	4	10	0	0	49
6:00 PM	0	7	2	0	0	6	4	0	2	9	0	0	4	10	0	0	44
6:15 PM	1	7	2	0	0	13	2	0	1	4	0	0	1	3	1	0	35
6:30 PM	0	11	1	0	0	6	1	0	4	3	0	0	5	5	0	0	36
6:45 PM	0	12	0	0	0	9	3	0	1	4	0	0	2	3	0	0	34
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	85	13	0	0	62	20	0	24	52	1	0	31	54	1	0	344
APPROACH %'s :	1.01%	85.86%	13.13%	0.00%	0.00%	75.61%	24.39%	0.00%	31.17%	67.53%	1.30%	0.00%	36.05%	62.79%	1.16%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	48	8	0	0	28	10	0	16	32	1	0	19	33	0	0	195
PEAK HR FACTOR :	0.000	0.800	0.500	0.000	0.000	0.636	0.625	0.000	0.800	0.667	0.250	0.000	0.475	0.825	0.000	0.000	0.903
	0.824				0.731				0.766				0.722				

National Data & Surveying Services

Intersection Turning Movement Count

Location: SR 41/20th Ave & Jersey Ave
City: Lemoore
Control: 2-Way Stop (EB/WB)

Project ID: 20-07068-002
Date: 2/21/2020

Total

NS/EW Streets:	SR 41/20th Ave				SR 41/20th Ave				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	0.5	0.5	0	0	0.5	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	0	127	6	0	12	104	0	0	2	0	1	0	6	0	16	0	274
5:15 PM	1	82	5	0	10	107	1	0	1	1	0	0	1	3	2	0	214
5:30 PM	0	121	5	0	10	78	0	0	0	1	0	0	6	1	14	0	236
5:45 PM	0	95	10	0	9	70	0	0	0	1	0	0	5	1	12	0	203
6:00 PM	0	89	2	0	16	83	0	0	0	2	0	0	0	0	5	0	197
6:15 PM	0	96	6	1	15	78	0	0	0	1	1	0	3	0	16	0	217
6:30 PM	0	69	4	0	14	74	0	0	0	0	0	0	2	1	15	0	179
6:45 PM	1	59	10	0	9	70	0	0	0	1	0	0	3	0	10	0	163
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	2	738	48	1	95	664	1	0	3	7	2	0	26	6	90	0	1683
APPROACH %'s :	0.25%	93.54%	6.08%	0.13%	12.50%	87.37%	0.13%	0.00%	25.00%	58.33%	16.67%	0.00%	21.31%	4.92%	73.77%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	1	425	26	0	41	359	1	0	3	3	1	0	18	5	44	0	927
PEAK HR FACTOR :	0.250	0.837	0.650	0.000	0.854	0.839	0.250	0.000	0.375	0.750	0.250	0.000	0.750	0.417	0.688	0.000	0.846
	0.850				0.850				0.583				0.761				

National Data & Surveying Services

Intersection Turning Movement Count

Location: 18th Ave & Jersey Ave
City: Lemoore
Control: 4-Way Stop

Project ID: 20-07068-003
Date: 2/21/2020

Total

NS/EW Streets:	18th Ave				18th Ave				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	1	1	1	0	1	1	0	0	1	0.5	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	2	13	3	0	49	9	1	0	1	22	0	0	3	24	15	0	142
5:15 PM	0	11	6	0	47	11	4	0	1	23	0	0	4	10	22	0	139
5:30 PM	0	15	3	0	63	15	3	0	2	22	1	0	0	16	21	0	161
5:45 PM	0	7	1	0	50	9	1	0	2	22	0	0	2	19	21	0	134
6:00 PM	1	15	3	0	47	5	1	0	1	25	0	0	2	15	22	0	137
6:15 PM	0	8	0	0	55	10	0	0	0	28	0	0	1	22	19	0	143
6:30 PM	0	10	4	0	48	5	1	0	1	17	1	0	0	18	21	0	126
6:45 PM	0	6	5	0	61	14	2	0	0	26	0	0	2	20	27	0	163
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	85	25	0	420	78	13	0	8	185	2	0	14	144	168	0	1145
APPROACH %'s :	2.65%	75.22%	22.12%	0.00%	82.19%	15.26%	2.54%	0.00%	4.10%	94.87%	1.03%	0.00%	4.29%	44.17%	51.53%	0.00%	
PEAK HR :	05:00 pm - 06:00 pm																TOTAL
PEAK HR VOL :	2	46	13	0	209	44	9	0	6	89	1	0	9	69	79	0	576
PEAK HR FACTOR :	0.250	0.767	0.542	0.000	0.829	0.733	0.563	0.000	0.750	0.967	0.250	0.000	0.563	0.719	0.898	0.000	0.894
	0.847				0.809				0.960				0.935				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Main Tachi Palace Hotel/Casino Dwy & Jersey Ave
City: Lemoore
Control: 1-Way Stop (NB)

Project ID: 20-07068-004
Date: 2/21/2020

Total

NS/EW Streets:	Main Tachi Palace Hotel/Casino Dwy				Main Tachi Palace Hotel/Casino Dwy				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	1	0	0	0	0	0	0	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	17	0	6	0	0	0	0	0	0	30	47	0	13	27	0	0	140
5:15 PM	12	0	9	0	0	0	0	0	0	29	46	0	10	19	0	0	125
5:30 PM	19	0	16	0	0	0	0	0	0	34	53	0	10	23	0	0	155
5:45 PM	12	0	11	0	0	0	0	0	0	36	39	0	11	33	0	0	142
6:00 PM	19	0	5	0	0	0	0	0	0	27	48	0	15	18	0	0	132
6:15 PM	29	0	12	0	0	0	0	0	0	31	47	0	11	15	0	0	145
6:30 PM	18	0	9	0	0	0	0	0	0	31	42	0	9	16	0	0	125
6:45 PM	15	0	9	0	0	0	0	0	0	30	57	0	7	33	0	0	151
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	141	0	77	0	0	0	0	0	0	248	379	0	86	184	0	0	1115
APPROACH %'s :	64.68%	0.00%	35.32%	0.00%					0.00%	39.55%	60.45%	0.00%	31.85%	68.15%	0.00%	0.00%	
PEAK HR :	05:30 PM - 06:30 PM																TOTAL
PEAK HR VOL :	79	0	44	0	0	0	0	0	0	128	187	0	47	89	0	0	574
PEAK HR FACTOR :	0.681	0.000	0.688	0.000	0.000	0.000	0.000	0.000	0.000	0.889	0.882	0.000	0.783	0.674	0.000	0.000	0.926
	0.750								0.905				0.773				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Coyote Entertainment Center Dwy & Jersey Ave
City: Lemoore
Control: 1-Way Stop (NB)

Project ID: 20-07068-007
Date: 2/21/2020

Total

NS/EW Streets:	Coyote Entertainment Center Dwy				Coyote Entertainment Center Dwy				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	10	0	8	0	0	0	0	0	0	27	9	0	7	30	0	0	91
5:15 PM	4	0	3	0	0	0	0	0	0	33	5	0	8	25	0	0	78
5:30 PM	6	0	11	0	0	0	0	0	0	38	12	0	9	27	0	0	103
5:45 PM	8	0	4	0	0	0	0	0	0	32	14	0	15	36	0	0	109
6:00 PM	4	0	6	0	0	0	0	0	0	23	10	0	9	29	0	0	81
6:15 PM	2	0	9	0	0	0	0	0	0	33	10	0	12	24	0	0	90
6:30 PM	5	0	3	0	0	0	0	0	0	27	13	0	6	21	0	0	75
6:45 PM	11	0	9	0	0	0	0	0	0	29	10	0	11	28	0	0	98
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	50	0	53	0	0	0	0	0	0	242	83	0	77	220	0	0	725
APPROACH %'s :	48.54%	0.00%	51.46%	0.00%					0.00%	74.46%	25.54%	0.00%	25.93%	74.07%	0.00%	0.00%	
PEAK HR :	05:30 PM - 06:30 PM																TOTAL
PEAK HR VOL :	20	0	30	0	0	0	0	0	0	126	46	0	45	116	0	0	383
PEAK HR FACTOR :	0.625	0.000	0.682	0.000	0.000	0.000	0.000	0.000	0.000	0.829	0.821	0.000	0.750	0.806	0.000	0.000	0.878
	0.735								0.860				0.789				

National Data & Surveying Services

Intersection Turning Movement Count

Location: 17th Ave & Jersey Ave
City: Lemoore
Control: 4-Way Stop

Project ID: 20-07068-005
Date: 2/21/2020

Total

NS/EW Streets:	17th Ave				17th Ave				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	1	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	7	18	17	0	3	10	9	0	7	13	6	0	16	15	1	0	122
5:15 PM	12	17	19	0	3	10	9	0	6	11	4	0	14	14	9	0	128
5:30 PM	8	15	10	0	0	14	4	0	12	27	2	0	11	17	3	0	123
5:45 PM	12	13	11	0	1	19	10	0	7	6	7	0	10	22	3	0	121
6:00 PM	10	18	10	0	3	17	10	0	4	8	8	0	10	19	5	0	122
6:15 PM	6	16	7	0	0	15	2	0	4	17	7	0	16	17	1	0	108
6:30 PM	2	22	9	0	4	15	9	0	8	6	6	0	10	12	2	0	105
6:45 PM	12	15	10	0	4	11	4	0	8	9	7	0	10	17	2	0	109
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	69	134	93	0	18	111	57	0	56	97	47	0	97	133	26	0	938
APPROACH %'s :	23.31%	45.27%	31.42%	0.00%	9.68%	59.68%	30.65%	0.00%	28.00%	48.50%	23.50%	0.00%	37.89%	51.95%	10.16%	0.00%	
PEAK HR :	05:00 pm - 06:00 pm																TOTAL
PEAK HR VOL :	39	63	57	0	7	53	32	0	32	57	19	0	51	68	16	0	494
PEAK HR FACTOR :	0.813	0.875	0.750	0.000	0.583	0.697	0.800	0.000	0.667	0.528	0.679	0.000	0.797	0.773	0.444	0.000	0.965
	0.828				0.767				0.659				0.912				

National Data & Surveying Services

Intersection Turning Movement Count

Location: 16th Ave & Jersey Ave
City: Lemoore
Control: 2-Way Stop (EB/WB)

Project ID: 20-07068-006
Date: 2/21/2020

Total

NS/EW Streets:	16th Ave				16th Ave				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	2	0	0	0	0	0	18	0	17	21	0	0	0	15	0	0	73
5:15 PM	3	2	0	0	0	1	3	0	2	2	0	0	0	3	0	0	16
5:30 PM	0	1	0	0	0	0	10	0	21	18	0	0	0	20	0	0	70
5:45 PM	0	0	1	0	0	0	13	0	8	9	2	0	0	18	0	0	51
6:00 PM	1	0	0	0	0	0	11	0	11	5	1	0	0	14	0	0	43
6:15 PM	0	0	0	0	0	0	12	0	12	9	0	0	0	16	0	0	49
6:30 PM	0	0	0	0	0	0	12	0	9	8	0	0	0	9	1	0	39
6:45 PM	0	0	0	0	0	0	11	0	11	6	0	0	0	13	0	0	41
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	6	3	1	0	0	1	90	0	91	78	3	0	0	108	1	0	382
APPROACH %'s :	60.00%	30.00%	10.00%	0.00%	0.00%	1.10%	98.90%	0.00%	52.91%	45.35%	1.74%	0.00%	0.00%	99.08%	0.92%	0.00%	
PEAK HR :	05:30 PM - 06:30 PM																TOTAL
PEAK HR VOL :	1	1	1	0	0	0	46	0	52	41	3	0	0	68	0	0	213
PEAK HR FACTOR :	0.250	0.250	0.250	0.000	0.000	0.000	0.885	0.000	0.619	0.569	0.375	0.000	0.000	0.850	0.000	0.000	0.761
	0.750				0.885				0.615				0.850				

National Data & Surveying Services

Intersection Turning Movement Count

Location: 17th Ave & Additional Guest Parking Dwy
City: Lemoore
Control: 1-Way Stop (EB)

Project ID: 20-07068-008
Date: 2/21/2020

Total

NS/EW Streets:	17th Ave				17th Ave				Additional Guest Parking Dwy				Additional Guest Parking Dwy				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	14	12	0	0	0	18	16	0	23	0	3	0	0	0	0	0	86
5:15 PM	31	24	0	0	0	14	13	0	19	0	5	0	0	0	0	0	106
5:30 PM	21	13	0	0	0	11	12	0	20	0	8	0	0	0	0	0	85
5:45 PM	21	14	0	0	0	13	22	0	15	0	11	0	0	0	0	0	96
6:00 PM	17	11	0	0	0	11	19	0	13	0	4	0	0	0	0	0	75
6:15 PM	21	10	0	0	0	14	22	0	18	0	5	0	0	0	0	0	90
6:30 PM	10	16	0	0	0	11	14	0	18	0	3	0	0	0	0	0	72
6:45 PM	15	15	0	0	0	12	15	0	17	0	4	0	0	0	0	0	78
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	150	115	0	0	0	104	133	0	143	0	43	0	0	0	0	0	688
APPROACH %'s :	56.60%	43.40%	0.00%	0.00%	0.00%	43.88%	56.12%	0.00%	76.88%	0.00%	23.12%	0.00%					
PEAK HR :	05:00 pm - 06:00 pm																TOTAL
PEAK HR VOL :	87	63	0	0	0	56	63	0	77	0	27	0	0	0	0	0	373
PEAK HR FACTOR :	0.702	0.656	0.000	0.000	0.000	0.778	0.716	0.000	0.837	0.000	0.614	0.000	0.000	0.000	0.000	0.000	0.880
	0.682				0.850				0.929								

National Data & Surveying Services

Intersection Turning Movement Count

Location: 16th Ave & Jackson Ave
City: Lemoore
Control: 4-Way Stop

Project ID: 20-07068-001
Date: 2/22/2020

Total

NS/EW Streets:	16th Ave				16th Ave				Jackson Ave				Jackson Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	1 NT	0 NR	0 NU	0 SL	1 ST	0 SR	0 SU	0 EL	1 ET	0 ER	0 EU	0 WL	1 WT	0 WR	0 WU	TOTAL
5:00 PM	0	16	1	0	0	14	1	0	5	1	0	0	2	7	2	0	49
5:15 PM	0	15	2	0	2	8	2	0	2	7	0	0	3	5	0	0	46
5:30 PM	0	10	0	0	0	5	3	0	2	4	0	0	0	7	0	0	31
5:45 PM	0	6	2	0	0	12	1	0	4	3	0	0	1	5	0	0	34
6:00 PM	0	19	0	0	0	14	3	0	6	5	1	0	3	3	0	0	54
6:15 PM	0	15	0	0	1	6	4	0	0	6	0	0	4	4	0	0	40
6:30 PM	0	9	1	0	0	9	0	0	6	4	0	0	3	5	0	0	37
6:45 PM	0	12	1	0	0	7	1	0	8	8	0	0	6	8	0	0	51
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	102	7	0	3	75	15	0	33	38	1	0	22	44	2	0	342
APPROACH %'s :	0.00%	93.58%	6.42%	0.00%	3.23%	80.65%	16.13%	0.00%	45.83%	52.78%	1.39%	0.00%	32.35%	64.71%	2.94%	0.00%	
PEAK HR :	06:00 pm - 07:00 pm																TOTAL
PEAK HR VOL :	0	55	2	0	1	36	8	0	20	23	1	0	16	20	0	0	182
PEAK HR FACTOR :	0.000	0.724	0.500	0.000	0.250	0.643	0.500	0.000	0.625	0.719	0.250	0.000	0.667	0.625	0.000	0.000	0.843
	0.750				0.662				0.688				0.643				

National Data & Surveying Services

Intersection Turning Movement Count

Location: SR 41/20th Ave & Jersey Ave
City: Lemoore
Control: 2-Way Stop (EB/WB)

Project ID: 20-07068-002
Date: 2/22/2020

Total

NS/EW Streets:	SR 41/20th Ave				SR 41/20th Ave				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	0.5	0.5	0	0	0.5	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	0	61	4	0	19	48	0	0	0	0	0	0	10	3	8	0	153
5:15 PM	0	62	6	0	21	39	0	0	0	0	0	0	8	0	14	0	150
5:30 PM	0	80	9	0	22	51	0	0	0	1	0	0	5	4	8	0	180
5:45 PM	1	50	6	0	23	47	0	0	0	1	0	0	7	0	15	0	150
6:00 PM	0	85	9	0	15	44	0	0	0	2	0	0	6	2	7	0	170
6:15 PM	0	78	12	0	14	41	0	0	0	1	0	0	4	0	12	0	162
6:30 PM	0	82	10	0	19	35	0	0	0	0	0	0	8	1	8	0	163
6:45 PM	0	57	10	0	17	43	0	0	0	2	0	0	5	1	10	0	145
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	555	66	0	150	348	0	0	0	7	0	0	53	11	82	0	1273
APPROACH %'s :	0.16%	89.23%	10.61%	0.00%	30.12%	69.88%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	36.30%	7.53%	56.16%	0.00%	
PEAK HR :	05:30 pm - 06:30 pm																TOTAL
PEAK HR VOL :	1	293	36	0	74	183	0	0	0	5	0	0	22	6	42	0	662
PEAK HR FACTOR :	0.250	0.862	0.750	0.000	0.804	0.897	0.000	0.000	0.000	0.625	0.000	0.000	0.786	0.375	0.700	0.000	0.919
	0.878				0.880				0.625				0.795				

National Data & Surveying Services

Intersection Turning Movement Count

Location: 18th Ave & Jersey Ave
City: Lemoore
Control: 4-Way Stop

Project ID: 20-07068-003
Date: 2/22/2020

Total

NS/EW Streets:	18th Ave				18th Ave				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	1	1	1	0	1	1	0	0	1	0.5	0.5	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	1	6	5	0	61	10	1	0	2	26	0	0	5	23	30	0	170
5:15 PM	0	5	4	0	60	4	1	0	0	35	0	0	3	28	32	0	172
5:30 PM	1	11	3	0	63	9	1	0	1	37	1	0	0	18	37	0	182
5:45 PM	0	7	1	0	52	3	0	0	0	37	0	0	1	20	31	0	152
6:00 PM	0	4	4	0	53	3	1	0	0	33	1	0	3	18	24	0	144
6:15 PM	0	6	7	0	48	5	1	0	1	23	0	0	0	23	25	0	139
6:30 PM	1	3	1	0	50	4	1	0	0	33	0	0	2	17	44	0	156
6:45 PM	0	3	3	0	57	6	1	0	1	39	0	0	1	19	29	0	159
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	45	28	0	444	44	7	0	5	263	2	0	15	166	252	0	1274
APPROACH %'s :	3.95%	59.21%	36.84%	0.00%	89.70%	8.89%	1.41%	0.00%	1.85%	97.41%	0.74%	0.00%	3.46%	38.34%	58.20%	0.00%	
PEAK HR :	05:00 pm - 06:00 pm																TOTAL
PEAK HR VOL :	2	29	13	0	236	26	3	0	3	135	1	0	9	89	130	0	676
PEAK HR FACTOR :	0.500	0.659	0.650	0.000	0.937	0.650	0.750	0.000	0.375	0.912	0.250	0.000	0.450	0.795	0.878	0.000	0.929
	0.733				0.908				0.891				0.905				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Main Tachi Palace Hotel/Casino Dwy & Jersey Ave
City: Lemoore
Control: 1-Way Stop (NB)

Project ID: 20-07068-004
Date: 2/22/2020

Total

NS/EW Streets:	Main Tachi Palace Hotel/Casino Dwy				Main Tachi Palace Hotel/Casino Dwy				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	1	0	0	0	0	0	0	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	26	0	9	0	0	0	0	0	0	35	61	0	10	31	0	0	172
5:15 PM	36	0	14	0	0	0	0	0	0	40	56	0	13	29	0	0	188
5:30 PM	30	0	17	0	0	0	0	0	0	36	65	0	12	23	0	0	183
5:45 PM	25	0	17	0	0	0	0	0	0	29	64	0	10	29	0	0	174
6:00 PM	24	0	15	0	0	0	0	0	0	33	57	0	14	20	0	0	163
6:15 PM	28	0	16	0	0	0	0	0	0	37	38	0	19	24	0	0	162
6:30 PM	25	0	17	0	0	0	0	0	0	33	55	0	4	34	0	0	168
6:45 PM	17	0	11	0	0	0	0	0	0	35	60	0	10	32	0	0	165
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	211	0	116	0	0	0	0	0	0	278	456	0	92	222	0	0	1375
APPROACH %'s :	64.53%	0.00%	35.47%	0.00%					0.00%	37.87%	62.13%	0.00%	29.30%	70.70%	0.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	117	0	57	0	0	0	0	0	0	140	246	0	45	112	0	0	717
PEAK HR FACTOR :	0.813	0.000	0.838	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.946	0.000	0.865	0.903	0.000	0.000	0.953
	0.870								0.955				0.935				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Coyote Entertainment Center Dwy & Jersey Ave
City: Lemoore
Control: 1-Way Stop (NB)

Project ID: 20-07068-007
Date: 2/22/2020

Total

NS/EW Streets:	Coyote Entertainment Center Dwy				Coyote Entertainment Center Dwy				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	14	0	11	0	0	0	0	0	0	27	17	0	18	29	0	0	116
5:15 PM	7	0	7	0	0	0	0	0	0	34	17	0	6	33	0	0	104
5:30 PM	11	0	6	0	0	0	0	0	0	42	13	0	7	24	0	0	103
5:45 PM	4	0	11	0	0	0	0	0	0	36	9	0	8	35	0	0	103
6:00 PM	9	0	14	0	0	0	0	0	0	36	14	0	10	26	0	0	109
6:15 PM	11	0	13	0	0	0	0	0	0	40	13	0	9	31	0	0	117
6:30 PM	9	0	9	0	0	0	0	0	0	36	13	0	8	30	0	0	105
6:45 PM	17	0	10	0	0	0	0	0	0	32	15	0	13	24	0	0	111
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	82	0	81	0	0	0	0	0	0	283	111	0	79	232	0	0	868
APPROACH %'s :	50.31%	0.00%	49.69%	0.00%					0.00%	71.83%	28.17%	0.00%	25.40%	74.60%	0.00%	0.00%	
PEAK HR :	06:00 pm - 07:00 pm																TOTAL
PEAK HR VOL :	46	0	46	0	0	0	0	0	0	144	55	0	40	111	0	0	442
PEAK HR FACTOR :	0.676	0.000	0.821	0.000	0.000	0.000	0.000	0.000	0.000	0.900	0.917	0.000	0.769	0.895	0.000	0.000	0.944
	0.852								0.939				0.944				

National Data & Surveying Services

Intersection Turning Movement Count

Location: 17th Ave & Jersey Ave
City: Lemoore
Control: 4-Way Stop

Project ID: 20-07068-005
Date: 2/22/2020

Total

NS/EW Streets:	17th Ave				17th Ave				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	1	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	13	20	13	0	2	10	6	0	3	15	8	0	8	20	2	0	120
5:15 PM	9	16	11	0	3	16	5	0	5	16	10	0	17	18	0	0	126
5:30 PM	4	14	8	0	3	16	5	0	6	17	10	0	9	14	1	0	107
5:45 PM	13	13	8	0	4	19	3	0	12	17	5	0	15	20	3	0	132
6:00 PM	12	15	21	0	1	12	2	0	5	21	15	0	12	20	2	0	138
6:15 PM	12	15	11	0	2	16	5	1	2	20	12	0	8	16	6	0	126
6:30 PM	10	22	7	0	4	15	1	0	9	18	9	0	12	19	1	0	127
6:45 PM	8	24	11	0	2	5	6	0	9	18	6	0	12	15	2	0	118
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	81	139	90	0	21	109	33	1	51	142	75	0	93	142	17	0	994
APPROACH %'s :	26.13%	44.84%	29.03%	0.00%	12.80%	66.46%	20.12%	0.61%	19.03%	52.99%	27.99%	0.00%	36.90%	56.35%	6.75%	0.00%	
PEAK HR :	05:45 pm - 06:45 pm																TOTAL
PEAK HR VOL :	47	65	47	0	11	62	11	1	28	76	41	0	47	75	12	0	523
PEAK HR FACTOR :	0.904	0.739	0.560	0.000	0.688	0.816	0.550	0.250	0.583	0.905	0.683	0.000	0.783	0.938	0.500	0.000	0.947
	0.828				0.817				0.884				0.882				

National Data & Surveying Services

Intersection Turning Movement Count

Location: 16th Ave & Jersey Ave
City: Lemoore
Control: 2-Way Stop (EB/WB)

Project ID: 20-07068-006
Date: 2/22/2020

Total

NS/EW Streets:	16th Ave				16th Ave				Jersey Ave				Jersey Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	1 NT	0 NR	0 NU	0 SL	1 ST	0 SR	0 SU	0 EL	1 ET	0 ER	0 EU	0 WL	1 WT	0 WR	0 WU	TOTAL
5:00 PM	0	0	0	0	0	1	14	0	17	12	0	0	0	12	0	0	56
5:15 PM	0	0	0	0	0	0	12	0	18	10	0	0	0	11	0	0	51
5:30 PM	0	0	0	0	0	1	5	0	11	16	0	0	0	13	0	0	46
5:45 PM	0	0	0	0	0	0	11	0	10	7	0	0	0	14	0	0	42
6:00 PM	2	0	0	0	1	1	18	0	18	13	0	0	0	10	0	0	63
6:15 PM	0	0	0	0	0	0	10	0	13	8	0	0	0	7	0	0	38
6:30 PM	1	0	0	0	0	0	13	0	10	11	0	0	0	14	0	0	49
6:45 PM	0	0	0	0	0	0	12	0	13	7	0	0	0	14	0	0	46
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	0	0	0	1	3	95	0	110	84	0	0	0	95	0	0	391
APPROACH %'s :	100.00%	0.00%	0.00%	0.00%	1.01%	3.03%	95.96%	0.00%	56.70%	43.30%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	05:15 pm - 06:15 pm																TOTAL
PEAK HR VOL :	2	0	0	0	1	2	46	0	57	46	0	0	0	48	0	0	202
PEAK HR FACTOR :	0.250	0.000	0.000	0.000	0.250	0.500	0.639	0.000	0.792	0.719	0.000	0.000	0.000	0.857	0.000	0.000	0.802
	0.250				0.613				0.831				0.857				

National Data & Surveying Services

Intersection Turning Movement Count

Location: 17th Ave & Additional Guest Parking Dwy
City: Lemoore
Control: 1-Way Stop (EB)

Project ID: 20-07068-008
Date: 2/22/2020

Total

NS/EW Streets:	17th Ave				17th Ave				Additional Guest Parking Dwy				Additional Guest Parking Dwy				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
5:00 PM	34	18	0	0	0	12	19	0	26	0	17	0	0	0	0	0	126
5:15 PM	23	10	0	0	0	13	30	0	18	0	13	0	0	0	0	0	107
5:30 PM	33	14	0	0	0	15	25	0	16	0	23	0	0	0	0	0	126
5:45 PM	22	18	0	0	0	12	21	0	12	0	7	0	0	0	0	0	92
6:00 PM	22	22	0	0	0	14	25	0	27	0	10	0	0	0	0	0	120
6:15 PM	19	21	0	0	0	10	26	0	13	0	15	0	0	0	0	0	104
6:30 PM	13	23	0	0	0	10	21	0	26	0	10	0	0	0	0	0	103
6:45 PM	22	16	0	0	0	17	8	0	22	0	10	0	0	0	0	0	95
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	188	142	0	0	0	103	175	0	160	0	105	0	0	0	0	0	873
APPROACH %'s :	56.97%	43.03%	0.00%	0.00%	0.00%	37.05%	62.95%	0.00%	60.38%	0.00%	39.62%	0.00%					
PEAK HR :	05:00 pm - 06:00 pm																TOTAL
PEAK HR VOL :	112	60	0	0	0	52	95	0	72	0	60	0	0	0	0	0	451
PEAK HR FACTOR :	0.824	0.833	0.000	0.000	0.000	0.867	0.792	0.000	0.692	0.000	0.652	0.000	0.000	0.000	0.000	0.000	0.895
	0.827				0.855				0.767								

Prepared by National Data & Surveying Services

VOLUME

Jersey Ave Bet. 18th Ave & Main Tachi Palace Hotel/Casino Dwy

Day: Friday
Date: 2/21/2020

City: Lemoore
Project #: CA20_7067_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,945	3,273	7,218

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			21		33		54		12:00			45		36		81	
00:15			10		27		37		12:15			43		27		70	
00:30			14		28		42		12:30			49		40		89	
00:45			14	59	32	120	46	179	12:45			57	194	41	144	98	338
01:00			13		28		41		13:00			37		37		74	
01:15			11		24		35		13:15			61		40		101	
01:30			11		26		37		13:30			63		44		107	
01:45			6	41	19	97	25	138	13:45			44	205	43	164	87	369
02:00			9		19		28		14:00			45		49		94	
02:15			10		14		24		14:15			54		36		90	
02:30			12		23		35		14:30			46		44		90	
02:45			5	36	9	65	14	101	14:45			60	205	43	172	103	377
03:00			6		12		18		15:00			48		51		99	
03:15			5		12		17		15:15			55		48		103	
03:30			6		12		18		15:30			54		41		95	
03:45			2	19	18	54	20	73	15:45			79	236	37	177	116	413
04:00			6		10		16		16:00			65		50		115	
04:15			8		16		24		16:15			77		52		129	
04:30			5		14		19		16:30			77		41		118	
04:45			10	29	13	53	23	82	16:45			80	299	58	201	138	500
05:00			16		11		27		17:00			75		47		122	
05:15			18		13		31		17:15			81		32		113	
05:30			6		12		18		17:30			88		40		128	
05:45			12	52	20	56	32	108	17:45			73	317	45	164	118	481
06:00			8		13		21		18:00			74		37		111	
06:15			19		11		30		18:15			83		48		131	
06:30			15		15		30		18:30			71		35		106	
06:45			20	62	29	68	49	130	18:45			92	320	47	167	139	487
07:00			21		17		38		19:00			102		45		147	
07:15			18		17		35		19:15			81		43		124	
07:30			27		47		74		19:30			82		43		125	
07:45			34	100	62	143	96	243	19:45			84	349	50	181	134	530
08:00			42		20		62		20:00			73		34		107	
08:15			24		15		39		20:15			67		50		117	
08:30			28		22		50		20:30			87		34		121	
08:45			28	122	20	77	48	199	20:45			54	281	39	157	93	438
09:00			26		26		52		21:00			58		58		116	
09:15			24		24		48		21:15			65		59		124	
09:30			36		21		57		21:30			49		67		116	
09:45			27	113	14	85	41	198	21:45			55	227	60	244	115	471
10:00			35		25		60		22:00			44		43		87	
10:15			35		24		59		22:15			41		55		96	
10:30			45		26		71		22:30			47		95		142	
10:45			35	150	25	100	60	250	22:45			42	174	69	262	111	436
11:00			49		24		73		23:00			51		53		104	
11:15			40		30		70		23:15			41		58		99	
11:30			55		21		76		23:30			32		63		95	
11:45			58	202	30	105	88	307	23:45			29	153	43	217	72	370
TOTALS				985		1023		**2008**	**TOTALS**				2960		2250		**5210**
SPLIT %				49.1%		50.9%		**27.8%**	**SPLIT %**				56.8%		43.2%		**72.2%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,945	3,273	7,218

AM Peak Hour			11:00	07:15	**11:45**	**PM Peak Hour**			18:45	22:30	**18:45**
AM Pk Volume			202	146	**328**	**PM Pk Volume**			357	275	**535**
Pk Hr Factor			0.871	0.589	**0.921**	**Pk Hr Factor**			0.875	0.724	**0.910**
7 - 9 Volume	0	0	222	220	**442**	**4 - 6 Volume**	0	0	616	365	**981**
7 - 9 Peak Hour			07:45	07:15	**07:30**	**4 - 6 Peak Hour**			16:45	16:00	**16:15**
7 - 9 Pk Volume	0	0	128	146	**271**	**4 - 6 Pk Volume**	0	0	324	201	**507**
Pk Hr Factor	0.000	0.000	0.762	0.589	**0.706**	**Pk Hr Factor**	0.000	0.000	0.920	0.866	**0.918**

Prepared by National Data & Surveying Services

VOLUME

Jersey Ave Bet. Coyote Entertainment Center Dwy & Yokut Gas Driveway

Day: Friday
Date: 2/21/2020

City: Lemoore
Project #: CA20_7067_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,235	2,094	4,329

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			12		13		25		12:00			26		29		55	
00:15			10		8		18		12:15			20		18		38	
00:30			17		12		29		12:30			38		35		73	
00:45			10	49	4	37	14	86	12:45			24	108	27	109	51	217
01:00			18		16		34		13:00			33		32		65	
01:15			17		11		28		13:15			40		27		67	
01:30			10		9		19		13:30			25		29		54	
01:45			14	59	5	41	19	100	13:45			31	129	36	124	67	253
02:00			14		6		20		14:00			33		35		68	
02:15			12		7		19		14:15			41		28		69	
02:30			2		7		9		14:30			28		24		52	
02:45			4	32	4	24	8	56	14:45			36	138	35	122	71	260
03:00			7		7		14		15:00			23		31		54	
03:15			6		2		8		15:15			32		30		62	
03:30			17		5		22		15:30			24		34		58	
03:45			10	40	6	20	16	60	15:45			43	122	38	133	81	255
04:00			4		2		6		16:00			37		36		73	
04:15			8		4		12		16:15			34		38		72	
04:30			8		9		17		16:30			30		28		58	
04:45			5	25	8	23	13	48	16:45			36	137	50	152	86	289
05:00			11		2		13		17:00			36		36		72	
05:15			12		7		19		17:15			32		44		76	
05:30			10		3		13		17:30			58		35		93	
05:45			7	40	17	29	24	69	17:45			29	155	53	168	82	323
06:00			10		10		20		18:00			29		44		73	
06:15			18		10		28		18:15			34		27		61	
06:30			11		16		27		18:30			29		27		56	
06:45			15	54	13	49	28	103	18:45			33	125	34	132	67	257
07:00			15		15		30		19:00			23		22		45	
07:15			13		15		28		19:15			38		29		67	
07:30			25		25		50		19:30			31		29		60	
07:45			27	80	50	105	77	185	19:45			20	112	22	102	42	214
08:00			32		18		50		20:00			27		27		54	
08:15			21		16		37		20:15			30		26		56	
08:30			11		15		26		20:30			23		32		55	
08:45			14	78	23	72	37	150	20:45			28	108	20	105	48	213
09:00			21		18		39		21:00			22		24		46	
09:15			15		21		36		21:15			35		29		64	
09:30			16		22		38		21:30			45		17		62	
09:45			12	64	14	75	26	139	21:45			33	135	26	96	59	231
10:00			17		21		38		22:00			14		23		37	
10:15			21		16		37		22:15			38		19		57	
10:30			24		26		50		22:30			42		17		59	
10:45			34	96	32	95	66	191	22:45			33	127	24	83	57	210
11:00			21		32		53		23:00			35		22		57	
11:15			26		26		52		23:15			31		10		41	
11:30			23		37		60		23:30			30		29		59	
11:45			33	103	23	118	56	221	23:45			23	119	19	80	42	199
TOTALS				720		688		**1408**	**TOTALS**				1515		1406		**2921**
SPLIT %				51.1%		48.9%		**32.5%**	**SPLIT %**				51.9%		48.1%		**67.5%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,235	2,094	4,329

AM Peak Hour				11:45		10:45		**10:45**	**PM Peak Hour**				16:45		17:15		**16:45**
AM Pk Volume				117		127		**231**	**PM Pk Volume**				162		176		**327**
Pk Hr Factor				0.770		0.858		**0.875**	**Pk Hr Factor**				0.698		0.830		**0.879**
7 - 9 Volume	0	0		158		177		**335**	**4 - 6 Volume**	0	0		292		320		**612**
7 - 9 Peak Hour				07:30		07:30		**07:30**	**4 - 6 Peak Hour**				16:45		17:00		**16:45**
7 - 9 Pk Volume	0	0		105		109		**214**	**4 - 6 Pk Volume**	0	0		162		168		**327**
Pk Hr Factor	0.000	0.000		0.820		0.545		**0.695**	**Pk Hr Factor**	0.000	0.000		0.698		0.792		**0.879**

APPENDIX C

SYNCHRO 10 (HCM 6th Edition) Worksheets

EXISTING WORKSHEETS

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	32	1	19	33	0	0	48	8	0	28	10
Future Vol, veh/h	16	32	1	19	33	0	0	48	8	0	28	10
Peak Hour Factor	0.77	0.77	0.77	0.72	0.72	0.72	0.82	0.82	0.82	0.73	0.73	0.73
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	21	42	1	26	46	0	0	59	10	0	38	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.8	7.6	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	33%	37%	0%
Vol Thru, %	86%	65%	63%	74%
Vol Right, %	14%	2%	0%	26%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	56	49	52	38
LT Vol	0	16	19	0
Through Vol	48	32	33	28
RT Vol	8	1	0	10
Lane Flow Rate	68	64	72	52
Geometry Grp	1	1	1	1
Degree of Util (X)	0.079	0.075	0.086	0.059
Departure Headway (Hd)	4.141	4.269	4.282	4.082
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	852	829	827	863
Service Time	2.23	2.349	2.359	2.176
HCM Lane V/C Ratio	0.08	0.077	0.087	0.06
HCM Control Delay	7.6	7.7	7.8	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.3	0.2

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	97	1	10	75	86	2	46	14	228	44	10
Future Vol, veh/h	7	97	1	10	75	86	2	46	14	228	44	10
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.81	0.81	0.81
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	101	1	11	80	91	2	54	16	281	54	12
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	10	10.1	9.1	12.8
HCM LOS	A	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	77%	0%	99%	0%	47%	0%	81%
Vol Right, %	0%	23%	0%	1%	0%	53%	0%	19%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	60	7	98	10	161	228	54
LT Vol	2	0	7	0	10	0	228	0
Through Vol	0	46	0	97	0	75	0	44
RT Vol	0	14	0	1	0	86	0	10
Lane Flow Rate	2	71	7	102	11	171	281	67
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.004	0.112	0.013	0.171	0.019	0.26	0.462	0.098
Departure Headway (Hd)	6.391	5.72	6.54	6.027	6.354	5.472	5.911	5.278
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	563	630	550	598	558	649	602	671
Service Time	4.097	3.426	4.244	3.73	4.149	3.266	3.709	3.075
HCM Lane V/C Ratio	0.004	0.113	0.013	0.171	0.02	0.263	0.467	0.1
HCM Control Delay	9.1	9.1	9.3	10	9.3	10.2	13.8	8.7
HCM Lane LOS	A	A	A	A	A	B	B	A
HCM 95th-tile Q	0	0.4	0	0.6	0.1	1	2.4	0.3

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	57	19	51	68	16	39	63	57	7	53	32
Future Vol, veh/h	32	57	19	51	68	16	39	63	57	7	53	32
Peak Hour Factor	0.66	0.66	0.66	0.91	0.91	0.91	0.83	0.83	0.83	0.77	0.77	0.77
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	48	86	29	56	75	18	47	76	69	9	69	42
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.2	9.2	9.4	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	25%	100%	0%	100%	0%	8%
Vol Thru, %	40%	0%	75%	0%	81%	58%
Vol Right, %	36%	0%	25%	0%	19%	35%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	159	32	76	51	84	92
LT Vol	39	32	0	51	0	7
Through Vol	63	0	57	0	68	53
RT Vol	57	0	19	0	16	32
Lane Flow Rate	192	48	115	56	92	119
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.252	0.08	0.169	0.093	0.137	0.16
Departure Headway (Hd)	4.74	5.968	5.286	5.983	5.343	4.806
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	755	597	674	595	666	742
Service Time	2.793	3.74	3.058	3.756	3.116	2.865
HCM Lane V/C Ratio	0.254	0.08	0.171	0.094	0.138	0.16
HCM Control Delay	9.4	9.3	9.1	9.4	9	8.8
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	1	0.3	0.6	0.3	0.5	0.6

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	3	1	20	5	48	1	425	28	45	359	1
Future Vol, veh/h	3	3	1	20	5	48	1	425	28	45	359	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	76	76	76	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	5	2	26	7	63	1	500	33	53	422	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1083	1064	423	1051	1048	517	423	0	0	533	0	0
Stage 1	529	529	-	519	519	-	-	-	-	-	-	-
Stage 2	554	535	-	532	529	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	194	222	629	204	227	556	1131	-	-	1030	-	-
Stage 1	531	526	-	538	531	-	-	-	-	-	-	-
Stage 2	515	522	-	529	526	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	161	210	629	192	215	556	1131	-	-	1030	-	-
Mov Cap-2 Maneuver	161	210	-	192	215	-	-	-	-	-	-	-
Stage 1	530	499	-	537	530	-	-	-	-	-	-	-
Stage 2	450	521	-	495	499	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.9	19.6	0	1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1131	-	-	203	342	1030	-	-
HCM Lane V/C Ratio	0.001	-	-	0.059	0.281	0.051	-	-
HCM Control Delay (s)	8.2	-	-	23.9	19.6	8.7	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.1	0.2	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	140	204	51	97	86	48
Future Vol, veh/h	140	204	51	97	86	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	77	77	75	75
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	154	224	66	126	115	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	378	0	524	266
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1175	-	512	770
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1175	-	483	770
Mov Cap-2 Maneuver	-	-	-	-	551	-
Stage 1	-	-	-	-	733	-
Stage 2	-	-	-	-	783	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	551	770	-	-	1175	-
HCM Lane V/C Ratio	0.208	0.083	-	-	0.056	-
HCM Control Delay (s)	13.2	10.1	-	-	8.2	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.8	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	126	50	45	126	22	30
Future Vol, veh/h	126	50	45	126	22	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	79	79	74	74
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	147	58	57	159	30	41

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	205	0	449	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	273	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1360	-	566	865
Stage 1	-	-	-	-	852	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1360	-	542	865
Mov Cap-2 Maneuver	-	-	-	-	591	-
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	771	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	723	-	-	1360	-
HCM Lane V/C Ratio	0.097	-	-	0.042	-
HCM Control Delay (s)	10.5	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	52	41	3	0	68	0	1	1	1	0	0	46
Future Vol, veh/h	52	41	3	0	68	0	1	1	1	0	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	62	62	62	85	85	85	75	75	75	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	84	66	5	0	80	0	1	1	1	0	0	52

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	70	30	26	66	56	2	52	0	0	2	0	0
Stage 1	26	26	-	4	4	-	-	-	-	-	-	-
Stage 2	44	4	-	62	52	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	919	861	1047	925	833	1079	1548	-	-	1614	-	-
Stage 1	989	872	-	1016	890	-	-	-	-	-	-	-
Stage 2	968	890	-	947	850	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	851	860	1047	866	832	1079	1548	-	-	1614	-	-
Mov Cap-2 Maneuver	851	860	-	866	832	-	-	-	-	-	-	-
Stage 1	988	872	-	1015	889	-	-	-	-	-	-	-
Stage 2	880	889	-	871	850	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	9.8	2.4	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1548	-	-	860	832	1614	-	-
HCM Lane V/C Ratio	0.001	-	-	0.18	0.096	-	-	-
HCM Control Delay (s)	7.3	0	-	10.1	9.8	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.3	0	-	-

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	23	1	16	20	0	0	55	2	1	36	8
Future Vol, veh/h	20	23	1	16	20	0	0	55	2	1	36	8
Peak Hour Factor	0.69	0.69	0.69	0.64	0.64	0.64	0.75	0.75	0.75	0.66	0.66	0.66
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	29	33	1	25	31	0	0	73	3	2	55	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	7.8	7.7	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	45%	44%	2%
Vol Thru, %	96%	52%	56%	80%
Vol Right, %	4%	2%	0%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	44	36	45
LT Vol	0	20	16	1
Through Vol	55	23	20	36
RT Vol	2	1	0	8
Lane Flow Rate	76	64	56	68
Geometry Grp	1	1	1	1
Degree of Util (X)	0.088	0.077	0.068	0.078
Departure Headway (Hd)	4.192	4.323	4.341	4.116
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	842	817	813	856
Service Time	2.281	2.411	2.431	2.208
HCM Lane V/C Ratio	0.09	0.078	0.069	0.079
HCM Control Delay	7.7	7.8	7.8	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.2	0.3

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	135	1	9	89	130	2	29	13	236	26	3
Future Vol, veh/h	3	135	1	9	89	130	2	29	13	236	26	3
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.73	0.73	0.73	0.91	0.91	0.91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	152	1	10	98	143	3	40	18	259	29	3
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	10.8	11.2	9.3	13.6
HCM LOS	B	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	69%	0%	99%	0%	41%	0%	90%
Vol Right, %	0%	31%	0%	1%	0%	59%	0%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	42	3	136	9	219	236	29
LT Vol	2	0	3	0	9	0	236	0
Through Vol	0	29	0	135	0	89	0	26
RT Vol	0	13	0	1	0	130	0	3
Lane Flow Rate	3	58	3	153	10	241	259	32
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.005	0.095	0.006	0.254	0.018	0.365	0.454	0.051
Departure Headway (Hd)	6.698	5.971	6.502	5.991	6.387	5.462	6.301	5.723
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	535	600	551	601	561	659	573	627
Service Time	4.435	3.708	4.233	3.722	4.115	3.19	4.026	3.448
HCM Lane V/C Ratio	0.006	0.097	0.005	0.255	0.018	0.366	0.452	0.051
HCM Control Delay	9.5	9.3	9.3	10.8	9.2	11.3	14.2	8.8
HCM Lane LOS	A	A	A	B	A	B	B	A
HCM 95th-tile Q	0	0.3	0	1	0.1	1.7	2.4	0.2

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	76	41	47	75	12	47	65	47	12	62	11
Future Vol, veh/h	28	76	41	47	75	12	47	65	47	12	62	11
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.83	0.83	0.83	0.82	0.82	0.82
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	86	47	53	85	14	57	78	57	15	76	13
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.2	9.2	9.5	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	30%	100%	0%	100%	0%	14%
Vol Thru, %	41%	0%	65%	0%	86%	73%
Vol Right, %	30%	0%	35%	0%	14%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	159	28	117	47	87	85
LT Vol	47	28	0	47	0	12
Through Vol	65	0	76	0	75	62
RT Vol	47	0	41	0	12	11
Lane Flow Rate	192	32	133	53	99	104
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.254	0.053	0.192	0.088	0.147	0.143
Departure Headway (Hd)	4.774	5.945	5.193	5.952	5.35	4.955
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	749	599	686	599	665	718
Service Time	2.83	3.714	2.962	3.723	3.12	3.021
HCM Lane V/C Ratio	0.256	0.053	0.194	0.088	0.149	0.145
HCM Control Delay	9.5	9.1	9.2	9.3	9.1	8.9
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	1	0.2	0.7	0.3	0.5	0.5

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	0	22	6	42	1	293	36	74	183	0
Future Vol, veh/h	0	5	0	22	6	42	1	293	36	74	183	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	80	80	80	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	8	0	28	8	53	1	333	41	84	208	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	762	752	208	736	732	354	208	0	0	374	0	0
Stage 1	376	376	-	356	356	-	-	-	-	-	-	-
Stage 2	386	376	-	380	376	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	320	338	830	333	347	688	1357	-	-	1179	-	-
Stage 1	643	615	-	659	627	-	-	-	-	-	-	-
Stage 2	635	615	-	640	615	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	275	314	830	309	322	688	1357	-	-	1179	-	-
Mov Cap-2 Maneuver	275	314	-	309	322	-	-	-	-	-	-	-
Stage 1	642	571	-	658	626	-	-	-	-	-	-	-
Stage 2	579	614	-	586	571	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	14.6	0	2.4
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1357	-	-	314	464	1179	-	-
HCM Lane V/C Ratio	0.001	-	-	0.025	0.189	0.071	-	-
HCM Control Delay (s)	7.7	-	-	16.8	14.6	8.3	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.7	0.2	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	140	246	45	112	117	57
Future Vol, veh/h	140	246	45	112	117	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	94	94	87	87
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	146	256	48	119	134	66

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	402	0	489	274
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	215	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1151	-	536	762
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	818	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1151	-	513	762
Mov Cap-2 Maneuver	-	-	-	-	578	-
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	818	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	578	762	-	-	1151	-
HCM Lane V/C Ratio	0.233	0.086	-	-	0.042	-
HCM Control Delay (s)	13.1	10.2	-	-	8.3	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.9	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	144	55	40	111	46	46
Future Vol, veh/h	144	55	40	111	46	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	85	85
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	153	59	43	118	54	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	212	0	387	183
Stage 1	-	-	-	-	183	-
Stage 2	-	-	-	-	204	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1352	-	614	857
Stage 1	-	-	-	-	846	-
Stage 2	-	-	-	-	828	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1352	-	594	857
Mov Cap-2 Maneuver	-	-	-	-	637	-
Stage 1	-	-	-	-	819	-
Stage 2	-	-	-	-	828	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	731	-	-	1352	-
HCM Lane V/C Ratio	0.148	-	-	0.031	-
HCM Control Delay (s)	10.8	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	57	46	0	0	48	0	2	0	0	1	2	46
Future Vol, veh/h	57	46	0	0	48	0	2	0	0	1	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	86	86	86	25	25	25	61	61	61
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	69	55	0	0	56	0	8	0	0	2	3	75

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	89	61	41	88	98	0	78	0	0	0	0	0
Stage 1	45	45	-	16	16	-	-	-	-	-	-	-
Stage 2	44	16	-	72	82	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	894	828	1027	895	790	-	1514	-	-	-	-	-
Stage 1	966	855	-	1001	880	-	-	-	-	-	-	-
Stage 2	968	880	-	935	825	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	824	1027	846	786	-	1514	-	-	-	-	-
Mov Cap-2 Maneuver	-	824	-	846	786	-	-	-	-	-	-	-
Stage 1	961	855	-	996	876	-	-	-	-	-	-	-
Stage 2	902	876	-	874	825	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			7.4	
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1514	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-	-	-	-	-
HCM Control Delay (s)	7.4	0	-	-	-	-	-	-
HCM Lane LOS	A	A	-	-	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-	-	-

EXISTING PLUS PROJECT WORKSHEETS

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	32	1	19	33	0	0	78	8	0	72	10
Future Vol, veh/h	16	32	1	19	33	0	0	78	8	0	72	10
Peak Hour Factor	0.77	0.77	0.77	0.72	0.72	0.72	0.82	0.82	0.82	0.73	0.73	0.73
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	21	42	1	26	46	0	0	95	10	0	99	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	8.1	8	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	33%	37%	0%
Vol Thru, %	91%	65%	63%	88%
Vol Right, %	9%	2%	0%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	86	49	52	82
LT Vol	0	16	19	0
Through Vol	78	32	33	72
RT Vol	8	1	0	10
Lane Flow Rate	105	64	72	112
Geometry Grp	1	1	1	1
Degree of Util (X)	0.126	0.081	0.092	0.135
Departure Headway (Hd)	4.337	4.577	4.586	4.312
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	829	785	783	833
Service Time	2.353	2.593	2.603	2.327
HCM Lane V/C Ratio	0.127	0.082	0.092	0.134
HCM Control Delay	8	8	8.1	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.3	0.3	0.5

Intersection	
Intersection Delay, s/veh	15.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	132	1	14	95	141	2	46	19	307	44	10
Future Vol, veh/h	7	132	1	14	95	141	2	46	19	307	44	10
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.81	0.81	0.81
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	138	1	15	101	150	2	54	22	379	54	12
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	11.6	12.9	10.2	19.9
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	71%	0%	99%	0%	40%	0%	81%
Vol Right, %	0%	29%	0%	1%	0%	60%	0%	19%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	65	7	133	14	236	307	54
LT Vol	2	0	7	0	14	0	307	0
Through Vol	0	46	0	132	0	95	0	44
RT Vol	0	19	0	1	0	141	0	10
Lane Flow Rate	2	76	7	139	15	251	379	67
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.005	0.136	0.014	0.255	0.029	0.419	0.679	0.108
Departure Headway (Hd)	7.097	6.379	7.142	6.628	6.946	6.014	6.454	5.817
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	503	560	500	540	514	598	561	615
Service Time	4.861	4.143	4.907	4.393	4.704	3.772	4.197	3.56
HCM Lane V/C Ratio	0.004	0.136	0.014	0.257	0.029	0.42	0.676	0.109
HCM Control Delay	9.9	10.2	10	11.7	9.9	13.1	21.8	9.3
HCM Lane LOS	A	B	A	B	A	B	C	A
HCM 95th-tile Q	0	0.5	0	1	0.1	2.1	5.2	0.4

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	89	24	72	113	16	53	76	73	7	72	44
Future Vol, veh/h	43	89	24	72	113	16	53	76	73	7	72	44
Peak Hour Factor	0.66	0.66	0.66	0.91	0.91	0.91	0.83	0.83	0.83	0.77	0.77	0.77
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	65	135	36	79	124	18	64	92	88	9	94	57
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	10.7	10.5	11.4	10.2
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	26%	100%	0%	100%	0%	6%
Vol Thru, %	38%	0%	79%	0%	88%	59%
Vol Right, %	36%	0%	21%	0%	12%	36%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	202	43	113	72	129	123
LT Vol	53	43	0	72	0	7
Through Vol	76	0	89	0	113	72
RT Vol	73	0	24	0	16	44
Lane Flow Rate	243	65	171	79	142	160
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.36	0.118	0.279	0.144	0.234	0.241
Departure Headway (Hd)	5.33	6.518	5.86	6.536	5.94	5.439
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	674	550	613	548	604	658
Service Time	3.371	4.256	3.597	4.276	3.679	3.484
HCM Lane V/C Ratio	0.361	0.118	0.279	0.144	0.235	0.243
HCM Control Delay	11.4	10.1	10.9	10.4	10.5	10.2
HCM Lane LOS	B	B	B	B	B	B
HCM 95th-tile Q	1.6	0.4	1.1	0.5	0.9	0.9

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↱		↰	↱	
Traffic Vol, veh/h	3	3	1	25	5	63	1	425	37	71	359	1
Future Vol, veh/h	3	3	1	25	5	63	1	425	37	71	359	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	76	76	76	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	5	2	33	7	83	1	500	44	84	422	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1160	1137	423	1118	1115	522	423	0	0	544	0	0
Stage 1	591	591	-	524	524	-	-	-	-	-	-	-
Stage 2	569	546	-	594	591	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	172	201	629	183	207	553	1131	-	-	1020	-	-
Stage 1	492	493	-	535	528	-	-	-	-	-	-	-
Stage 2	505	516	-	490	493	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	133	184	629	167	190	553	1131	-	-	1020	-	-
Mov Cap-2 Maneuver	133	184	-	167	190	-	-	-	-	-	-	-
Stage 1	492	453	-	534	527	-	-	-	-	-	-	-
Stage 2	424	515	-	443	453	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.4	23	0	1.5
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1131	-	-	173	321	1020	-	-
HCM Lane V/C Ratio	0.001	-	-	0.07	0.381	0.082	-	-
HCM Control Delay (s)	8.2	-	-	27.4	23	8.8	-	-
HCM Lane LOS	A	-	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.7	0.3	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	180	282	68	135	128	59
Future Vol, veh/h	180	282	68	135	128	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	77	77	75	75
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	198	310	88	175	171	79

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	508	0	704	353
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	351	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1052	-	402	688
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	710	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1052	-	368	688
Mov Cap-2 Maneuver	-	-	-	-	458	-
Stage 1	-	-	-	-	649	-
Stage 2	-	-	-	-	710	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	15.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	458	688	-	-	1052	-
HCM Lane V/C Ratio	0.373	0.114	-	-	0.084	-
HCM Control Delay (s)	17.5	10.9	-	-	8.7	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.7	0.4	-	-	0.3	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	160	67	62	170	33	41
Future Vol, veh/h	160	67	62	170	33	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	79	79	74	74
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	186	78	78	215	45	55

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	264	0	596	225
Stage 1	-	-	-	-	225	-
Stage 2	-	-	-	-	371	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1294	-	465	812
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	696	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1294	-	437	812
Mov Cap-2 Maneuver	-	-	-	-	505	-
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	639	-	-	1294	-
HCM Lane V/C Ratio	0.156	-	-	0.061	-
HCM Control Delay (s)	11.7	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	82	46	3	0	77	0	1	1	1	0	0	90
Future Vol, veh/h	82	46	3	0	77	0	1	1	1	0	0	90
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	62	62	62	85	85	85	75	75	75	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	132	74	5	0	91	0	1	1	1	0	0	101

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	100	55	51	94	105	2	101	0	0	2	0	0
Stage 1	51	51	-	4	4	-	-	-	-	-	-	-
Stage 2	49	4	-	90	101	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	879	834	1014	887	783	1079	1485	-	-	1614	-	-
Stage 1	959	850	-	1016	890	-	-	-	-	-	-	-
Stage 2	962	890	-	915	810	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	801	833	1014	822	782	1079	1485	-	-	1614	-	-
Mov Cap-2 Maneuver	801	833	-	822	782	-	-	-	-	-	-	-
Stage 1	958	850	-	1015	889	-	-	-	-	-	-	-
Stage 2	863	889	-	831	810	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.9	10.2	2.5	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1485	-	-	816	782	1614	-	-
HCM Lane V/C Ratio	0.001	-	-	0.259	0.116	-	-	-
HCM Control Delay (s)	7.4	0	-	10.9	10.2	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1	0.4	0	-	-

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	23	1	16	20	0	0	92	2	1	88	8
Future Vol, veh/h	20	23	1	16	20	0	0	92	2	1	88	8
Peak Hour Factor	0.69	0.69	0.69	0.64	0.64	0.64	0.75	0.75	0.75	0.66	0.66	0.66
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	29	33	1	25	31	0	0	123	3	2	133	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	8.1	8.2	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	45%	44%	1%
Vol Thru, %	98%	52%	56%	91%
Vol Right, %	2%	2%	0%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	94	44	36	97
LT Vol	0	20	16	1
Through Vol	92	23	20	88
RT Vol	2	1	0	8
Lane Flow Rate	125	64	56	147
Geometry Grp	1	1	1	1
Degree of Util (X)	0.153	0.083	0.074	0.177
Departure Headway (Hd)	4.386	4.709	4.73	4.329
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	820	762	758	830
Service Time	2.402	2.731	2.752	2.346
HCM Lane V/C Ratio	0.152	0.084	0.074	0.177
HCM Control Delay	8.2	8.2	8.1	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.3	0.2	0.6

Intersection	
Intersection Delay, s/veh	18
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	178	1	13	117	197	2	29	18	329	26	3
Future Vol, veh/h	3	178	1	13	117	197	2	29	18	329	26	3
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.73	0.73	0.73	0.91	0.91	0.91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	200	1	14	129	216	3	40	25	362	29	3
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	13.5	16.7	10.6	22.7
HCM LOS	B	C	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	62%	0%	99%	0%	37%	0%	90%
Vol Right, %	0%	38%	0%	1%	0%	63%	0%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	47	3	179	13	314	329	29
LT Vol	2	0	3	0	13	0	329	0
Through Vol	0	29	0	178	0	117	0	26
RT Vol	0	18	0	1	0	197	0	3
Lane Flow Rate	3	64	3	201	14	345	362	32
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.006	0.124	0.007	0.376	0.028	0.58	0.693	0.056
Departure Headway (Hd)	7.747	6.959	7.249	6.736	7.008	6.054	6.898	6.317
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	465	518	490	529	508	590	521	564
Service Time	5.447	4.659	5.047	4.533	4.793	3.838	4.67	4.089
HCM Lane V/C Ratio	0.006	0.124	0.006	0.38	0.028	0.585	0.695	0.057
HCM Control Delay	10.5	10.6	10.1	13.6	10	17	23.9	9.5
HCM Lane LOS	B	B	B	B	A	C	C	A
HCM 95th-tile Q	0	0.4	0	1.7	0.1	3.7	5.3	0.2

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	114	45	71	127	12	63	80	66	12	84	24
Future Vol, veh/h	40	114	45	71	127	12	63	80	66	12	84	24
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.83	0.83	0.83	0.82	0.82	0.82
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	45	130	51	81	144	14	76	96	80	15	102	29
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	10.8	10.7	11.6	10.3
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	30%	100%	0%	100%	0%	10%
Vol Thru, %	38%	0%	72%	0%	91%	70%
Vol Right, %	32%	0%	28%	0%	9%	20%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	209	40	159	71	139	120
LT Vol	63	40	0	71	0	12
Through Vol	80	0	114	0	127	84
RT Vol	66	0	45	0	12	24
Lane Flow Rate	252	45	181	81	158	146
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.376	0.083	0.293	0.146	0.261	0.227
Departure Headway (Hd)	5.372	6.549	5.84	6.522	5.953	5.588
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	670	547	614	549	603	641
Service Time	3.411	4.289	3.58	4.263	3.693	3.633
HCM Lane V/C Ratio	0.376	0.082	0.295	0.148	0.262	0.228
HCM Control Delay	11.6	9.9	11	10.4	10.8	10.3
HCM Lane LOS	B	A	B	B	B	B
HCM 95th-tile Q	1.7	0.3	1.2	0.5	1	0.9

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	0	29	6	63	1	293	47	106	183	0
Future Vol, veh/h	0	5	0	29	6	63	1	293	47	106	183	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	80	80	80	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	8	0	36	8	79	1	333	53	120	208	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	853	836	208	814	810	360	208	0	0	386	0	0
Stage 1	448	448	-	362	362	-	-	-	-	-	-	-
Stage 2	405	388	-	452	448	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	278	302	830	295	313	682	1357	-	-	1167	-	-
Stage 1	588	571	-	655	623	-	-	-	-	-	-	-
Stage 2	620	607	-	585	571	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	222	271	830	266	280	682	1357	-	-	1167	-	-
Mov Cap-2 Maneuver	222	271	-	266	280	-	-	-	-	-	-	-
Stage 1	587	512	-	654	622	-	-	-	-	-	-	-
Stage 2	541	606	-	517	512	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.7	16.3	0	3.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1357	-	-	271	440	1167	-	-
HCM Lane V/C Ratio	0.001	-	-	0.029	0.278	0.103	-	-
HCM Control Delay (s)	7.7	-	-	18.7	16.3	8.4	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.1	0.3	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	184	342	66	155	173	71
Future Vol, veh/h	184	342	66	155	173	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	94	94	87	87
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	192	356	70	165	199	82

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	548	0	675	370
Stage 1	-	-	-	-	370	-
Stage 2	-	-	-	-	305	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1016	-	418	673
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	745	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1016	-	389	673
Mov Cap-2 Maneuver	-	-	-	-	479	-
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	745	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	479	673	-	-	1016	-
HCM Lane V/C Ratio	0.415	0.121	-	-	0.069	-
HCM Control Delay (s)	17.7	11.1	-	-	8.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	2	0.4	-	-	0.2	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	181	76	61	161	60	60
Future Vol, veh/h	181	76	61	161	60	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	85	85
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	193	81	65	171	71	71

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	274	0	535	234
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	301	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1283	-	504	803
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1283	-	478	803
Mov Cap-2 Maneuver	-	-	-	-	545	-
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	748	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	649	-	-	1283	-
HCM Lane V/C Ratio	0.218	-	-	0.051	-
HCM Control Delay (s)	12.1	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇅			⇅			⇅			⇅	
Traffic Vol, veh/h	94	53	0	0	59	0	2	0	0	1	2	98
Future Vol, veh/h	94	53	0	0	59	0	2	0	0	1	2	98
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	86	86	86	25	25	25	61	61	61
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	113	64	0	0	69	0	8	0	0	2	3	161

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	139	104	84	136	184	0	164	0	0	0	0	0
Stage 1	88	88	-	16	16	-	-	-	-	-	-	-
Stage 2	51	16	-	120	168	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	829	784	972	833	708	-	1408	-	-	-	-	-
Stage 1	917	820	-	1001	880	-	-	-	-	-	-	-
Stage 2	959	880	-	882	758	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	779	972	777	704	-	1408	-	-	-	-	-
Mov Cap-2 Maneuver	-	779	-	777	704	-	-	-	-	-	-	-
Stage 1	911	820	-	995	875	-	-	-	-	-	-	-
Stage 2	879	875	-	813	758	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			7.6	
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1408	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.006	-	-	-	-	-	-	-
HCM Control Delay (s)	7.6	0	-	-	-	-	-	-
HCM Lane LOS	A	A	-	-	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-	-	-

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	32	1	19	33	0	0	77	8	0	170	10
Future Vol, veh/h	16	32	1	19	33	0	0	77	8	0	170	10
Peak Hour Factor	0.77	0.77	0.77	0.72	0.72	0.72	0.82	0.82	0.82	0.73	0.73	0.73
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	21	42	1	26	46	0	0	94	10	0	233	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8.5	8.2	9.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	33%	37%	0%
Vol Thru, %	91%	65%	63%	94%
Vol Right, %	9%	2%	0%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	85	49	52	180
LT Vol	0	16	19	0
Through Vol	77	32	33	170
RT Vol	8	1	0	10
Lane Flow Rate	104	64	72	247
Geometry Grp	1	1	1	1
Degree of Util (X)	0.13	0.086	0.098	0.299
Departure Headway (Hd)	4.5	4.892	4.899	4.372
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	797	732	732	824
Service Time	2.525	2.923	2.93	2.392
HCM Lane V/C Ratio	0.13	0.087	0.098	0.3
HCM Control Delay	8.2	8.4	8.5	9.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.3	0.3	1.3

Intersection	
Intersection Delay, s/veh	61.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	230	1	14	95	139	2	46	19	479	44	10
Future Vol, veh/h	7	230	1	14	95	139	2	46	19	479	44	10
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.81	0.81	0.81
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	240	1	15	101	148	2	54	22	591	54	12
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	17.5	16.2	11.8	102.6
HCM LOS	C	C	B	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	71%	0%	100%	0%	41%	0%	81%
Vol Right, %	0%	29%	0%	0%	0%	59%	0%	19%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	65	7	231	14	234	479	54
LT Vol	2	0	7	0	14	0	479	0
Through Vol	0	46	0	230	0	95	0	44
RT Vol	0	19	0	1	0	139	0	10
Lane Flow Rate	2	76	7	241	15	249	591	67
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.005	0.155	0.016	0.49	0.032	0.477	1.151	0.118
Departure Headway (Hd)	8.387	7.659	8.271	7.754	8.276	7.335	7.005	6.365
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	429	471	435	467	435	495	520	564
Service Time	6.087	5.359	5.971	5.454	5.976	5.035	4.738	4.098
HCM Lane V/C Ratio	0.005	0.161	0.016	0.516	0.034	0.503	1.137	0.119
HCM Control Delay	11.1	11.8	11.1	17.7	11.2	16.5	113	10
HCM Lane LOS	B	B	B	C	B	C	F	A
HCM 95th-tile Q	0	0.5	0	2.6	0.1	2.5	20.5	0.4

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	88	24	173	135	16	53	76	73	7	111	54
Future Vol, veh/h	43	88	24	173	135	16	53	76	73	7	111	54
Peak Hour Factor	0.66	0.66	0.66	0.91	0.91	0.91	0.83	0.83	0.83	0.77	0.77	0.77
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	65	133	36	190	148	18	64	92	88	9	144	70
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11.7	12.6	12.9	12.5
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	26%	100%	0%	100%	0%	4%
Vol Thru, %	38%	0%	79%	0%	89%	65%
Vol Right, %	36%	0%	21%	0%	11%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	202	43	112	173	151	172
LT Vol	53	43	0	173	0	7
Through Vol	76	0	88	0	135	111
RT Vol	73	0	24	0	16	54
Lane Flow Rate	243	65	170	190	166	223
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.399	0.128	0.302	0.363	0.29	0.368
Departure Headway (Hd)	5.909	7.074	6.41	6.868	6.283	5.936
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	604	504	557	521	569	601
Service Time	3.99	4.859	4.194	4.644	4.059	4.019
HCM Lane V/C Ratio	0.402	0.129	0.305	0.365	0.292	0.371
HCM Control Delay	12.9	10.9	12	13.5	11.6	12.5
HCM Lane LOS	B	B	B	B	B	B
HCM 95th-tile Q	1.9	0.4	1.3	1.6	1.2	1.7

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	3	1	25	5	63	1	425	61	145	359	1
Future Vol, veh/h	3	3	1	25	5	63	1	425	61	145	359	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	76	76	76	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	5	2	33	7	83	1	500	72	171	422	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1348	1339	423	1306	1303	536	423	0	0	572	0	0
Stage 1	765	765	-	538	538	-	-	-	-	-	-	-
Stage 2	583	574	-	768	765	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	127	152	629	136	160	543	1131	-	-	996	-	-
Stage 1	394	411	-	525	521	-	-	-	-	-	-	-
Stage 2	496	502	-	393	411	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	90	126	629	114	132	543	1131	-	-	996	-	-
Mov Cap-2 Maneuver	90	126	-	114	132	-	-	-	-	-	-	-
Stage 1	394	340	-	524	520	-	-	-	-	-	-	-
Stage 2	415	501	-	320	340	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	38.6	32.7	0	2.7
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1131	-	-	119	249	996	-	-
HCM Lane V/C Ratio	0.001	-	-	0.101	0.491	0.171	-	-
HCM Control Delay (s)	8.2	-	-	38.6	32.7	9.4	-	-
HCM Lane LOS	A	-	-	E	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	2.5	0.6	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	329	404	84	134	126	58
Future Vol, veh/h	329	404	84	134	126	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	77	77	75	75
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	362	444	109	174	168	77

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	806	0	976	584
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	392	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	814	-	277	510
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	681	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	814	-	240	510
Mov Cap-2 Maneuver	-	-	-	-	347	-
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	681	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	21.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	347	510	-	-	814	-
HCM Lane V/C Ratio	0.484	0.152	-	-	0.134	-
HCM Control Delay (s)	24.7	13.3	-	-	10.1	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	2.5	0.5	-	-	0.5	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	159	216	78	186	32	40
Future Vol, veh/h	159	216	78	186	32	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	79	79	74	74
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	185	251	99	235	43	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	436	0	744	311
Stage 1	-	-	-	-	311	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1118	-	381	727
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	652	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1118	-	347	727
Mov Cap-2 Maneuver	-	-	-	-	432	-
Stage 1	-	-	-	-	675	-
Stage 2	-	-	-	-	652	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.5	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	558	-	-	1118	-
HCM Lane V/C Ratio	0.174	-	-	0.088	-
HCM Control Delay (s)	12.8	-	-	8.5	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.3	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	81	46	3	0	101	0	1	1	1	0	0	188
Future Vol, veh/h	81	46	3	0	101	0	1	1	1	0	0	188
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	62	62	62	85	85	85	75	75	75	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	131	74	5	0	119	0	1	1	1	0	0	211

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	169	110	106	149	215	2	211	0	0	2	0	0
Stage 1	106	106	-	4	4	-	-	-	-	-	-	-
Stage 2	63	4	-	145	211	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	792	778	946	817	681	1079	1354	-	-	1614	-	-
Stage 1	897	806	-	1016	890	-	-	-	-	-	-	-
Stage 2	945	890	-	855	726	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	685	777	946	752	680	1079	1354	-	-	1614	-	-
Mov Cap-2 Maneuver	685	777	-	752	680	-	-	-	-	-	-	-
Stage 1	896	806	-	1015	889	-	-	-	-	-	-	-
Stage 2	818	889	-	772	726	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	11.4	2.6	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1354	-	-	720	680	1614	-	-
HCM Lane V/C Ratio	0.001	-	-	0.291	0.175	-	-	-
HCM Control Delay (s)	7.7	0	-	12	11.4	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0.6	0	-	-

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	32	1	19	33	0	0	181	8	0	66	10
Future Vol, veh/h	16	32	1	19	33	0	0	181	8	0	66	10
Peak Hour Factor	0.77	0.77	0.77	0.72	0.72	0.72	0.82	0.82	0.82	0.73	0.73	0.73
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	21	42	1	26	46	0	0	221	10	0	90	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	8.4	9.1	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	33%	37%	0%
Vol Thru, %	96%	65%	63%	87%
Vol Right, %	4%	2%	0%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	189	49	52	76
LT Vol	0	16	19	0
Through Vol	181	32	33	66
RT Vol	8	1	0	10
Lane Flow Rate	230	64	72	104
Geometry Grp	1	1	1	1
Degree of Util (X)	0.28	0.086	0.098	0.129
Departure Headway (Hd)	4.377	4.854	4.863	4.459
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	823	738	737	804
Service Time	2.399	2.884	2.892	2.485
HCM Lane V/C Ratio	0.279	0.087	0.098	0.129
HCM Control Delay	9.1	8.3	8.4	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.1	0.3	0.3	0.4

Intersection	
Intersection Delay, s/veh	36.9
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	126	1	14	199	321	2	46	19	297	44	10
Future Vol, veh/h	7	126	1	14	199	321	2	46	19	297	44	10
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.81	0.81	0.81
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	131	1	15	212	341	2	54	22	367	54	12
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	13.1	52.9	12.1	28
HCM LOS	B	F	B	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	71%	0%	99%	0%	38%	0%	81%
Vol Right, %	0%	29%	0%	1%	0%	62%	0%	19%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	65	7	127	14	520	297	54
LT Vol	2	0	7	0	14	0	297	0
Through Vol	0	46	0	126	0	199	0	44
RT Vol	0	19	0	1	0	321	0	10
Lane Flow Rate	2	76	7	132	15	553	367	67
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.006	0.165	0.016	0.277	0.03	0.965	0.768	0.128
Departure Headway (Hd)	8.496	7.768	8.065	7.545	7.229	6.281	7.536	6.894
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	420	460	443	475	496	575	480	520
Service Time	6.262	5.534	5.825	5.304	4.969	4.02	5.282	4.64
HCM Lane V/C Ratio	0.005	0.165	0.016	0.278	0.03	0.962	0.765	0.129
HCM Control Delay	11.3	12.1	11	13.2	10.2	54.1	31.2	10.7
HCM Lane LOS	B	B	B	B	B	F	D	B
HCM 95th-tile Q	0	0.6	0	1.1	0.1	13.2	6.7	0.4

Intersection	
Intersection Delay, s/veh	19.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	53	182	24	70	108	16	141	118	109	7	70	44
Future Vol, veh/h	53	182	24	70	108	16	141	118	109	7	70	44
Peak Hour Factor	0.66	0.66	0.66	0.91	0.91	0.91	0.83	0.83	0.83	0.77	0.77	0.77
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	80	276	36	77	119	18	170	142	131	9	91	57
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	17.9	12.6	25.8	12.6
HCM LOS	C	B	D	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	38%	100%	0%	100%	0%	6%
Vol Thru, %	32%	0%	88%	0%	87%	58%
Vol Right, %	30%	0%	12%	0%	13%	36%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	368	53	206	70	124	121
LT Vol	141	53	0	70	0	7
Through Vol	118	0	182	0	108	70
RT Vol	109	0	24	0	16	44
Lane Flow Rate	443	80	312	77	136	157
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.756	0.167	0.598	0.168	0.275	0.294
Departure Headway (Hd)	6.136	7.495	6.898	7.869	7.261	6.737
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	590	479	521	455	493	531
Service Time	4.18	5.247	4.65	5.63	5.022	4.799
HCM Lane V/C Ratio	0.751	0.167	0.599	0.169	0.276	0.296
HCM Control Delay	25.8	11.8	19.5	12.2	12.8	12.6
HCM Lane LOS	D	B	C	B	B	B
HCM 95th-tile Q	6.7	0.6	3.9	0.6	1.1	1.2

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	3	1	51	5	141	1	425	35	67	359	1
Future Vol, veh/h	3	3	1	51	5	141	1	425	35	67	359	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	76	76	76	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	5	2	67	7	186	1	500	41	79	422	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1200	1124	423	1107	1104	521	423	0	0	541	0	0
Stage 1	581	581	-	523	523	-	-	-	-	-	-	-
Stage 2	619	543	-	584	581	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	161	204	629	187	210	553	1131	-	-	1023	-	-
Stage 1	498	498	-	535	529	-	-	-	-	-	-	-
Stage 2	474	518	-	496	498	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	98	188	629	172	194	553	1131	-	-	1023	-	-
Mov Cap-2 Maneuver	98	188	-	172	194	-	-	-	-	-	-	-
Stage 1	498	460	-	534	528	-	-	-	-	-	-	-
Stage 2	311	517	-	451	460	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.1	42.4	0	1.4
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1131	-	-	145	341	1023	-	-
HCM Lane V/C Ratio	0.001	-	-	0.083	0.76	0.077	-	-
HCM Control Delay (s)	8.2	-	-	32.1	42.4	8.8	-	-
HCM Lane LOS	A	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	6	0.2	-	-

Intersection	
Int Delay, s/veh	19.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	178	270	66	304	272	110
Future Vol, veh/h	178	270	66	304	272	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	77	77	75	75
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	196	297	86	395	363	147

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	493	0	912	345
Stage 1	-	-	-	-	345	-
Stage 2	-	-	-	-	567	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1065	-	~ 303	696
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	566	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1065	-	~ 278	696
Mov Cap-2 Maneuver	-	-	-	-	374	-
Stage 1	-	-	-	-	657	-
Stage 2	-	-	-	-	566	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	55.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	374	696	-	-	1065	-
HCM Lane V/C Ratio	0.97	0.211	-	-	0.08	-
HCM Control Delay (s)	73	11.5	-	-	8.7	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	11	0.8	-	-	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	211	65	60	255	115	92
Future Vol, veh/h	211	65	60	255	115	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	79	79	74	74
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	245	76	76	323	155	124

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	321	0	758	283
Stage 1	-	-	-	-	283	-
Stage 2	-	-	-	-	475	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1233	-	373	754
Stage 1	-	-	-	-	763	-
Stage 2	-	-	-	-	624	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1233	-	350	754
Mov Cap-2 Maneuver	-	-	-	-	437	-
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	624	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	18.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	537	-	-	1233	-
HCM Lane V/C Ratio	0.521	-	-	0.062	-
HCM Control Delay (s)	18.8	-	-	8.1	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	3	-	-	0.2	-

Intersection	
Int Delay, s/veh	11.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	185	72	3	0	75	0	1	1	1	0	0	84
Future Vol, veh/h	185	72	3	0	75	0	1	1	1	0	0	84
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	62	62	62	85	85	85	75	75	75	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	298	116	5	0	88	0	1	1	1	0	0	94

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	95	51	47	112	98	2	94	0	0	2	0	0
Stage 1	47	47	-	4	4	-	-	-	-	-	-	-
Stage 2	48	4	-	108	94	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	886	838	1019	863	790	1079	1494	-	-	1614	-	-
Stage 1	964	854	-	1016	890	-	-	-	-	-	-	-
Stage 2	963	890	-	895	815	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	810	837	1019	767	789	1079	1494	-	-	1614	-	-
Mov Cap-2 Maneuver	810	837	-	767	789	-	-	-	-	-	-	-
Stage 1	963	854	-	1015	889	-	-	-	-	-	-	-
Stage 2	867	889	-	770	815	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.9	10.1	2.5	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1494	-	-	819	789	1614	-	-
HCM Lane V/C Ratio	0.001	-	-	0.512	0.112	-	-	-
HCM Control Delay (s)	7.4	0	-	13.9	10.1	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	3	0.4	0	-	-

NEAR-TERM
WORKSHEETS

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	34	1	20	35	0	0	81	9	0	74	11
Future Vol, veh/h	17	34	1	20	35	0	0	81	9	0	74	11
Peak Hour Factor	0.77	0.77	0.77	0.72	0.72	0.72	0.82	0.82	0.82	0.73	0.73	0.73
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	22	44	1	28	49	0	0	99	11	0	101	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	8.1	8	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	33%	36%	0%
Vol Thru, %	90%	65%	64%	87%
Vol Right, %	10%	2%	0%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	52	55	85
LT Vol	0	17	20	0
Through Vol	81	34	35	74
RT Vol	9	1	0	11
Lane Flow Rate	110	68	76	116
Geometry Grp	1	1	1	1
Degree of Util (X)	0.133	0.086	0.098	0.14
Departure Headway (Hd)	4.361	4.604	4.613	4.337
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	824	780	778	829
Service Time	2.375	2.623	2.63	2.351
HCM Lane V/C Ratio	0.133	0.087	0.098	0.14
HCM Control Delay	8	8.1	8.1	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.3	0.3	0.5

Intersection	
Intersection Delay, s/veh	17.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	138	1	15	100	147	2	49	20	322	47	11
Future Vol, veh/h	7	138	1	15	100	147	2	49	20	322	47	11
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.85	0.85	0.85	0.81	0.81	0.81
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	144	1	16	106	156	2	58	24	398	58	14
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	12	13.6	10.4	22.3
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	71%	0%	99%	0%	40%	0%	81%
Vol Right, %	0%	29%	0%	1%	0%	60%	0%	19%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	69	7	139	15	247	322	58
LT Vol	2	0	7	0	15	0	322	0
Through Vol	0	49	0	138	0	100	0	47
RT Vol	0	20	0	1	0	147	0	11
Lane Flow Rate	2	81	7	145	16	263	398	72
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.005	0.147	0.015	0.272	0.031	0.448	0.723	0.117
Departure Headway (Hd)	7.241	6.524	7.285	6.77	7.07	6.138	6.545	5.905
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	492	546	489	528	505	583	553	606
Service Time	5.021	4.303	5.06	4.545	4.836	3.904	4.296	3.656
HCM Lane V/C Ratio	0.004	0.148	0.014	0.275	0.032	0.451	0.72	0.119
HCM Control Delay	10.1	10.4	10.2	12.1	10.1	13.8	24.6	9.4
HCM Lane LOS	B	B	B	B	B	B	C	A
HCM 95th-tile Q	0	0.5	0	1.1	0.1	2.3	6	0.4

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	93	25	75	117	17	56	80	77	7	75	46
Future Vol, veh/h	45	93	25	75	117	17	56	80	77	7	75	46
Peak Hour Factor	0.66	0.66	0.66	0.91	0.91	0.91	0.83	0.83	0.83	0.77	0.77	0.77
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	68	141	38	82	129	19	67	96	93	9	97	60
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11	10.7	11.9	10.5
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	26%	100%	0%	100%	0%	5%
Vol Thru, %	38%	0%	79%	0%	87%	59%
Vol Right, %	36%	0%	21%	0%	13%	36%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	213	45	118	75	134	128
LT Vol	56	45	0	75	0	7
Through Vol	80	0	93	0	117	75
RT Vol	77	0	25	0	17	46
Lane Flow Rate	257	68	179	82	147	166
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.386	0.125	0.296	0.152	0.247	0.256
Departure Headway (Hd)	5.414	6.613	5.954	6.635	6.036	5.539
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	662	541	603	540	593	647
Service Time	3.46	4.36	3.701	4.383	3.784	3.59
HCM Lane V/C Ratio	0.388	0.126	0.297	0.152	0.248	0.257
HCM Control Delay	11.9	10.3	11.2	10.6	10.8	10.5
HCM Lane LOS	B	B	B	B	B	B
HCM 95th-tile Q	1.8	0.4	1.2	0.5	1	1

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	3	1	26	5	66	1	452	39	74	382	1
Future Vol, veh/h	3	3	1	26	5	66	1	452	39	74	382	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	76	76	76	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	5	2	34	7	87	1	532	46	87	449	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1228	1204	450	1184	1181	555	450	0	0	578	0	0
Stage 1	624	624	-	557	557	-	-	-	-	-	-	-
Stage 2	604	580	-	627	624	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	154	183	607	165	189	529	1105	-	-	991	-	-
Stage 1	471	476	-	513	511	-	-	-	-	-	-	-
Stage 2	484	499	-	470	476	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	117	167	607	150	172	529	1105	-	-	991	-	-
Mov Cap-2 Maneuver	117	167	-	150	172	-	-	-	-	-	-	-
Stage 1	471	434	-	512	510	-	-	-	-	-	-	-
Stage 2	399	499	-	422	434	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.2	26.1	0	1.5
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1105	-	-	155	296	991	-	-
HCM Lane V/C Ratio	0.001	-	-	0.078	0.431	0.088	-	-
HCM Control Delay (s)	8.3	-	-	30.2	26.1	9	-	-
HCM Lane LOS	A	-	-	D	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	2.1	0.3	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	189	282	68	141	128	59
Future Vol, veh/h	189	282	68	141	128	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	77	77	75	75
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	208	310	88	183	171	79

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	518	0	722	363
Stage 1	-	-	-	-	363	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1043	-	392	680
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1043	-	359	680
Mov Cap-2 Maneuver	-	-	-	-	451	-
Stage 1	-	-	-	-	643	-
Stage 2	-	-	-	-	704	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	15.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	451	680	-	-	1043	-
HCM Lane V/C Ratio	0.378	0.116	-	-	0.085	-
HCM Control Delay (s)	17.8	11	-	-	8.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.7	0.4	-	-	0.3	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	168	67	62	178	33	41
Future Vol, veh/h	168	67	62	178	33	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	79	79	74	74
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	195	78	78	225	45	55

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	273	0	615	234
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	381	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1284	-	453	803
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	688	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1284	-	425	803
Mov Cap-2 Maneuver	-	-	-	-	496	-
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	688	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	629	-	-	1284	-
HCM Lane V/C Ratio	0.159	-	-	0.061	-
HCM Control Delay (s)	11.8	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	85	49	3	0	81	0	1	1	1	0	0	93
Future Vol, veh/h	85	49	3	0	81	0	1	1	1	0	0	93
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	62	62	62	85	85	85	75	75	75	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	137	79	5	0	95	0	1	1	1	0	0	104

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	103	56	52	98	108	2	104	0	0	2	0	0
Stage 1	52	52	-	4	4	-	-	-	-	-	-	-
Stage 2	51	4	-	94	104	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	875	833	1013	882	780	1079	1481	-	-	1614	-	-
Stage 1	958	850	-	1016	890	-	-	-	-	-	-	-
Stage 2	959	890	-	910	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	793	832	1013	813	779	1079	1481	-	-	1614	-	-
Mov Cap-2 Maneuver	793	832	-	813	779	-	-	-	-	-	-	-
Stage 1	957	850	-	1015	889	-	-	-	-	-	-	-
Stage 2	855	889	-	821	807	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.1	10.3	2.5	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1481	-	-	810	779	1614	-	-
HCM Lane V/C Ratio	0.001	-	-	0.273	0.122	-	-	-
HCM Control Delay (s)	7.4	0	-	11.1	10.3	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.1	0.4	0	-	-

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	24	1	17	21	0	0	96	2	1	90	9
Future Vol, veh/h	21	24	1	17	21	0	0	96	2	1	90	9
Peak Hour Factor	0.69	0.69	0.69	0.64	0.64	0.64	0.75	0.75	0.75	0.66	0.66	0.66
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	30	35	1	27	33	0	0	128	3	2	136	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	8.2	8.3	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	46%	45%	1%
Vol Thru, %	98%	52%	55%	90%
Vol Right, %	2%	2%	0%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	98	46	38	100
LT Vol	0	21	17	1
Through Vol	96	24	21	90
RT Vol	2	1	0	9
Lane Flow Rate	131	67	59	152
Geometry Grp	1	1	1	1
Degree of Util (X)	0.16	0.088	0.078	0.183
Departure Headway (Hd)	4.41	4.74	4.759	4.349
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	815	757	753	827
Service Time	2.426	2.761	2.782	2.365
HCM Lane V/C Ratio	0.161	0.089	0.078	0.184
HCM Control Delay	8.3	8.2	8.2	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.3	0.3	0.7

Intersection	
Intersection Delay, s/veh	20.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	187	1	14	123	205	2	31	19	344	28	3
Future Vol, veh/h	3	187	1	14	123	205	2	31	19	344	28	3
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.73	0.73	0.73	0.91	0.91	0.91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	210	1	15	135	225	3	42	26	378	31	3
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	14.5	18.8	11.1	26.5
HCM LOS	B	C	B	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	62%	0%	99%	0%	38%	0%	90%
Vol Right, %	0%	38%	0%	1%	0%	62%	0%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	2	50	3	188	14	328	344	31
LT Vol	2	0	3	0	14	0	344	0
Through Vol	0	31	0	187	0	123	0	28
RT Vol	0	19	0	1	0	205	0	3
Lane Flow Rate	3	68	3	211	15	360	378	34
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.006	0.136	0.007	0.411	0.031	0.63	0.747	0.061
Departure Headway (Hd)	7.958	7.171	7.518	7.003	7.252	6.297	7.117	6.557
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	450	499	476	515	495	577	510	549
Service Time	5.709	4.921	5.256	4.741	4.972	4.017	4.835	4.257
HCM Lane V/C Ratio	0.007	0.136	0.006	0.41	0.03	0.624	0.741	0.062
HCM Control Delay	10.8	11.1	10.3	14.6	10.2	19.2	28	9.7
HCM Lane LOS	B	B	B	B	B	C	D	A
HCM 95th-tile Q	0	0.5	0	2	0.1	4.4	6.3	0.2

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	42	119	48	74	132	13	66	84	69	13	88	25
Future Vol, veh/h	42	119	48	74	132	13	66	84	69	13	88	25
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.83	0.83	0.83	0.82	0.82	0.82
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	48	135	55	84	150	15	80	101	83	16	107	30
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11.1	10.9	12.2	10.6
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	30%	100%	0%	100%	0%	10%
Vol Thru, %	38%	0%	71%	0%	91%	70%
Vol Right, %	32%	0%	29%	0%	9%	20%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	219	42	167	74	145	126
LT Vol	66	42	0	74	0	13
Through Vol	84	0	119	0	132	88
RT Vol	69	0	48	0	13	25
Lane Flow Rate	264	48	190	84	165	154
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.401	0.088	0.313	0.155	0.277	0.243
Departure Headway (Hd)	5.466	6.649	5.936	6.624	6.052	5.698
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	657	538	605	541	593	628
Service Time	3.511	4.397	3.684	4.372	3.799	3.751
HCM Lane V/C Ratio	0.402	0.089	0.314	0.155	0.278	0.245
HCM Control Delay	12.2	10	11.4	10.6	11.1	10.6
HCM Lane LOS	B	A	B	B	B	B
HCM 95th-tile Q	1.9	0.3	1.3	0.5	1.1	0.9

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↱		↰	↱	
Traffic Vol, veh/h	0	5	0	30	6	66	1	312	49	111	195	0
Future Vol, veh/h	0	5	0	30	6	66	1	312	49	111	195	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	80	80	80	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	8	0	38	8	83	1	355	56	126	222	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	905	887	222	863	859	383	222	0	0	411	0	0
Stage 1	474	474	-	385	385	-	-	-	-	-	-	-
Stage 2	431	413	-	478	474	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	256	282	815	274	293	662	1341	-	-	1142	-	-
Stage 1	569	556	-	636	609	-	-	-	-	-	-	-
Stage 2	601	592	-	566	556	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	201	251	815	245	260	662	1341	-	-	1142	-	-
Mov Cap-2 Maneuver	201	251	-	245	260	-	-	-	-	-	-	-
Stage 1	568	495	-	635	608	-	-	-	-	-	-	-
Stage 2	519	591	-	495	495	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.8	17.4	0	3.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1341	-	-	251	416	1142	-	-
HCM Lane V/C Ratio	0.001	-	-	0.032	0.306	0.11	-	-
HCM Control Delay (s)	7.7	-	-	19.8	17.4	8.5	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.3	0.4	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	193	342	66	162	173	71
Future Vol, veh/h	193	342	66	162	173	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	94	94	87	87
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	201	356	70	172	199	82

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	557	0	691	379
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1009	-	409	666
Stage 1	-	-	-	-	690	-
Stage 2	-	-	-	-	740	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1009	-	381	666
Mov Cap-2 Maneuver	-	-	-	-	473	-
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	740	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	473	666	-	-	1009	-
HCM Lane V/C Ratio	0.42	0.123	-	-	0.07	-
HCM Control Delay (s)	18	11.2	-	-	8.8	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	2.1	0.4	-	-	0.2	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	190	76	61	168	60	60
Future Vol, veh/h	190	76	61	168	60	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	85	85
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	202	81	65	179	71	71

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	283	0	552	243
Stage 1	-	-	-	-	243	-
Stage 2	-	-	-	-	309	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1274	-	493	793
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	742	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1274	-	468	793
Mov Cap-2 Maneuver	-	-	-	-	538	-
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	742	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	641	-	-	1274	-
HCM Lane V/C Ratio	0.22	-	-	0.051	-
HCM Control Delay (s)	12.2	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	98	56	0	0	62	0	2	0	0	1	2	101
Future Vol, veh/h	98	56	0	0	62	0	2	0	0	1	2	101
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	86	86	86	25	25	25	61	61	61
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	118	67	0	0	72	0	8	0	0	2	3	166

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	142	106	86	140	189	0	169	0	0	0	0	0
Stage 1	90	90	-	16	16	-	-	-	-	-	-	-
Stage 2	52	16	-	124	173	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	825	782	970	828	704	-	1402	-	-	-	-	-
Stage 1	915	818	-	1001	880	-	-	-	-	-	-	-
Stage 2	958	880	-	878	754	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	777	970	769	700	-	1402	-	-	-	-	-
Mov Cap-2 Maneuver	-	777	-	769	700	-	-	-	-	-	-	-
Stage 1	910	818	-	995	875	-	-	-	-	-	-	-
Stage 2	874	875	-	806	754	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			7.6	
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1402	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.006	-	-	-	-	-	-	-
HCM Control Delay (s)	7.6	0	-	-	-	-	-	-
HCM Lane LOS	A	A	-	-	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-	-	-

CUMULATIVE YEAR 2043
WORKSHEETS

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	52	2	31	53	0	0	77	13	0	45	16
Future Vol, veh/h	26	52	2	31	53	0	0	77	13	0	45	16
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	28	57	2	34	58	0	0	84	14	0	49	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	8.1	7.9	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	33%	37%	0%
Vol Thru, %	86%	65%	63%	74%
Vol Right, %	14%	3%	0%	26%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	80	84	61
LT Vol	0	26	31	0
Through Vol	77	52	53	45
RT Vol	13	2	0	16
Lane Flow Rate	98	87	91	66
Geometry Grp	1	1	1	1
Degree of Util (X)	0.118	0.108	0.114	0.079
Departure Headway (Hd)	4.352	4.474	4.493	4.316
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	827	803	801	832
Service Time	2.365	2.487	2.505	2.331
HCM Lane V/C Ratio	0.119	0.108	0.114	0.079
HCM Control Delay	7.9	8	8.1	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.4	0.4	0.3

Intersection	
Intersection Delay, s/veh	18.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	156	2	16	121	139	3	74	23	368	71	16
Future Vol, veh/h	11	156	2	16	121	139	3	74	23	368	71	16
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	163	2	17	129	148	3	80	25	400	77	17
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	13	15.1	11.4	24.2
HCM LOS	B	C	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	76%	0%	99%	0%	47%	0%	82%
Vol Right, %	0%	24%	0%	1%	0%	53%	0%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	97	11	158	16	260	368	87
LT Vol	3	0	11	0	16	0	368	0
Through Vol	0	74	0	156	0	121	0	71
RT Vol	0	23	0	2	0	139	0	16
Lane Flow Rate	3	105	11	165	17	277	400	95
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.007	0.203	0.024	0.325	0.035	0.492	0.752	0.161
Departure Headway (Hd)	7.606	6.924	7.613	7.098	7.401	6.51	6.769	6.131
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	473	521	473	510	487	556	532	581
Service Time	5.317	4.635	5.319	4.798	5.101	4.21	4.554	3.916
HCM Lane V/C Ratio	0.006	0.202	0.023	0.324	0.035	0.498	0.752	0.164
HCM Control Delay	10.4	11.4	10.5	13.2	10.4	15.4	27.5	10.1
HCM Lane LOS	B	B	B	B	B	C	D	B
HCM 95th-tile Q	0	0.8	0.1	1.4	0.1	2.7	6.5	0.6

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	52	92	31	82	110	26	63	102	92	11	85	52
Future Vol, veh/h	52	92	31	82	110	26	63	102	92	11	85	52
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	57	100	34	89	120	28	68	111	100	12	92	57
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	10.3	10.6	11.9	10.2
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	25%	100%	0%	100%	0%	7%
Vol Thru, %	40%	0%	75%	0%	81%	57%
Vol Right, %	36%	0%	25%	0%	19%	35%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	257	52	123	82	136	148
LT Vol	63	52	0	82	0	11
Through Vol	102	0	92	0	110	85
RT Vol	92	0	31	0	26	52
Lane Flow Rate	279	57	134	89	148	161
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.408	0.104	0.221	0.163	0.243	0.243
Departure Headway (Hd)	5.26	6.644	5.957	6.569	5.925	5.43
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	684	539	602	546	606	660
Service Time	3.297	4.387	3.699	4.309	3.665	3.472
HCM Lane V/C Ratio	0.408	0.106	0.223	0.163	0.244	0.244
HCM Control Delay	11.9	10.2	10.4	10.6	10.6	10.2
HCM Lane LOS	B	B	B	B	B	B
HCM 95th-tile Q	2	0.3	0.8	0.6	0.9	0.9

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	2	32	8	77	2	685	45	73	579	2
Future Vol, veh/h	5	5	2	32	8	77	2	685	45	73	579	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	5	2	35	9	84	2	745	49	79	629	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1608	1586	630	1566	1563	770	631	0	0	794	0	0
Stage 1	788	788	-	774	774	-	-	-	-	-	-	-
Stage 2	820	798	-	792	789	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	84	108	480	90	111	399	947	-	-	823	-	-
Stage 1	383	401	-	390	407	-	-	-	-	-	-	-
Stage 2	368	397	-	381	401	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	57	97	480	79	100	399	947	-	-	823	-	-
Mov Cap-2 Maneuver	57	97	-	79	100	-	-	-	-	-	-	-
Stage 1	382	363	-	389	406	-	-	-	-	-	-	-
Stage 2	284	396	-	338	363	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	55.6	68.4	0	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	947	-	-	84	173	823	-	-
HCM Lane V/C Ratio	0.002	-	-	0.155	0.735	0.096	-	-
HCM Control Delay (s)	8.8	-	-	55.6	68.4	9.8	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	4.6	0.3	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	226	204	51	156	86	48
Future Vol, veh/h	226	204	51	156	86	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	246	222	55	170	93	52

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	468	0	637	357
Stage 1	-	-	-	-	357	-
Stage 2	-	-	-	-	280	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1088	-	440	685
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	765	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1088	-	418	685
Mov Cap-2 Maneuver	-	-	-	-	505	-
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	765	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	505	685	-	-	1088	-
HCM Lane V/C Ratio	0.185	0.076	-	-	0.051	-
HCM Control Delay (s)	13.7	10.7	-	-	8.5	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	203	50	45	203	22	30
Future Vol, veh/h	203	50	45	203	22	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	221	54	49	221	24	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	275	0	567	248
Stage 1	-	-	-	-	248	-
Stage 2	-	-	-	-	319	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1282	-	483	788
Stage 1	-	-	-	-	791	-
Stage 2	-	-	-	-	735	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1282	-	465	788
Mov Cap-2 Maneuver	-	-	-	-	540	-
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	735	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	660	-	-	1282	-
HCM Lane V/C Ratio	0.086	-	-	0.038	-
HCM Control Delay (s)	11	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	84	66	5	0	110	0	2	2	2	0	0	74
Future Vol, veh/h	84	66	5	0	110	0	2	2	2	0	0	74
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	91	72	5	0	120	0	2	2	2	0	0	80

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	107	48	40	86	87	3	80	0	0	4	0	0
Stage 1	40	40	-	7	7	-	-	-	-	-	-	-
Stage 2	67	8	-	79	80	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	870	842	1028	898	801	1078	1512	-	-	1611	-	-
Stage 1	972	860	-	1012	888	-	-	-	-	-	-	-
Stage 2	941	887	-	927	826	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	770	841	1028	834	800	1078	1512	-	-	1611	-	-
Mov Cap-2 Maneuver	770	841	-	834	800	-	-	-	-	-	-	-
Stage 1	971	860	-	1011	887	-	-	-	-	-	-	-
Stage 2	813	886	-	845	826	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	10.3	2.5	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1512	-	-	805	800	1611	-	-
HCM Lane V/C Ratio	0.001	-	-	0.209	0.149	-	-	-
HCM Control Delay (s)	7.4	0	-	10.7	10.3	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0.5	0	-	-

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	32	37	2	26	32	0	0	89	3	2	58	13
Future Vol, veh/h	32	37	2	26	32	0	0	89	3	2	58	13
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	35	40	2	28	35	0	0	97	3	2	63	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	7.9	8	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	45%	45%	3%
Vol Thru, %	97%	52%	55%	79%
Vol Right, %	3%	3%	0%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	92	71	58	73
LT Vol	0	32	26	2
Through Vol	89	37	32	58
RT Vol	3	2	0	13
Lane Flow Rate	100	77	63	79
Geometry Grp	1	1	1	1
Degree of Util (X)	0.121	0.096	0.079	0.094
Departure Headway (Hd)	4.346	4.501	4.533	4.287
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	828	799	793	839
Service Time	2.355	2.512	2.545	2.298
HCM Lane V/C Ratio	0.121	0.096	0.079	0.094
HCM Control Delay	8	8	7.9	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.3	0.3	0.3

Intersection	
Intersection Delay, s/veh	26.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	218	2	15	144	210	3	47	21	381	42	5
Future Vol, veh/h	5	218	2	15	144	210	3	47	21	381	42	5
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	237	2	16	157	228	3	51	23	414	46	5
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	17	23.9	12	36.6
HCM LOS	C	C	B	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	69%	0%	99%	0%	41%	0%	89%
Vol Right, %	0%	31%	0%	1%	0%	59%	0%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	68	5	220	15	354	381	47
LT Vol	3	0	5	0	15	0	381	0
Through Vol	0	47	0	218	0	144	0	42
RT Vol	0	21	0	2	0	210	0	5
Lane Flow Rate	3	74	5	239	16	385	414	51
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.008	0.159	0.012	0.491	0.034	0.714	0.852	0.097
Departure Headway (Hd)	8.466	7.726	7.91	7.39	7.616	6.68	7.404	6.818
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	422	463	452	488	470	539	489	525
Service Time	6.241	5.501	5.671	5.151	5.368	4.432	5.153	4.567
HCM Lane V/C Ratio	0.007	0.16	0.011	0.49	0.034	0.714	0.847	0.097
HCM Control Delay	11.3	12	10.8	17.1	10.6	24.5	39.8	10.3
HCM Lane LOS	B	B	B	C	B	C	E	B
HCM 95th-tile Q	0	0.6	0	2.7	0.1	5.8	8.7	0.3

Intersection	
Intersection Delay, s/veh	11.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	123	66	76	121	19	76	105	76	19	100	18
Future Vol, veh/h	45	123	66	76	121	19	76	105	76	19	100	18
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	49	134	72	83	132	21	83	114	83	21	109	20
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11.4	10.8	12.6	10.7
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	30%	100%	0%	100%	0%	14%
Vol Thru, %	41%	0%	65%	0%	86%	73%
Vol Right, %	30%	0%	35%	0%	14%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	257	45	189	76	140	137
LT Vol	76	45	0	76	0	19
Through Vol	105	0	123	0	121	100
RT Vol	76	0	66	0	19	18
Lane Flow Rate	279	49	205	83	152	149
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.425	0.091	0.337	0.154	0.257	0.239
Departure Headway (Hd)	5.479	6.67	5.913	6.691	6.086	5.785
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	656	537	606	535	589	618
Service Time	3.528	4.419	3.662	4.441	3.835	3.844
HCM Lane V/C Ratio	0.425	0.091	0.338	0.155	0.258	0.241
HCM Control Delay	12.6	10.1	11.7	10.7	10.9	10.7
HCM Lane LOS	B	B	B	B	B	B
HCM 95th-tile Q	2.1	0.3	1.5	0.5	1	0.9

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	8	0	35	10	68	2	473	58	119	295	0
Future Vol, veh/h	0	8	0	35	10	68	2	473	58	119	295	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	9	0	38	11	74	2	514	63	129	321	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1171	1160	321	1134	1129	546	321	0	0	577	0	0
Stage 1	579	579	-	550	550	-	-	-	-	-	-	-
Stage 2	592	581	-	584	579	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	169	195	718	179	203	536	1233	-	-	992	-	-
Stage 1	499	499	-	518	514	-	-	-	-	-	-	-
Stage 2	491	498	-	496	499	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	125	169	718	155	176	536	1233	-	-	992	-	-
Mov Cap-2 Maneuver	125	169	-	155	176	-	-	-	-	-	-	-
Stage 1	498	434	-	517	513	-	-	-	-	-	-	-
Stage 2	414	497	-	423	434	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.5	28.1	0	2.6
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1233	-	-	169	276	992	-	-
HCM Lane V/C Ratio	0.002	-	-	0.051	0.445	0.13	-	-
HCM Control Delay (s)	7.9	-	-	27.5	28.1	9.2	-	-
HCM Lane LOS	A	-	-	D	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	2.2	0.4	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	226	246	45	181	117	57
Future Vol, veh/h	226	246	45	181	117	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	94	94	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	235	256	48	193	127	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	491	0	652	363
Stage 1	-	-	-	-	363	-
Stage 2	-	-	-	-	289	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1067	-	431	680
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	758	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1067	-	412	680
Mov Cap-2 Maneuver	-	-	-	-	502	-
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	758	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	502	680	-	-	1067	-
HCM Lane V/C Ratio	0.253	0.091	-	-	0.045	-
HCM Control Delay (s)	14.6	10.8	-	-	8.5	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	55	40	179	46	46
Future Vol, veh/h	232	55	40	179	46	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	247	59	43	190	50	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	306	0	553	277
Stage 1	-	-	-	-	277	-
Stage 2	-	-	-	-	276	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1249	-	492	759
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1249	-	475	759
Mov Cap-2 Maneuver	-	-	-	-	551	-
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	768	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	638	-	-	1249	-
HCM Lane V/C Ratio	0.157	-	-	0.034	-
HCM Control Delay (s)	11.7	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	92	74	0	0	77	0	3	0	0	2	3	74
Future Vol, veh/h	92	74	0	0	77	0	3	0	0	2	3	74
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	100	80	0	0	84	0	3	0	0	2	3	80

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	95	53	43	93	93	0	83	0	0	0	0	0
Stage 1	47	47	-	6	6	-	-	-	-	-	-	-
Stage 2	48	6	-	87	87	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	886	836	1025	888	795	-	1508	-	-	-	-	-
Stage 1	964	854	-	1013	889	-	-	-	-	-	-	-
Stage 2	963	889	-	918	821	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	834	1025	821	793	-	1508	-	-	-	-	-
Mov Cap-2 Maneuver	-	834	-	821	793	-	-	-	-	-	-	-
Stage 1	962	854	-	1011	887	-	-	-	-	-	-	-
Stage 2	870	887	-	832	821	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			7.4	
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1508	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-	-	-	-	-
HCM Control Delay (s)	7.4	0	-	-	-	-	-	-
HCM Lane LOS	A	A	-	-	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-	-	-

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	52	2	31	53	0	0	107	13	0	89	16
Future Vol, veh/h	26	52	2	31	53	0	0	107	13	0	89	16
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	28	57	2	34	58	0	0	116	14	0	97	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	8.3	8.3	8.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	33%	37%	0%
Vol Thru, %	89%	65%	63%	85%
Vol Right, %	11%	3%	0%	15%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	120	80	84	105
LT Vol	0	26	31	0
Through Vol	107	52	53	89
RT Vol	13	2	0	16
Lane Flow Rate	130	87	91	114
Geometry Grp	1	1	1	1
Degree of Util (X)	0.161	0.113	0.119	0.141
Departure Headway (Hd)	4.444	4.668	4.686	4.436
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	809	768	765	809
Service Time	2.465	2.695	2.713	2.457
HCM Lane V/C Ratio	0.161	0.113	0.119	0.141
HCM Control Delay	8.3	8.3	8.3	8.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.4	0.4	0.5

Intersection	
Intersection Delay, s/veh	38.2
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	191	2	20	141	194	3	74	28	447	71	16
Future Vol, veh/h	11	191	2	20	141	194	3	74	28	447	71	16
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	199	2	21	150	206	3	80	30	486	77	17
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	16.5	24.4	13.1	60.1
HCM LOS	C	C	B	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	73%	0%	99%	0%	42%	0%	82%
Vol Right, %	0%	27%	0%	1%	0%	58%	0%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	102	11	193	20	335	447	87
LT Vol	3	0	11	0	20	0	447	0
Through Vol	0	74	0	191	0	141	0	71
RT Vol	0	28	0	2	0	194	0	16
Lane Flow Rate	3	111	11	201	21	356	486	95
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.008	0.242	0.026	0.441	0.047	0.704	1.005	0.179
Departure Headway (Hd)	8.584	7.868	8.485	7.888	8.036	7.107	7.446	6.804
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	415	455	424	454	445	506	486	526
Service Time	6.373	5.656	6.185	5.661	5.798	4.869	5.203	4.561
HCM Lane V/C Ratio	0.007	0.244	0.026	0.443	0.047	0.704	1	0.181
HCM Control Delay	11.4	13.2	11.4	16.8	11.2	25.2	69.6	11.1
HCM Lane LOS	B	B	B	C	B	D	F	B
HCM 95th-tile Q	0	0.9	0.1	2.2	0.1	5.5	13.6	0.6

Intersection	
Intersection Delay, s/veh	13
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	124	36	103	155	26	77	115	108	11	104	64
Future Vol, veh/h	63	124	36	103	155	26	77	115	108	11	104	64
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	68	135	39	112	168	28	84	125	117	12	113	70
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11.9	12.4	15.1	12
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	26%	100%	0%	100%	0%	6%
Vol Thru, %	38%	0%	78%	0%	86%	58%
Vol Right, %	36%	0%	23%	0%	14%	36%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	300	63	160	103	181	179
LT Vol	77	63	0	103	0	11
Through Vol	115	0	124	0	155	104
RT Vol	108	0	36	0	26	64
Lane Flow Rate	326	68	174	112	197	195
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.523	0.136	0.313	0.219	0.352	0.324
Departure Headway (Hd)	5.77	7.162	6.489	7.045	6.432	6.002
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	620	497	550	506	555	593
Service Time	3.849	4.953	4.28	4.831	4.217	4.097
HCM Lane V/C Ratio	0.526	0.137	0.316	0.221	0.355	0.329
HCM Control Delay	15.1	11.1	12.2	11.8	12.7	12
HCM Lane LOS	C	B	B	B	B	B
HCM 95th-tile Q	3	0.5	1.3	0.8	1.6	1.4

Intersection	
Int Delay, s/veh	10.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↱		↰	↱	
Traffic Vol, veh/h	5	5	2	37	8	92	2	685	54	99	579	2
Future Vol, veh/h	5	5	2	37	8	92	2	685	54	99	579	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	5	2	40	9	100	2	745	59	108	629	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1679	1654	630	1629	1626	775	631	0	0	804	0	0
Stage 1	846	846	-	779	779	-	-	-	-	-	-	-
Stage 2	833	808	-	850	847	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	75	98	480	81	102	396	947	-	-	816	-	-
Stage 1	356	377	-	387	405	-	-	-	-	-	-	-
Stage 2	362	393	-	354	377	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	47	85	480	69	88	396	947	-	-	816	-	-
Mov Cap-2 Maneuver	47	85	-	69	88	-	-	-	-	-	-	-
Stage 1	355	327	-	386	404	-	-	-	-	-	-	-
Stage 2	264	392	-	301	327	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	66.8	112.1	0	1.5
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	947	-	-	71	159	816	-	-
HCM Lane V/C Ratio	0.002	-	-	0.184	0.937	0.132	-	-
HCM Control Delay (s)	8.8	-	-	66.8	112.1	10.1	-	-
HCM Lane LOS	A	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	6.9	0.5	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	266	282	68	194	128	59
Future Vol, veh/h	266	282	68	194	128	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	289	307	74	211	139	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	596	0	802	443
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	976	-	352	613
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	976	-	325	613
Mov Cap-2 Maneuver	-	-	-	-	428	-
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	704	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	15.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	428	613	-	-	976	-
HCM Lane V/C Ratio	0.325	0.105	-	-	0.076	-
HCM Control Delay (s)	17.4	11.6	-	-	9	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.4	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	237	67	62	247	33	41
Future Vol, veh/h	237	67	62	247	33	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	258	73	67	268	36	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	331	0	697	295
Stage 1	-	-	-	-	295	-
Stage 2	-	-	-	-	402	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1223	-	406	742
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	673	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1223	-	384	742
Mov Cap-2 Maneuver	-	-	-	-	471	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	673	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	590	-	-	1223	-
HCM Lane V/C Ratio	0.136	-	-	0.055	-
HCM Control Delay (s)	12.1	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	114	71	5	0	119	0	2	2	2	0	0	118
Future Vol, veh/h	114	71	5	0	119	0	2	2	2	0	0	118
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	124	77	5	0	129	0	2	2	2	0	0	128

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	136	72	64	112	135	3	128	0	0	4	0	0
Stage 1	64	64	-	7	7	-	-	-	-	-	-	-
Stage 2	72	8	-	105	128	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	833	817	998	863	754	1078	1452	-	-	1611	-	-
Stage 1	944	840	-	1012	888	-	-	-	-	-	-	-
Stage 2	935	887	-	898	788	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	722	816	998	796	753	1078	1452	-	-	1611	-	-
Mov Cap-2 Maneuver	722	816	-	796	753	-	-	-	-	-	-	-
Stage 1	943	840	-	1011	887	-	-	-	-	-	-	-
Stage 2	798	886	-	811	788	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.5	10.8	2.5	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1452	-	-	760	753	1611	-	-
HCM Lane V/C Ratio	0.001	-	-	0.272	0.172	-	-	-
HCM Control Delay (s)	7.5	0	-	11.5	10.8	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.1	0.6	0	-	-

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	37	2	26	32	0	0	126	3	2	110	13
Future Vol, veh/h	32	37	2	26	32	0	0	126	3	2	110	13
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	35	40	2	28	35	0	0	137	3	2	120	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	8.2	8.4	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	45%	45%	2%
Vol Thru, %	98%	52%	55%	88%
Vol Right, %	2%	3%	0%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	129	71	58	125
LT Vol	0	32	26	2
Through Vol	126	37	32	110
RT Vol	3	2	0	13
Lane Flow Rate	140	77	63	136
Geometry Grp	1	1	1	1
Degree of Util (X)	0.172	0.101	0.083	0.166
Departure Headway (Hd)	4.428	4.728	4.762	4.388
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	812	759	753	819
Service Time	2.445	2.751	2.786	2.405
HCM Lane V/C Ratio	0.172	0.101	0.084	0.166
HCM Control Delay	8.4	8.3	8.2	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.3	0.3	0.6

Intersection	
Intersection Delay, s/veh	69.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	261	2	19	172	277	3	47	26	474	42	5
Future Vol, veh/h	5	261	2	19	172	277	3	47	26	474	42	5
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	284	2	21	187	301	3	51	28	515	46	5
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	24.5	57.2	13.9	112.6
HCM LOS	C	F	B	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	64%	0%	99%	0%	38%	0%	89%
Vol Right, %	0%	36%	0%	1%	0%	62%	0%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	73	5	263	19	449	474	47
LT Vol	3	0	5	0	19	0	474	0
Through Vol	0	47	0	261	0	172	0	42
RT Vol	0	26	0	2	0	277	0	5
Lane Flow Rate	3	79	5	286	21	488	515	51
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.009	0.191	0.013	0.629	0.046	0.959	1.164	0.107
Departure Headway (Hd)	9.901	9.115	9.084	8.559	8.574	7.613	8.132	7.542
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	364	396	396	426	420	478	448	478
Service Time	7.601	6.815	6.784	6.259	6.274	5.313	5.839	5.249
HCM Lane V/C Ratio	0.008	0.199	0.013	0.671	0.05	1.021	1.15	0.107
HCM Control Delay	12.7	14	11.9	24.7	11.7	59.1	122.7	11.2
HCM Lane LOS	B	B	B	C	B	F	F	B
HCM 95th-tile Q	0	0.7	0	4.2	0.1	11.9	19.1	0.4

Intersection	
Intersection Delay, s/veh	14.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	161	70	100	173	19	92	120	95	19	122	31
Future Vol, veh/h	57	161	70	100	173	19	92	120	95	19	122	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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	62	175	76	109	188	21	100	130	103	21	133	34
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	14.3	13.4	17.2	13
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	30%	100%	0%	100%	0%	11%
Vol Thru, %	39%	0%	70%	0%	90%	71%
Vol Right, %	31%	0%	30%	0%	10%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	307	57	231	100	192	172
LT Vol	92	57	0	100	0	19
Through Vol	120	0	161	0	173	122
RT Vol	95	0	70	0	19	31
Lane Flow Rate	334	62	251	109	209	187
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.573	0.127	0.465	0.223	0.394	0.342
Departure Headway (Hd)	6.187	7.399	6.669	7.389	6.805	6.587
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	584	485	540	486	528	546
Service Time	4.226	5.143	4.413	5.135	4.551	4.634
HCM Lane V/C Ratio	0.572	0.128	0.465	0.224	0.396	0.342
HCM Control Delay	17.2	11.2	15.1	12.3	13.9	13
HCM Lane LOS	C	B	C	B	B	B
HCM 95th-tile Q	3.6	0.4	2.4	0.8	1.9	1.5

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	8	0	42	10	89	2	473	69	151	295	0
Future Vol, veh/h	0	8	0	42	10	89	2	473	69	151	295	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	9	0	46	11	97	2	514	75	164	321	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1259	1242	321	1210	1205	552	321	0	0	589	0	0
Stage 1	649	649	-	556	556	-	-	-	-	-	-	-
Stage 2	610	593	-	654	649	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	147	174	718	159	183	531	1233	-	-	981	-	-
Stage 1	457	464	-	514	511	-	-	-	-	-	-	-
Stage 2	480	492	-	454	464	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	99	145	718	132	152	531	1233	-	-	981	-	-
Mov Cap-2 Maneuver	99	145	-	132	152	-	-	-	-	-	-	-
Stage 1	456	387	-	513	510	-	-	-	-	-	-	-
Stage 2	384	491	-	370	387	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.4	38	0	3.2
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1233	-	-	145	256	981	-	-
HCM Lane V/C Ratio	0.002	-	-	0.06	0.599	0.167	-	-
HCM Control Delay (s)	7.9	-	-	31.4	38	9.4	-	-
HCM Lane LOS	A	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	3.5	0.6	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	270	342	66	224	173	71
Future Vol, veh/h	270	342	66	224	173	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	94	94	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	281	356	70	238	188	77

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	637	0	837	459
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	378	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	942	-	335	600
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	691	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	942	-	310	600
Mov Cap-2 Maneuver	-	-	-	-	417	-
Stage 1	-	-	-	-	587	-
Stage 2	-	-	-	-	691	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	417	600	-	-	942	-
HCM Lane V/C Ratio	0.451	0.129	-	-	0.075	-
HCM Control Delay (s)	20.5	11.9	-	-	9.1	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	2.3	0.4	-	-	0.2	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	269	76	61	229	60	60
Future Vol, veh/h	269	76	61	229	60	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	286	81	65	244	65	65

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	367	0	701	327
Stage 1	-	-	-	-	327	-
Stage 2	-	-	-	-	374	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1186	-	403	712
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	693	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1186	-	381	712
Mov Cap-2 Maneuver	-	-	-	-	473	-
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	693	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	568	-	-	1186	-
HCM Lane V/C Ratio	0.23	-	-	0.055	-
HCM Control Delay (s)	13.2	-	-	8.2	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.9	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	129	81	0	0	88	0	3	0	0	2	3	126
Future Vol, veh/h	129	81	0	0	88	0	3	0	0	2	3	126
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	140	88	0	0	96	0	3	0	0	2	3	137

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	130	82	72	126	150	0	140	0	0	0	0	0
Stage 1	76	76	-	6	6	-	-	-	-	-	-	-
Stage 2	54	6	-	120	144	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	840	806	987	845	740	-	1437	-	-	-	-	-
Stage 1	931	830	-	1013	889	-	-	-	-	-	-	-
Stage 2	956	889	-	882	776	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	804	987	773	739	-	1437	-	-	-	-	-
Mov Cap-2 Maneuver	-	804	-	773	739	-	-	-	-	-	-	-
Stage 1	929	830	-	1011	887	-	-	-	-	-	-	-
Stage 2	851	887	-	788	776	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			7.5	
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1437	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-	-	-	-	-
HCM Control Delay (s)	7.5	0	-	-	-	-	-	-
HCM Lane LOS	A	A	-	-	-	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-	-	-

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	52	2	31	53	0	0	106	13	0	187	16
Future Vol, veh/h	26	52	2	31	53	0	0	106	13	0	187	16
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	28	57	2	34	58	0	0	115	14	0	203	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	8.7	8.5	9.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	33%	37%	0%
Vol Thru, %	89%	65%	63%	92%
Vol Right, %	11%	3%	0%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	119	80	84	203
LT Vol	0	26	31	0
Through Vol	106	52	53	187
RT Vol	13	2	0	16
Lane Flow Rate	129	87	91	221
Geometry Grp	1	1	1	1
Degree of Util (X)	0.165	0.119	0.125	0.276
Departure Headway (Hd)	4.581	4.924	4.942	4.498
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	781	726	723	799
Service Time	2.616	2.968	2.986	2.529
HCM Lane V/C Ratio	0.165	0.12	0.126	0.277
HCM Control Delay	8.5	8.6	8.7	9.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.4	0.4	1.1

Intersection	
Intersection Delay, s/veh	116.3
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	289	2	20	141	192	3	74	28	619	71	16
Future Vol, veh/h	11	289	2	20	141	192	3	74	28	619	71	16
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	301	2	21	150	204	3	80	30	673	77	17
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	26.4	28.6	14.7	211.2
HCM LOS	D	D	B	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	73%	0%	99%	0%	42%	0%	82%
Vol Right, %	0%	27%	0%	1%	0%	58%	0%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	102	11	291	20	333	619	87
LT Vol	3	0	11	0	20	0	619	0
Through Vol	0	74	0	289	0	141	0	71
RT Vol	0	28	0	2	0	192	0	16
Lane Flow Rate	3	111	11	303	21	354	673	95
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.008	0.252	0.026	0.655	0.048	0.717	1.458	0.188
Departure Headway (Hd)	9.814	9.088	9.413	8.888	9.298	8.359	7.799	7.154
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	367	398	383	409	387	436	464	498
Service Time	7.514	6.788	7.113	6.588	6.998	6.059	5.595	4.95
HCM Lane V/C Ratio	0.008	0.279	0.029	0.741	0.054	0.812	1.45	0.191
HCM Control Delay	12.6	14.8	12.4	26.9	12.5	29.6	239.3	11.6
HCM Lane LOS	B	B	B	D	B	D	F	B
HCM 95th-tile Q	0	1	0.1	4.5	0.2	5.6	33.5	0.7

Intersection	
Intersection Delay, s/veh	15.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	123	36	204	177	26	77	115	108	11	143	74
Future Vol, veh/h	63	123	36	204	177	26	77	115	108	11	143	74
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	68	134	39	222	192	28	84	125	117	12	155	80
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	13.3	15.7	18.3	15.3
HCM LOS	B	C	C	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	26%	100%	0%	100%	0%	5%
Vol Thru, %	38%	0%	77%	0%	87%	63%
Vol Right, %	36%	0%	23%	0%	13%	32%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	300	63	159	204	203	228
LT Vol	77	63	0	204	0	11
Through Vol	115	0	123	0	177	143
RT Vol	108	0	36	0	26	74
Lane Flow Rate	326	68	173	222	221	248
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.586	0.15	0.346	0.463	0.423	0.458
Departure Headway (Hd)	6.466	7.895	7.217	7.513	6.908	6.65
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	558	453	498	479	521	540
Service Time	4.519	5.661	4.983	5.272	4.667	4.709
HCM Lane V/C Ratio	0.584	0.15	0.347	0.463	0.424	0.459
HCM Control Delay	18.3	12.1	13.8	16.6	14.7	15.3
HCM Lane LOS	C	B	B	C	B	C
HCM 95th-tile Q	3.8	0.5	1.5	2.4	2.1	2.4

Intersection	
Int Delay, s/veh	21.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↱		↰	↱	
Traffic Vol, veh/h	5	5	2	37	8	92	2	685	78	173	579	2
Future Vol, veh/h	5	5	2	37	8	92	2	685	78	173	579	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	5	2	40	9	100	2	745	85	188	629	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1852	1840	630	1802	1799	788	631	0	0	830	0	0
Stage 1	1006	1006	-	792	792	-	-	-	-	-	-	-
Stage 2	846	834	-	1010	1007	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	56	75	480	61	79	390	947	-	-	798	-	-
Stage 1	289	318	-	381	399	-	-	-	-	-	-	-
Stage 2	356	382	-	288	317	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	30	57	480	46	60	390	947	-	-	798	-	-
Mov Cap-2 Maneuver	30	57	-	46	60	-	-	-	-	-	-	-
Stage 1	288	243	-	380	398	-	-	-	-	-	-	-
Stage 2	258	381	-	214	242	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	111.7	243.4	0	2.5
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	947	-	-	46	117	798	-	-
HCM Lane V/C Ratio	0.002	-	-	0.284	1.273	0.236	-	-
HCM Control Delay (s)	8.8	-	-	111.7	243.4	10.9	-	-
HCM Lane LOS	A	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1	9.7	0.9	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	415	404	84	193	126	58
Future Vol, veh/h	415	404	84	193	126	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	451	439	91	210	137	63

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	890	0	1063	671
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	392	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	757	-	246	455
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	681	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	757	-	216	455
Mov Cap-2 Maneuver	-	-	-	-	327	-
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	681	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	20.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	327	455	-	-	757	-
HCM Lane V/C Ratio	0.419	0.139	-	-	0.121	-
HCM Control Delay (s)	23.7	14.2	-	-	10.4	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	2	0.5	-	-	0.4	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	236	216	78	263	32	40
Future Vol, veh/h	236	216	78	263	32	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	257	235	85	286	35	43

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	492	0	831	375
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	456	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1066	-	338	669
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	636	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1066	-	311	669
Mov Cap-2 Maneuver	-	-	-	-	410	-
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	636	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	522	-	-	1066	-
HCM Lane V/C Ratio	0.15	-	-	0.08	-
HCM Control Delay (s)	13.1	-	-	8.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.3	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	113	71	5	0	143	0	2	2	2	0	0	216
Future Vol, veh/h	113	71	5	0	143	0	2	2	2	0	0	216
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	123	77	5	0	155	0	2	2	2	0	0	235

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	203	126	118	166	242	3	235	0	0	4	0	0
Stage 1	118	118	-	7	7	-	-	-	-	-	-	-
Stage 2	85	8	-	159	235	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	753	763	931	796	658	1078	1326	-	-	1611	-	-
Stage 1	884	796	-	1012	888	-	-	-	-	-	-	-
Stage 2	920	887	-	841	709	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	614	761	931	729	657	1078	1326	-	-	1611	-	-
Mov Cap-2 Maneuver	614	761	-	729	657	-	-	-	-	-	-	-
Stage 1	882	796	-	1010	886	-	-	-	-	-	-	-
Stage 2	757	885	-	755	709	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	12.2	2.6	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1326	-	-	669	657	1611	-	-
HCM Lane V/C Ratio	0.002	-	-	0.307	0.237	-	-	-
HCM Control Delay (s)	7.7	0	-	12.7	12.2	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.3	0.9	0	-	-

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	52	2	31	53	0	0	210	13	0	83	16
Future Vol, veh/h	26	52	2	31	53	0	0	210	13	0	83	16
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	28	57	2	34	58	0	0	228	14	0	90	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	8.7	9.5	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	33%	37%	0%
Vol Thru, %	94%	65%	63%	84%
Vol Right, %	6%	3%	0%	16%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	223	80	84	99
LT Vol	0	26	31	0
Through Vol	210	52	53	83
RT Vol	13	2	0	16
Lane Flow Rate	242	87	91	108
Geometry Grp	1	1	1	1
Degree of Util (X)	0.302	0.119	0.125	0.137
Departure Headway (Hd)	4.485	4.924	4.942	4.574
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	800	726	724	782
Service Time	2.515	2.967	2.984	2.61
HCM Lane V/C Ratio	0.302	0.12	0.126	0.138
HCM Control Delay	9.5	8.6	8.7	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.3	0.4	0.4	0.5

Intersection	
Intersection Delay, s/veh	99.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	185	2	20	245	374	3	74	28	437	71	16
Future Vol, veh/h	11	185	2	20	245	374	3	74	28	437	71	16
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	193	2	21	261	398	3	80	30	475	77	17
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	18.2	160.8	15.2	72.6
HCM LOS	C	F	C	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	73%	0%	99%	0%	40%	0%	82%
Vol Right, %	0%	27%	0%	1%	0%	60%	0%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	102	11	187	20	619	437	87
LT Vol	3	0	11	0	20	0	437	0
Through Vol	0	74	0	185	0	245	0	71
RT Vol	0	28	0	2	0	374	0	16
Lane Flow Rate	3	111	11	195	21	659	475	95
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.008	0.259	0.028	0.444	0.047	1.286	1.041	0.191
Departure Headway (Hd)	10.064	9.337	9.42	8.889	8.202	7.254	8.58	7.932
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	358	387	382	407	439	507	428	455
Service Time	7.764	7.037	7.12	6.589	5.902	4.954	6.28	5.632
HCM Lane V/C Ratio	0.008	0.287	0.029	0.479	0.048	1.3	1.11	0.209
HCM Control Delay	12.8	15.3	12.4	18.5	11.3	165.6	84.6	12.5
HCM Lane LOS	B	C	B	C	B	F	F	B
HCM 95th-tile Q	0	1	0.1	2.2	0.1	26.7	13.9	0.7

Intersection	
Intersection Delay, s/veh	29.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	73	217	36	101	150	26	165	157	144	11	102	64
Future Vol, veh/h	73	217	36	101	150	26	165	157	144	11	102	64
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	79	236	39	110	163	28	179	171	157	12	111	70
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	19.2	15.5	50.3	15.4
HCM LOS	C	C	F	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	35%	100%	0%	100%	0%	6%
Vol Thru, %	34%	0%	86%	0%	85%	58%
Vol Right, %	31%	0%	14%	0%	15%	36%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	466	73	253	101	176	177
LT Vol	165	73	0	101	0	11
Through Vol	157	0	217	0	150	102
RT Vol	144	0	36	0	26	64
Lane Flow Rate	507	79	275	110	191	192
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.937	0.184	0.589	0.259	0.417	0.398
Departure Headway (Hd)	6.66	8.327	7.707	8.478	7.852	7.453
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	547	431	468	424	457	481
Service Time	4.66	6.082	5.461	6.237	5.612	5.515
HCM Lane V/C Ratio	0.927	0.183	0.588	0.259	0.418	0.399
HCM Control Delay	50.3	13	21	14.2	16.2	15.4
HCM Lane LOS	F	B	C	B	C	C
HCM 95th-tile Q	11.8	0.7	3.7	1	2	1.9

Intersection	
Int Delay, s/veh	46.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	2	63	8	170	2	685	52	95	579	2
Future Vol, veh/h	5	5	2	63	8	170	2	685	52	95	579	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	425	-	-	425	-	-
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	5	2	68	9	185	2	745	57	103	629	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1711	1642	630	1618	1615	774	631	0	0	802	0	0
Stage 1	836	836	-	778	778	-	-	-	-	-	-	-
Stage 2	875	806	-	840	837	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	71	99	480	83	103	397	947	-	-	817	-	-
Stage 1	360	381	-	388	405	-	-	-	-	-	-	-
Stage 2	343	393	-	358	381	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	32	86	480	71	90	397	947	-	-	817	-	-
Mov Cap-2 Maneuver	32	86	-	71	90	-	-	-	-	-	-	-
Stage 1	359	333	-	387	404	-	-	-	-	-	-	-
Stage 2	179	392	-	306	333	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	89.7	$ 311.5	0	1.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	947	-	-	55	172	817	-	-
HCM Lane V/C Ratio	0.002	-	-	0.237	1.523	0.126	-	-
HCM Control Delay (s)	8.8	-	-	89.7	$ 311.5	10	-	-
HCM Lane LOS	A	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	17	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	10.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	264	270	66	363	272	110
Future Vol, veh/h	264	270	66	363	272	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	287	293	72	395	296	120

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	580	0	973	434
Stage 1	-	-	-	-	434	-
Stage 2	-	-	-	-	539	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	989	-	~ 278	620
Stage 1	-	-	-	-	651	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	989	-	~ 258	620
Mov Cap-2 Maneuver	-	-	-	-	369	-
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	583	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	35.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	369	620	-	-	989	-
HCM Lane V/C Ratio	0.801	0.193	-	-	0.073	-
HCM Control Delay (s)	44.3	12.2	-	-	8.9	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	6.9	0.7	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	288	65	60	332	115	92
Future Vol, veh/h	288	65	60	332	115	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	313	71	65	361	125	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	384	0	840	349
Stage 1	-	-	-	-	349	-
Stage 2	-	-	-	-	491	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1169	-	334	692
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	613	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1169	-	315	692
Mov Cap-2 Maneuver	-	-	-	-	416	-
Stage 1	-	-	-	-	672	-
Stage 2	-	-	-	-	613	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	17.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	506	-	-	1169	-
HCM Lane V/C Ratio	0.445	-	-	0.056	-
HCM Control Delay (s)	17.7	-	-	8.3	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	10.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	217	97	5	0	117	0	2	2	2	0	0	112
Future Vol, veh/h	217	97	5	0	117	0	2	2	2	0	0	112
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	236	105	5	0	127	0	2	2	2	0	0	122

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	132	69	61	123	129	3	122	0	0	4	0	0
Stage 1	61	61	-	7	7	-	-	-	-	-	-	-
Stage 2	71	8	-	116	122	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	838	820	1001	849	760	1078	1459	-	-	1611	-	-
Stage 1	948	842	-	1012	888	-	-	-	-	-	-	-
Stage 2	936	887	-	886	793	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	730	819	1001	761	759	1078	1459	-	-	1611	-	-
Mov Cap-2 Maneuver	730	819	-	761	759	-	-	-	-	-	-	-
Stage 1	947	842	-	1011	887	-	-	-	-	-	-	-
Stage 2	801	886	-	771	793	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.7	10.7	2.5	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	758	759	1611	-	-
HCM Lane V/C Ratio	0.001	-	-	0.457	0.168	-	-	-
HCM Control Delay (s)	7.5	0	-	13.7	10.7	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.4	0.6	0	-	-

MITIGATION
WORKSHEETS

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	3	1	25	5	63	1	425	37	71	359	1
Future Vol, veh/h	3	3	1	25	5	63	1	425	37	71	359	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	425	-	-	425	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	76	76	76	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	5	2	33	7	83	1	500	44	84	422	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1160	1137	423	1118	1115	522	423	0	0	544	0	0
Stage 1	591	591	-	524	524	-	-	-	-	-	-	-
Stage 2	569	546	-	594	591	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	172	201	629	183	207	553	1131	-	-	1020	-	-
Stage 1	492	493	-	535	528	-	-	-	-	-	-	-
Stage 2	505	516	-	490	493	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	133	184	629	167	190	553	1131	-	-	1020	-	-
Mov Cap-2 Maneuver	133	184	-	167	190	-	-	-	-	-	-	-
Stage 1	492	453	-	534	527	-	-	-	-	-	-	-
Stage 2	424	515	-	443	453	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.4	18.9	0	1.5
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1131	-	-	173	167	485	1020	-	-
HCM Lane V/C Ratio	0.001	-	-	0.07	0.197	0.184	0.082	-	-
HCM Control Delay (s)	8.2	-	-	27.4	31.8	14.1	8.8	-	-
HCM Lane LOS	A	-	-	D	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.7	0.7	0.3	-	-

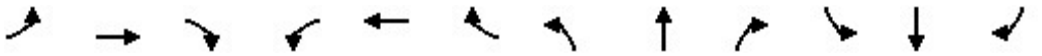
Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	0	29	6	63	1	293	47	106	183	0
Future Vol, veh/h	0	5	0	29	6	63	1	293	47	106	183	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	425	-	-	425	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	80	80	80	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	8	0	36	8	79	1	333	53	120	208	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	853	836	208	814	810	360	208	0	0	386	0	0
Stage 1	448	448	-	362	362	-	-	-	-	-	-	-
Stage 2	405	388	-	452	448	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	278	302	830	295	313	682	1357	-	-	1167	-	-
Stage 1	588	571	-	655	623	-	-	-	-	-	-	-
Stage 2	620	607	-	585	571	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	222	271	830	266	280	682	1357	-	-	1167	-	-
Mov Cap-2 Maneuver	222	271	-	266	280	-	-	-	-	-	-	-
Stage 1	587	512	-	654	622	-	-	-	-	-	-	-
Stage 2	541	606	-	517	512	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.7	14.5	0	3.1
HCM LOS	C	B		

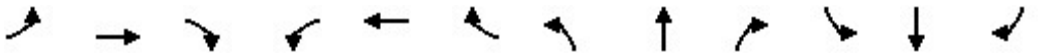
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1357	-	-	271	266	606	1167	-	-
HCM Lane V/C Ratio	0.001	-	-	0.029	0.136	0.142	0.103	-	-
HCM Control Delay (s)	7.7	-	-	18.7	20.7	11.9	8.4	-	-
HCM Lane LOS	A	-	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0.5	0.3	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	3	1	26	5	66	1	452	39	74	382	1
Future Volume (veh/h)	3	3	1	26	5	66	1	452	39	74	382	1
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	5	2	34	7	87	1	532	46	87	449	1
Peak Hour Factor	0.58	0.58	0.58	0.76	0.76	0.76	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	195	110	32	169	16	117	5	712	62	144	931	2
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.00	0.42	0.42	0.08	0.50	0.50
Sat Flow, veh/h	447	995	289	352	145	1054	1767	1684	146	1767	1851	4
Grp Volume(v), veh/h	12	0	0	128	0	0	1	0	578	87	0	450
Grp Sat Flow(s),veh/h/ln	1731	0	0	1551	0	0	1767	0	1829	1767	0	1855
Q Serve(g_s), s	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	9.4	1.7	0.0	5.6
Cycle Q Clear(g_c), s	0.2	0.0	0.0	2.8	0.0	0.0	0.0	0.0	9.4	1.7	0.0	5.6
Prop In Lane	0.42		0.17	0.27		0.68	1.00		0.08	1.00		0.00
Lane Grp Cap(c), veh/h	337	0	0	302	0	0	5	0	774	144	0	933
V/C Ratio(X)	0.04	0.00	0.00	0.42	0.00	0.00	0.20	0.00	0.75	0.60	0.00	0.48
Avail Cap(c_a), veh/h	975	0	0	941	0	0	277	0	2424	579	0	2775
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	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.0	0.0	0.0	15.1	0.0	0.0	17.5	0.0	8.5	15.6	0.0	5.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.9	0.0	0.0	18.2	0.0	1.5	4.0	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	0.1	0.0	0.0	0.7	0.0	0.0	0.0	0.0	1.7	0.6	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	0.0	0.0	16.0	0.0	0.0	35.7	0.0	10.0	19.6	0.0	6.1
LnGrp LOS	B	A	A	B	A	A	D	A	B	B	A	A
Approach Vol, veh/h		12			128			579			537	
Approach Delay, s/veh		14.0			16.0			10.1			8.3	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.4	19.3		8.4	4.5	22.1		8.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	11.5	46.5		18.5	5.5	52.5		18.5				
Max Q Clear Time (g_c+I1), s	3.7	11.4		2.2	2.0	7.6		4.8				
Green Ext Time (p_c), s	0.1	3.5		0.0	0.0	2.5		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			9.9									
HCM 6th LOS			A									



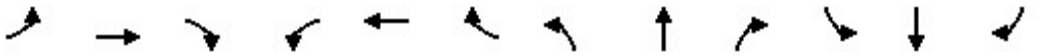
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	5	0	30	6	66	1	312	49	111	195	0
Future Volume (veh/h)	0	5	0	30	6	66	1	312	49	111	195	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	0	8	0	38	8	82	1	355	56	126	222	0
Peak Hour Factor	0.63	0.63	0.63	0.80	0.80	0.80	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	0	209	0	201	15	111	6	524	83	190	819	0
Arrive On Green	0.00	0.11	0.00	0.11	0.11	0.11	0.00	0.34	0.34	0.11	0.44	0.00
Sat Flow, veh/h	0	1856	0	422	131	986	1767	1564	247	1767	1856	0
Grp Volume(v), veh/h	0	8	0	128	0	0	1	0	411	126	222	0
Grp Sat Flow(s),veh/h/ln	0	1856	0	1539	0	0	1767	0	1811	1767	1856	0
Q Serve(g_s), s	0.0	0.1	0.0	2.2	0.0	0.0	0.0	0.0	5.9	2.1	2.3	0.0
Cycle Q Clear(g_c), s	0.0	0.1	0.0	2.4	0.0	0.0	0.0	0.0	5.9	2.1	2.3	0.0
Prop In Lane	0.00		0.00	0.30		0.64	1.00		0.14	1.00		0.00
Lane Grp Cap(c), veh/h	0	209	0	327	0	0	6	0	607	190	819	0
V/C Ratio(X)	0.00	0.04	0.00	0.39	0.00	0.00	0.17	0.00	0.68	0.66	0.27	0.00
Avail Cap(c_a), veh/h	0	1253	0	1188	0	0	320	0	2357	961	3087	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)	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	12.0	0.0	13.0	0.0	0.0	15.1	0.0	8.7	13.0	5.4	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.8	0.0	0.0	13.4	0.0	1.3	3.9	0.2	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	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	1.1	0.7	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.1	0.0	13.8	0.0	0.0	28.5	0.0	10.0	16.9	5.6	0.0
LnGrp LOS	A	B	A	B	A	A	C	A	B	B	A	A
Approach Vol, veh/h		8			128			412			348	
Approach Delay, s/veh		12.1			13.8			10.1			9.7	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	14.7		7.9	4.5	17.9		7.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	16.5	39.5		20.5	5.5	50.5		20.5				
Max Q Clear Time (g_c+I1), s	4.1	7.9		2.1	2.0	4.3		4.4				
Green Ext Time (p_c), s	0.2	2.2		0.0	0.0	1.1		0.5				

Intersection Summary			
HCM 6th Ctrl Delay		10.5	
HCM 6th LOS		B	

HCM 6th Signalized Intersection Summary
2: SR 41 & Jersey Avenue

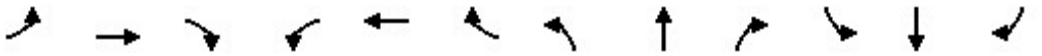
03/26/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	2	37	8	92	2	685	54	99	579	2
Future Volume (veh/h)	5	5	2	37	8	92	2	685	54	99	579	2
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	5	2	40	9	100	2	745	59	108	629	2
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	159	125	36	132	25	132	5	888	70	139	1109	4
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.00	0.52	0.52	0.08	0.60	0.60
Sat Flow, veh/h	447	995	288	316	198	1049	1767	1697	134	1767	1849	6
Grp Volume(v), veh/h	12	0	0	149	0	0	2	0	804	108	0	631
Grp Sat Flow(s),veh/h/ln	1730	0	0	1563	0	0	1767	0	1831	1767	0	1854
Q Serve(g_s), s	0.0	0.0	0.0	3.1	0.0	0.0	0.1	0.0	18.5	3.0	0.0	10.3
Cycle Q Clear(g_c), s	0.3	0.0	0.0	4.5	0.0	0.0	0.1	0.0	18.5	3.0	0.0	10.3
Prop In Lane	0.42		0.17	0.27		0.67	1.00		0.07	1.00		0.00
Lane Grp Cap(c), veh/h	320	0	0	289	0	0	5	0	959	139	0	1112
V/C Ratio(X)	0.04	0.00	0.00	0.52	0.00	0.00	0.41	0.00	0.84	0.77	0.00	0.57
Avail Cap(c_a), veh/h	683	0	0	655	0	0	181	0	1802	338	0	1989
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	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	0.0	20.9	0.0	0.0	24.7	0.0	10.1	22.5	0.0	6.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.4	0.0	0.0	47.9	0.0	2.0	8.8	0.0	0.5
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	0.1	0.0	0.0	1.4	0.0	0.0	0.1	0.0	4.2	1.3	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.2	0.0	0.0	22.4	0.0	0.0	72.6	0.0	12.1	31.3	0.0	6.5
LnGrp LOS	B	A	A	C	A	A	E	A	B	C	A	A
Approach Vol, veh/h		12			149			806			739	
Approach Delay, s/veh		19.2			22.4			12.3			10.1	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	30.5		10.8	4.6	34.3		10.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	48.9		18.1	5.1	53.3		18.1				
Max Q Clear Time (g_c+I1), s	5.0	20.5		2.3	2.1	12.3		6.5				
Green Ext Time (p_c), s	0.1	5.5		0.0	0.0	3.9		0.5				

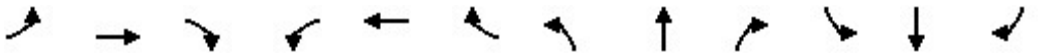
Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	8	0	42	10	89	2	473	69	151	295	0
Future Volume (veh/h)	0	8	0	42	10	89	2	473	69	151	295	0
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	0	9	0	46	11	97	2	514	75	164	321	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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	0	244	0	163	27	129	5	658	96	217	994	0
Arrive On Green	0.00	0.13	0.00	0.13	0.13	0.13	0.00	0.42	0.42	0.12	0.54	0.00
Sat Flow, veh/h	0	1856	0	369	207	981	1767	1583	231	1767	1856	0
Grp Volume(v), veh/h	0	9	0	154	0	0	2	0	589	164	321	0
Grp Sat Flow(s),veh/h/ln	0	1856	0	1557	0	0	1767	0	1814	1767	1856	0
Q Serve(g_s), s	0.0	0.2	0.0	2.8	0.0	0.0	0.0	0.0	11.5	3.7	4.0	0.0
Cycle Q Clear(g_c), s	0.0	0.2	0.0	3.9	0.0	0.0	0.0	0.0	11.5	3.7	4.0	0.0
Prop In Lane	0.00		0.00	0.30		0.63	1.00		0.13	1.00		0.00
Lane Grp Cap(c), veh/h	0	244	0	319	0	0	5	0	754	217	994	0
V/C Ratio(X)	0.00	0.04	0.00	0.48	0.00	0.00	0.41	0.00	0.78	0.76	0.32	0.00
Avail Cap(c_a), veh/h	0	830	0	802	0	0	220	0	1893	669	2408	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)	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	15.5	0.0	17.1	0.0	0.0	20.4	0.0	10.3	17.4	5.3	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	1.1	0.0	0.0	47.6	0.0	1.8	5.3	0.2	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	0.0	0.1	0.0	1.1	0.0	0.0	0.1	0.0	2.7	1.4	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	15.6	0.0	18.2	0.0	0.0	68.0	0.0	12.1	22.7	5.5	0.0
LnGrp LOS	A	B	A	B	A	A	E	A	B	C	A	A
Approach Vol, veh/h		9			154			591			485	
Approach Delay, s/veh		15.6			18.2			12.3			11.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	21.5		9.9	4.6	26.4		9.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	15.5	42.7		18.3	5.1	53.1		18.3				
Max Q Clear Time (g_c+I1), s	5.7	13.5		2.2	2.0	6.0		5.9				
Green Ext Time (p_c), s	0.3	3.5		0.0	0.0	1.7		0.5				

Intersection Summary		
HCM 6th Ctrl Delay		12.7
HCM 6th LOS		B



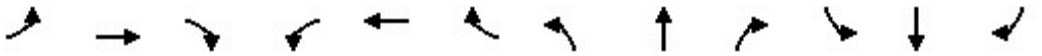
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	191	2	20	141	194	3	74	28	447	71	16
Future Volume (veh/h)	11	191	2	20	141	194	3	74	28	447	71	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	199	2	21	150	206	3	80	30	486	77	17
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	25	441	4	44	178	244	7	130	49	558	607	134
Arrive On Green	0.01	0.24	0.24	0.02	0.25	0.25	0.00	0.10	0.10	0.32	0.41	0.41
Sat Flow, veh/h	1767	1834	18	1767	708	972	1767	1286	482	1767	1472	325
Grp Volume(v), veh/h	11	0	201	21	0	356	3	0	110	486	0	94
Grp Sat Flow(s),veh/h/ln	1767	0	1852	1767	0	1681	1767	0	1769	1767	0	1797
Q Serve(g_s), s	0.3	0.0	5.2	0.7	0.0	11.4	0.1	0.0	3.4	14.7	0.0	1.8
Cycle Q Clear(g_c), s	0.3	0.0	5.2	0.7	0.0	11.4	0.1	0.0	3.4	14.7	0.0	1.8
Prop In Lane	1.00		0.01	1.00		0.58	1.00		0.27	1.00		0.18
Lane Grp Cap(c), veh/h	25	0	446	44	0	422	7	0	179	558	0	742
V/C Ratio(X)	0.44	0.00	0.45	0.48	0.00	0.84	0.42	0.00	0.62	0.87	0.00	0.13
Avail Cap(c_a), veh/h	156	0	595	165	0	549	156	0	625	889	0	1380
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	0.0	18.3	27.3	0.0	20.1	28.1	0.0	24.4	18.3	0.0	10.3
Incr Delay (d2), s/veh	11.9	0.0	0.7	7.9	0.0	9.1	34.2	0.0	3.4	5.7	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	0.2	0.0	1.9	0.3	0.0	4.6	0.1	0.0	1.4	5.4	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.6	0.0	19.0	35.1	0.0	29.2	62.4	0.0	27.8	24.0	0.0	10.4
LnGrp LOS	D	A	B	D	A	C	E	A	C	C	A	B
Approach Vol, veh/h		212			377			113			580	
Approach Delay, s/veh		20.1			29.5			28.7			21.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.4	10.2	5.9	18.1	4.7	27.9	5.3	18.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	28.5	20.0	5.3	18.2	5.0	43.5	5.0	18.5
Max Q Clear Time (g_c+I1), s	16.7	5.4	2.7	7.2	2.1	3.8	2.3	13.4
Green Ext Time (p_c), s	1.2	0.3	0.0	0.6	0.0	0.4	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	24.4
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
3: 18th Avenue & Jersey Avenue

03/26/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	261	2	19	172	277	3	47	26	474	42	5
Future Volume (veh/h)	5	261	2	19	172	277	3	47	26	474	42	5
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	284	2	21	187	301	3	51	28	515	46	5
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	12	555	4	43	204	329	7	87	48	571	652	71
Arrive On Green	0.01	0.30	0.30	0.02	0.32	0.32	0.00	0.08	0.08	0.32	0.40	0.40
Sat Flow, veh/h	1767	1840	13	1767	640	1030	1767	1126	618	1767	1645	179
Grp Volume(v), veh/h	5	0	286	21	0	488	3	0	79	515	0	51
Grp Sat Flow(s),veh/h/ln	1767	0	1853	1767	0	1670	1767	0	1744	1767	0	1823
Q Serve(g_s), s	0.2	0.0	8.4	0.8	0.0	18.5	0.1	0.0	2.9	18.3	0.0	1.1
Cycle Q Clear(g_c), s	0.2	0.0	8.4	0.8	0.0	18.5	0.1	0.0	2.9	18.3	0.0	1.1
Prop In Lane	1.00		0.01	1.00		0.62	1.00		0.35	1.00		0.10
Lane Grp Cap(c), veh/h	12	0	558	43	0	533	7	0	135	571	0	723
V/C Ratio(X)	0.43	0.00	0.51	0.49	0.00	0.92	0.42	0.00	0.59	0.90	0.00	0.07
Avail Cap(c_a), veh/h	135	0	624	135	0	562	135	0	489	713	0	1108
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	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.5	0.0	19.0	31.6	0.0	21.5	32.6	0.0	29.3	21.2	0.0	12.3
Incr Delay (d2), s/veh	22.6	0.0	0.7	8.4	0.0	19.4	34.5	0.0	4.0	12.8	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	0.1	0.0	3.1	0.4	0.0	8.7	0.1	0.0	1.2	8.1	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.1	0.0	19.7	40.1	0.0	40.9	67.2	0.0	33.3	34.0	0.0	12.4
LnGrp LOS	E	A	B	D	A	D	E	A	C	C	A	B
Approach Vol, veh/h		291			509			82			566	
Approach Delay, s/veh		20.3			40.9			34.5			32.0	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.7	9.6	6.1	24.3	4.8	30.5	4.9	25.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	26.5	18.4	5.0	22.1	5.0	39.9	5.0	22.1
Max Q Clear Time (g_c+I1), s	20.3	4.9	2.8	10.4	2.1	3.1	2.2	20.5
Green Ext Time (p_c), s	0.9	0.2	0.0	1.0	0.0	0.2	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	32.9
HCM 6th LOS	C

APPENDIX D

Chapter 400 of Caltrans' Highway Design Manual

CHAPTER 400
INTERSECTIONS AT GRADE

Intersections are planned points of conflict where two or more roadways join or cross. At-grade intersections are among the most complicated elements on the highway system, and control the efficiency, capacity, and safety for motorized and non-motorized users of the facility. The type and operation of an intersection is important to the adjacent property owners, motorists, bicyclists, pedestrians, transit operators, the trucking industry, and the local community.

There are two basic types of at grade intersections: crossing and circular. It is not recommended that intersections have more than four legs. Occasionally, local development and land uses create the need for a more complex intersection design. Such intersections may require a specialized intersection design to handle the specify traffic demands at that location. In addition to the guidance in this manual, see Traffic Operations Policy Directive (TOPD) Number 13-02: Intersection Control Evaluation (ICE) for direction and procedures on the evaluation, comparison and selection of the intersection types and control strategies identified in Index 401.5. Also refer to the Complete Streets Intersection Guide for further information.

Topic 401 - Factors Affecting Design

Index 401.1 - General

At-grade intersections must handle a variety of conflicts among users, which includes truck, transit, pedestrians, and bicycles. These recurring conflicts play a major role in the preparation of design standards and guidelines. Arriving, departing, merging, turning, and crossing paths of moving pedestrians, bicycles, truck, and vehicular traffic have to be accommodated within a relatively small area. The objective of designing an intersection is to effectively balance the convenience, ease, and comfort of the users, as well as the human factors, with moving traffic (automobiles, trucks, motorcycles, transit vehicles, bicycles, pedestrians, etc.).The safety and mobility needs of motorist, bicyclist and pedestrians as well as their movement patterns in intersections must be analyzed early in the planning phase and then followed through appropriately during the design phase of all intersections on the State highway. It is Departmental policy to develop integrated multimodal projects in balance with community goals, plans, and values.

The Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians contains a primer on the factors to consider when designing intersections. It is published by the California Division of Traffic Operations.

401.2 Human Factors

(1) The Driver. An appreciation of driver performance is essential to proper highway design and operation. The suitability of a design rests as much on how safely and efficiently drivers are able to use the highway as on any other criterion.

Motorist's perception and reaction time set the standards for sight distance and length of transitions. The driver's ability to understand and interpret the movements and crossing times of the other vehicle drivers, bicyclists, and pedestrians using the intersection is equally important when making decisions and their associated reactions. The designer needs to keep in mind the user's limitations and therefore design intersections so that they meet user expectation.

(2) The Bicyclist. Bicyclist experience, skills and physical capabilities are factors in intersection design. Intersections are to be designed to help bicyclists understand how to traverse the intersection. Chapter 1000 provides intersection guidance for Class I and Class III bikeways that intersect the State highway system. The guidance in this chapter specifically relates to bicyclists that operate within intersections on the State highway system.

(3) The Pedestrian. Understanding how pedestrians will use an intersection is critical because pedestrian volumes, their age ranges, physical ability, etc. all factor in to their startup time and the time it takes them to cross an intersection and thus, dictates how to design the intersection to avoid potential conflicts with bicyclists and motor vehicles. The guidance in this chapter specifically relates to pedestrian travel within

intersections on the State highway system. See Topic 105, Pedestrian Facilities, Design Information Bulletin 82 - "Pedestrian Accessibility Guidelines for Highway Projects," the AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, and the California Manual on Uniform Traffic Control Devices (California MUTCD) for additional guidance.

401.3 Traffic Considerations

Good intersection design clearly indicates to bicyclists and motorists how to traverse the intersection (see Figure 403.6A). Designs that encourage merging traffic to yield to through bicycle and motor vehicle traffic are desirable.

The size, maneuverability, and other characteristics of bicycles and motorized vehicles (automobiles, trucks, transit vehicles, farm equipment, etc.) are all factors that influence the design of an intersection. The differences in operating characteristics between bicycles and motor vehicles should be considered early in design.

Table 401.3 compares vehicle characteristics to intersection design elements.

A design vehicle is a convenient means of representing a particular segment of the vehicle population. See Topic 404 for a further discussion of the uses of design vehicles.

Transit vehicles and how their stops interrelate with an intersection, pedestrian desired walking patterns and potential transfers to other transit facilities are another critical factor to understand when designing an intersection. Transit stops and their placement needs to take into account the required maintenance operations that will be needed and usually supplied by the Transit Operator.

401.4 The Physical Environment

In highly developed urban areas, where right of way is usually limited, the volume of vehicular traffic, pedestrians, and bicyclists may be large, street parking exists, and transit stops (for both buses and light rail) are available. All interact in a variety of movements that contribute to and add to the complexity of a State highway and can result in busy intersections.

Industrial development may require special attention to the movement of large trucks.

Rural areas where farming occurs may require special attention for specialized farm equipment. In addition, rural cities or town centers (rural main streets) also require special attention.

Rural intersections in farm areas with low traffic volumes may have special visibility problems or require shadowing of left-turn vehicles from high speed approach traffic.

Table 401.3

Vehicle Characteristics	Intersection Design Element Affected
Length	Length of storage lane
Width	Lane width
Height	Clearance to overhead signs and signals
Wheel base	Corner radius and width of turning lanes
Acceleration	Tapers and length of acceleration lane
Deceleration	Tapers and length of deceleration lane

There are many factors to be considered in the design of intersections, with the goal to achieve a functional, safe and efficient intersection for all users of the facility. The location and level of use by various modes will have an impact on intersection design, and therefore should be considered early in the design process. In addition to current levels of use, it is important to consider future travel patterns for vehicles, including trucks; pedestrian and bicycle demand and the future expansion of transit.

401.5 Intersection Type

Intersection types are characterized by their basic geometric configuration, and the form of intersection traffic control that is employed:

(1) Geometric Configurations

(a) Crossing-Type Intersections - "Tee" and 4-legged intersections

(b) Circular Intersections –roundabouts, traffic circles, rotaries; however, only roundabouts are acceptable for State highways.

(c) Alternative Intersection Designs – various effective geometric alternatives to traditional designs that can reduce crashes and their severity, improve operations, reduce congestion and delay typically by reducing or altering the number of conflict points; these alternatives include geometric design features such as intersections with displaced left-turns or variations on U-turns.

(2) Intersection Control strategies, See California MUTCD and Traffic Operations Policy Directive (TOPD) Number 13-02, Intersection Control Evaluation for procedures and guidance on how to evaluate, compare and select from among the following intersection control strategies:

(a) Two-Way Stop Controlled - for minor road traffic

(b) All-Way Stop Control

(c) Signal Control

(d) Yield Control (Roundabout)

Historically, crossing-type intersections with signal or "STOP"-control have been used on the State highway system. However, other intersection types, given the appropriate circumstances may enhance intersection performance through fewer or less severe crashes and improve operations by reducing overall delay. Alternative intersection geometric designs should be considered and evaluated early in the project scoping, planning and decision-making stages, as they may be more efficient, economical and safer solutions than traditional designs. Alternative intersection designs can effectively balance the safety and mobility needs of the motor vehicle drivers, transit riders, bicyclists and pedestrians using the intersection.

401.6 Transit

Transit use may range from periodic buses, handled as part of the normal mix of vehicular traffic, to Bus Rapid Transit (BRT) or light rail facilities which can have a large impact on other users of the intersection. Consideration of these modes should be part of the early planning and design of intersections.

Topic 402 - Operational Features Affecting Design

402.1 Capacity

Adequate capacity to handle peak period traffic demands is a basic goal of intersection design.

(1) Unsignalized Intersections. The "Highway Capacity Manual", provides methodology for capacity analysis of unsignalized intersections controlled by "STOP" or "YIELD" signs. The assumption is made that major street traffic is not affected by the minor street movement. Unsignalized intersections generally become candidates for signalization when traffic backups begin to develop on the cross street or when gaps in traffic are insufficient for drivers to yield to crossing pedestrians. See the California MUTCD, for signal warrants. Changes to intersection controls must be coordinated with District Traffic Branch.

(2) Signalized Intersections. See Topic 406 for analysis of simple signalized intersections, including ramps. The analysis of complex and alternative intersections should be referred to the District Traffic Branch; also see Traffic Operations Policy Directive (TOPD) Number 13-02.

(3) Roundabout Intersections. See TOPD Number 13-02 for screening process and the Intersection Control Evaluation(ICE) Process Informational Guide for operational analysis methods and tools.

402.2 Collisions

(1) General. Intersections have a higher potential for conflict compared to other sections of the highway because travel is interrupted, traffic streams cross, and many types of turning movements occur.

The type of traffic control affects the type of collisions. Signalized intersections tend to have more rear end and same-direction

sideswipes than intersections with "STOP"-control on minor legs. Roundabouts experience few angle or crossing collisions. Roundabouts reduce the frequency and severity of collisions, especially when compared to the performance of signalized intersections in high speed environments. Other alternative intersection types are configurations to consider for minimizing the number of conflict points.

(2) Undesirable Geometric Features.

- Inadequate approach sight distance.
- Inadequate corner sight distance.
- Steep grades.
- Five or more approaches.
- Presence of curves within intersections(unless at roundabouts).
- Inappropriately large curb radii.
- Long pedestrian crossing distances.
- Intersection Angle <75 degrees (see Topic 403).

402.3 On-Street Parking

On-street parking generally decreases through-traffic capacity, impedes traffic flow, and increases crash potential. Where the primary service of the arterial is the movement of vehicles, it may be desirable to prohibit on-street parking on State highways in urban and suburban expressways and rural arterial sections. However, within urban and suburban areas and in rural communities located on State highways, on-street parking should be considered in order to accommodate existing land uses. Where adequate off-street parking facilities are not available, the designer should consider on-street parking, so that the proposed highway improvement will be compatible with the land use. On-street parking as well as off-street parking needs to comply with DIB82. See AASHTO, A Policy on Geometric Design of Highways and Streets for additional guidance related to on-street parking.

402.4 Consider All Users

Intersections should accommodate all users of the facility, including vehicles, bicyclists, pedestrians and transit. Bicycles have all the rights and responsibilities as motorist per the California Vehicle Code, but should have separate consideration of their needs, even separate facilities if volumes warrant. Pedestrians should not be prohibited from crossing one or more legs of an intersection, unless no other safe alternative exists. Pedestrians can be prohibited from crossing one or more legs of an intersection if a reasonable alternate route exists and there is a demonstrated need to do so. All pedestrian facilities shall be ADA compliant as outlined in DIB 82. Transit needs should be determined early in the planning and design phase as their needs can have a large impact on the performance of an intersection. Transit stops in the vicinity of intersections should be evaluated for their effect on the safety and operation of the intersection(s) under study. See Topic 108 for additional information.

402.5 Speed-Change Areas

Speed-change areas for vehicles entering or leaving main streams of traffic are beneficial to the safety and efficiency of an intersection. Entering traffic merges most efficiently with through traffic when the merging angle is less than 15 degrees and when speed differentials are at a minimum.

Topic 403 - Principles of Channelization

403.1 Preference to Major Movements

The provision of direct free-flowing high-standard alignment to give preference to major movements is good channelization practice. This may require some degree of control of the minor movements such as stopping, funneling, or even eliminating them. These controlling measures should conform to natural paths of movement and should be introduced gradually to promote smooth and efficient operation.

403.2 Areas of Conflict

Large multilane undivided intersection areas are undesirable. The hazards of conflicting movements are magnified when motorists, bicyclists, and pedestrians are unable to anticipate movements of other users within these areas. Channelization reduces areas of conflict by separating or regulating traffic movements into definite paths of travel by the use of pavement markings or traffic islands.

Multilane undivided intersections, even with signalization, are more difficult for pedestrians to cross. Providing pedestrian refuge islands enable pedestrians to cross fewer lanes at a time.

See Index 403.7 for traffic island guidance when used as pedestrian refuge. Curb extensions shorten crossing distance and increase visibility. See Index 303.4 for curb extensions.

403.3 Angle of Intersection

A right angle (90°) intersection provides the most favorable conditions for intersecting and turning traffic movements. Specifically, a right angle provides:

- The shortest crossing distance for motor vehicles, bicycles, and pedestrians.
- Sight lines which optimize corner sight distance and the ability of motorists to judge the relative position and speed of approach traffic.
- Intersection geometry that can reduce vehicle turning speeds so collisions are more easily avoided and the severity of collisions are minimized.
- Intersection geometry that sends a message to turning bicyclists and motorists that they are making a turning movement and should yield as appropriate to through traffic on the roadway they are leaving, to traffic on the receiving roadway, and to pedestrians crossing the intersection.

Minor deviations from right angles are generally acceptable provided that the potentially detrimental impact on visibility and turning movements for large trucks (see Topic 404) can be mitigated. However, large deviations from right angles may decrease visibility, hamper certain turning operations, and will increase the size of the intersection and therefore crossing distances for bicyclists and pedestrians, may encourage high speed turns, and may reduce yielding by turning traffic. When a right angle cannot be provided due to physical constraints, the interior angle should be designed as close to 90 degrees as is practical, but should not be less than 75 degrees. Mitigation should be considered for the affected intersection design features. (See Figure 403.3A). A 75 degree angle does not unreasonably increase the crossing distance or generally decrease visibility. Class II bikeway crossings at railroads follow similar guidance to Class I bikeway crossings at railroads, see Index 1003.5(3), and Figure 403.3B.

A characteristic of skewed intersection angles is that they result in larger intersections.

When existing intersection angles are less than 75 degrees, the following retrofit improvement strategies should be considered:

- Realign the subordinate intersection legs if the new alignment and intersection location(s) can be designed without introducing new geometric or operational deficiencies.
- Provide acceleration lanes for difficult turning movements due to radius or limited visibility.
- Restrict problematic turning movements; e.g. for minor road left turns with potentially limited visibility.
- Provide refuge areas for pedestrians at very long crossings.

For additional guidance on the above and other improvement strategies, consult with the District Design Liaison.

Particular attention should be given to skewed angles on curved alignment with regards to sight distance and visibility. Crossroads skewed to the left have more restricted visibility for drivers of vans and trucks than crossroads skewed to the right. In addition, severely skewed intersection angles, coupled with steep downgrades (generally over 4 percent) can increase the potential for high centered vehicles to overturn where the vehicle is on a downgrade and must make a turn greater than 90 degrees onto a crossroad. These factors should be considered in the design of skewed intersections.

403.4 Points of Conflict

Channelization separates and clearly defines points of conflict within the intersection. Bicyclists, pedestrians and motorists should be exposed to only one conflict or confronted with one decision at a time.

Speed-change areas for diverging traffic should provide adequate length clear of the through lanes to permit vehicles to decelerate after leaving the through lanes.

See AASHTO, A Policy on Geometric Design of Highways and Streets for additional guidance on speed-change lanes.

Figure 403.3A
Angle of Intersection
(Minor Leg Skewed to the Right)

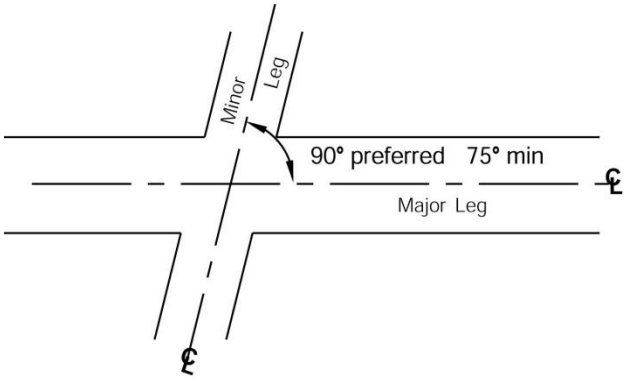
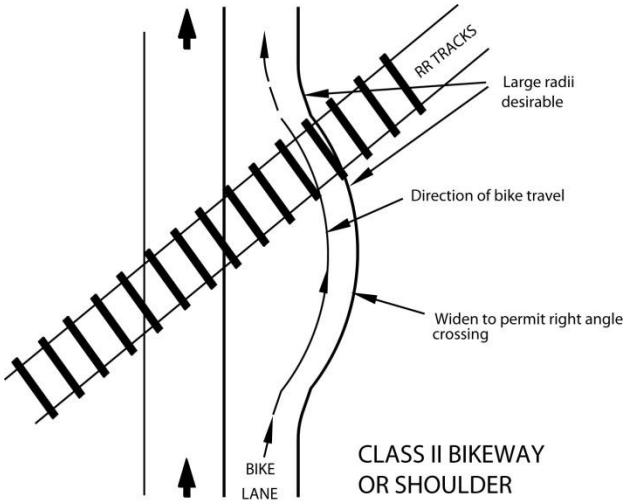


Figure 403.3.B
Class II Bikeway
Crossing Railroad



403.5 (Currently Not In Use)

403.6 Turning Traffic

A separate turning lane removes turning movements from the intersection area. Abrupt changes in alignment or sight distance should be avoided, particularly where traffic turns into a separate turning lane from a high-standard through facility.

For wide medians, consider the use of offset left-turn lanes at both signalized and unsignalized intersections. Opposing left-turn lanes are offset or shifted as far to the left as practical by reducing the width of separation immediately before the intersection. Rather than aligning the left-turn lane exactly parallel with and adjacent to the through lane, the offset left-turn lane is separated from the adjacent through lane. Offset left-turn lanes provide improved visibility of opposing through traffic. For further guidance on offset left-turn lanes, see AASHTO, A Policy on Geometric Design of Highways and Streets.

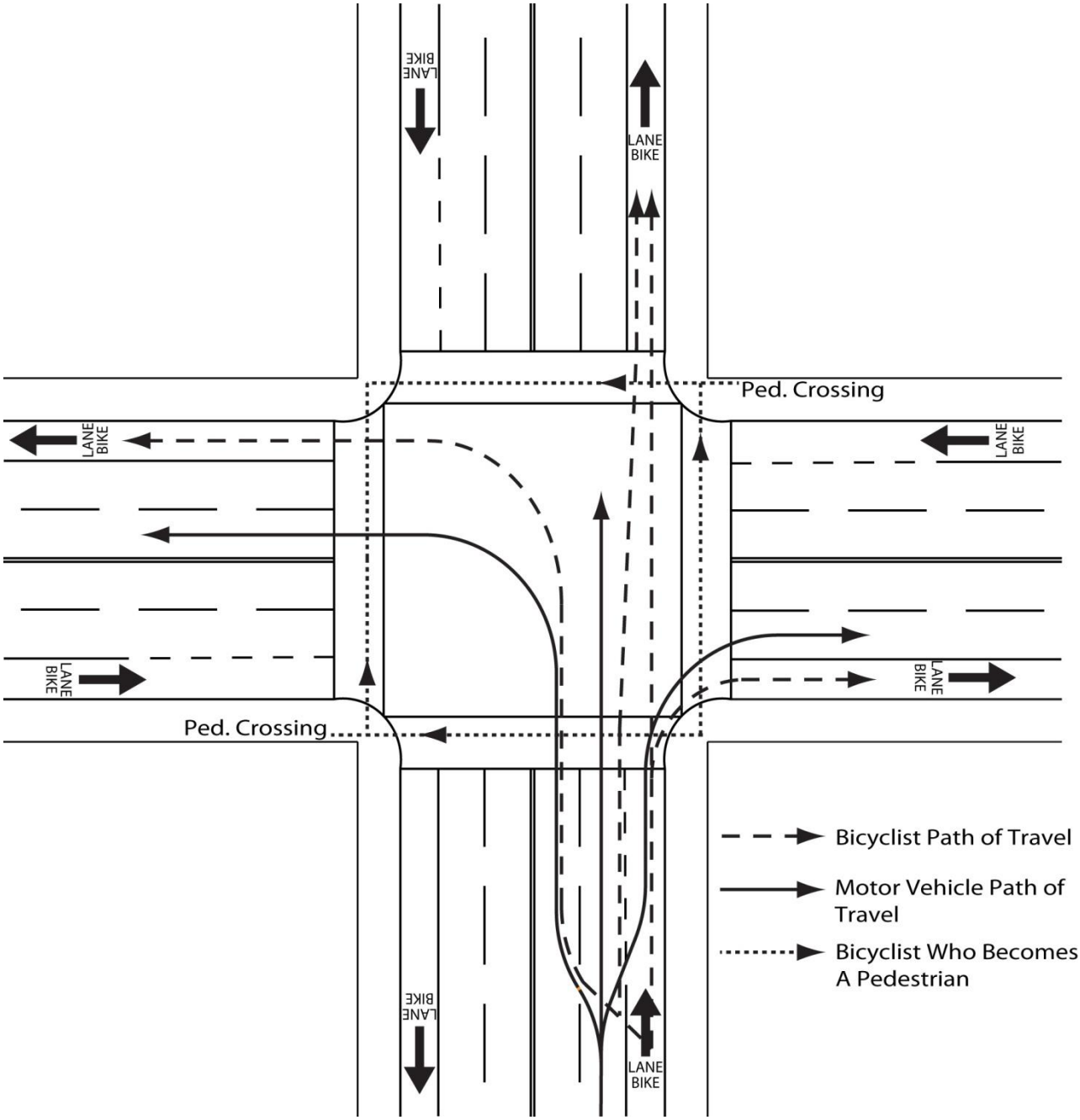
(1) Treatment of Intersections with Right-Turn-Only Lanes. Most motor vehicle/bicycle collisions occur at intersections. For this reason, intersection design should be accomplished in a manner that will minimize confusion by motorists and bicyclists, eliminate ambiguity and induce all road users to operate in accordance with the statutory rules of the road in the California Vehicle Code. Right-turn-only lanes should be designed to meet user expectations and reduce conflicts between vehicles and bicyclists.

Figure 403.6A illustrates a typical at-grade intersection of multilane streets without right-turn-only lanes. Bike lanes or shoulders are included on all approaches. Some common movements of motor vehicles and bicycles are shown. A prevalent crash type is between straight-through bicyclists and right-turning motorists, who do not yield to through bicyclists.

Optional right-turn lanes should not be used in combination with right-turn-only lanes on roads where bicycle travel is permitted. The use of optional right-turn lanes in combination with right-turn-only lanes is not recommended in any case where a Class II bike lane is present. This may increase the need for dual or triple right-turn-only lanes, which have

Figure 403.6A

Typical Bicycle and Motor Vehicle Movements at Intersections of Multilane Streets without Right-Turn-Only Lanes

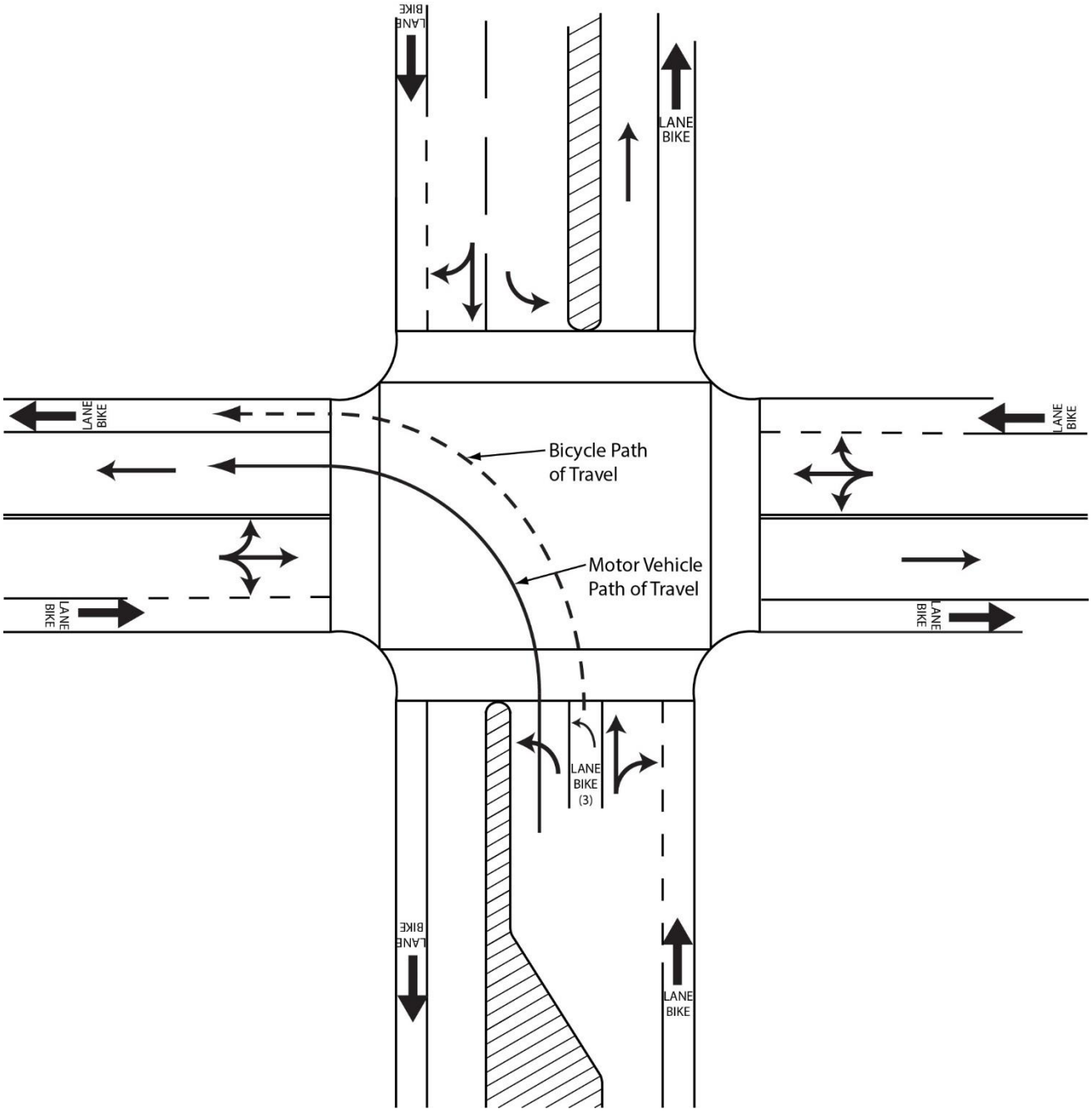


NOTE:

Only one direction is shown for clarity.

Figure 403.6B

Bicycle Left-Turn-Only Lane



NOTES:

(1) For bicycle lane markings, see the California MUTCD.

(2) Bicycle detectors are necessary for signalized intersections.

(3) Left-turn bicycle lane should have receiving bike lane or shoulder.

challenges with visibility between turning vehicles and pedestrians. Multiple right-turn-only lanes should not be free right-turns when there is a pedestrian crossing. If there is a pedestrian crossing on the receiving leg of multiple right-turn-only lanes, the intersection should be controlled by a pedestrian signal head, or geometrically designed such that pedestrians cross only one turning lane at a time.

Locations with right-turn-only lanes should provide a minimum 4-foot width for bicycle use between the right-turn and through lane when bikes are permitted, except where posted speed is greater than 40 miles per hour, the minimum width should be 6 feet. Configurations that create a weaving area without defined lanes should not be used.

For signing and delineation of bicycle lanes at intersections, consult District Traffic Operations.

Figure 403.6B depicts an intersection with a left-turn-only bicycle lane, which should be considered when bicycle left-turns are common. A left-turn-only bicycle lane may be considered at any intersection and should always be considered as a tool to provide mobility for bicyclists. Signing and delineation options for bicycle left-turn-only lanes are shown in the California MUTCD.

(2) Design of Intersections at Interchanges. The design of at-grade intersections at interchanges should be accomplished in a manner that will minimize confusion of motorists, bicyclists, and pedestrians. Higher speed, uncontrolled entries and exits from freeway ramps should not be used at the intersection of the ramps with the local road. The smallest curb return radius should be used that accommodates the design vehicle. Intersections with interior angles close to 90 degrees reduce speeds at conflict points between motorists, bicyclists, and pedestrians. The intersection skew guidance in Index 403.3 applies to all ramp termini at the local road.

403.7 Refuge Areas

Traffic islands should be used to provide refuge areas for bicyclists and pedestrians. See Index 405.4 for further guidance.

403.8 Prohibited Turns

Traffic islands may be used to direct bicycle and motorized vehicle traffic streams in desired directions and prevent undesirable movements. Care should be taken so that islands used for this purpose accommodate convenient and safe pedestrian and bicycle crossings, drainage, and striping options. See Topic 303.

403.9 Effective Signal Control

At intersections with complex turning movements, channelization is required for effective signal control. Channelization permits the sorting of approaching bicycles and motorized vehicles which may move through the intersection during separate signal phases. Pedestrians may also have their own signal phase. This requirement is of particular importance when traffic-actuated signal controls are employed.

The California MUTCD has warrants for the placement of signals to control vehicular, bicycle and pedestrian traffic. Pedestrian activated devices, signals or beacons are not required, but must be evaluated where directional, multilane, pedestrian crossings occur. These locations may include:

- Mid-block street crossings;
- Channelized turn lanes;
- Ramp entries and exits; and
- Roundabouts.

The evaluation, selection, programming and use of a chosen device should be done with guidance from District Traffic Operations.

403.10 Installation of Traffic Control Devices

Channelization may provide locations for the installation of essential traffic control devices, such as “STOP” and directional signs. See Index 405.4 for information about the design of traffic islands.

403.11 Summary

- Give preference to the major move(s).

- Reduce areas of conflict.
- Reduce the duration of conflicts.
- Cross traffic at right angles or skew no more than 75 degrees. (90 degrees preferred.)
- Separate points of conflict.
- Provide speed-change areas and separate turning lanes where appropriate.
- Provide adequate width to shadow turning traffic.
- Restrict undesirable moves with traffic islands.
- Coordinate channelization with effective signal control.
- Install signs in traffic islands when necessary but avoid building conflicts one or more modes of travel.
- Consider all users.

403.12 Other Considerations

- An advantage of curbed islands is they can serve as pedestrian refuge. Where curbing is appropriate, consideration should be given to mountable curbs. See Topic 303 for more guidance.
- Avoid complex intersections that present multiple choices of movement to the motorist and bicyclist.
- Traffic safety should be considered. Collision records provide a valuable guide to the type of channelization needed.

Topic 404 - Design Vehicles

404.1 General

Any vehicle, whether car, bus, truck, or recreational vehicle, while turning a curve, covers a wider path than the width of the vehicle. The outer front tire can generally follow a circular curve, but the inner rear tire will swing in toward the center of the curve.

Some terminology is vital to understanding the engineering concepts related to design vehicles. See Index 62.4 Interchanges and Intersection at Grade for terminology.

404.2 Design Considerations

It may not be necessary to provide for design vehicle turning movements at all intersections along the State route if the design vehicle's route is restricted or it is not expected to use the cross street frequently. Discuss with Traffic Operations and the local agency before a turning movement is not provided. The goal is to minimize possible conflicts between vehicles, bicycles, pedestrians, and other users of the roadway, while providing the minimum curb radii appropriate for the given situation.

Both the tracking width and swept width should be considered in the design of roadways for use of the roadway by design vehicles.

Tracking width lines delineate the path of the vehicle tires as the vehicle moves through the turn.

Swept width lines delineate the path of the vehicle body as the vehicle moves through the turn and will therefore always exceed the tracking width. The following list of criteria is to be used to determine whether the roadway can accommodate the design vehicle.

(1) Traveled way.

(a) To accommodate turn movements(e.g., at intersections, driveways, alleys, etc.),the travel way width and intersection design should be such that tracking width and swept width lines for the design vehicle do not cross into any portion of the lane for opposing traffic. Encroachment into the shoulder and bike lane is permitted.

(b) Along the portion of roadway where there are no turning options, vehicles are required to stay within the lane lines. **The tracking and swept widths lines for the design vehicle shall stay within the lane as defined in Index 301.1 and Table 504.3.** This includes no encroachment into Class II bike lanes.

(2) Shoulders. Both tracking width and swept width lines may encroach onto paved shoulders to accommodate turning. For design projects where the tracking width lines are shown to encroach onto paved shoulders, the shoulder pavement structure should be engineered to sustain the weight of the design vehicle. See Index 613 for general traffic loading

considerations and Index 626 for tied rigid shoulder guidance. At corners where no sidewalks are provided and pedestrians are using the shoulder, a paved refuge area may be provided outside the swept width of turning vehicle.

(3) Curbs and Gutters. Tires may not mount curbs. If curb and gutter are present and any portion of the gutter pan is likewise encroached, the gutter pan must be engineered to match the adjacent shoulder pavement structure. See Index 613.5(2)(c) for gutter pan design guidance.

(4) Edge of Pavement. To accommodate a turn, the swept width lines may cross the edge of pavement provided there are no obstructions. The tracking width lines must remain on the pavement structure, including the shoulder, provided that the shoulder is designed to support vehicular traffic. If truck volumes are high, consideration of a wider shoulder is encouraged in order to preserve the pavement edge.

(5) Bicycle Lanes. Where bicycle lanes are considered, the design guidance noted above applies. Vehicles are permitted to cross a bicycle lane to initiate or complete a turning movement or for emergency parking on the shoulder. See the California MUTCD for Class II bike lane markings.

To accommodate turn movements (e.g., intersections, driveways, alleys, etc. are present), both tracking width and swept width lines may cross the broken white painted bicycle lane striping in advance of the right-turn, entering the bicycle lane when clear to do so.

(6) Sidewalks. Tracking width and swept width lines must not encroach onto sidewalks or pedestrian refuge areas, without exception.

(7) Obstacles. Swept width lines may not encroach upon obstacles including, but not limited to, curbs, islands, sign structures, traffic delineators/channelizers, traffic signals, lighting poles, guardrails, trees, cut slopes, and rock outcrops.

(8) Appurtenances. Swept width lines do not include side mirrors or other appurtenances allowed by the California Vehicle Code, thus, accommodation to non-motorized users of the facility and appurtenances should be considered.

If both the tracking width and swept width lines meet the design guidance listed above, then the geometry is adequate for that design vehicle. Consideration should be given to pedestrian crossing distance, motor vehicle speeds, truck volumes, alignment, bicycle lane width, sight distance, and the presence of on-street parking.

Note that the STAA Design Vehicle has a template with a 56-foot (minimum) and a 67-foot (longer) radius and the California Legal Design Vehicle has a template with 50-foot (minimum) and 60-foot (longer) radii. These templates are shown in Figures 404.5A through 404.5D. The longer radius templates are more conservative. The longer radius templates develop less swept width and leave a margin of error for the truck driver. The longer radius templates should be used for conditions where the vehicle may not be required to stop before entering the intersection.

The minimum radius template can be used if the longer radius template does not clear all obstacles. The minimum radius templates demonstrate the tightest turn that the vehicles can navigate, assuming a speed of less than 10 miles per hour.

For offtracking lane width requirements on freeway ramps, see Topic 504.

404.3 Design Tools

District Truck Managers should be consulted early in the project to ensure compliance with the design vehicle guidance contained in Topic 404. Consult local agencies to verify the location of local truck routes. Essentially, two options are available – templates or computer software.

- The turning templates in Figures 404.5A through G are a design aid for determining the swept width and/or tracking width of large vehicles as they maneuver through a turn. The templates can be used as overlays to evaluate the adequacy of the geometric layout of a curve or intersection when reproduced on clear film and scaled to match the highway drawings. These templates assume a vehicle speed of less than 10 miles per hour.

- Computer software such as AutoTURN or AutoTrak can draw the swept width and/or tracking width along any design curve within a CADD drawing program such as MicroStation or AutoCAD. Dimensions taken from the vehicle diagrams in Figures 404.5A through G may be inputted into the computer program by creating a custom vehicle if the vehicle is not already included in the software library. The software can also create a vehicle turn template that conforms to any degree curve desired.

404.4 Design Vehicles and Related Definitions

(1) The Surface Transportation Assistance Act of 1982 (STAA).

(a) STAA Routes. STAA allows certain longer trucks called STAA trucks to operate on the National Network. After STAA was enacted, the Department evaluated State routes for STAA truck access and created Terminal Access and Service Access routes which, together with the National Network, are called the STAA Network. Terminal Access routes allow STAA access to terminals and facilities. Service Access routes allow STAA trucks one-mile access off the National Network, but only at identified exits and only for designated services. Service Access routes are primarily local roads. A "Truck Route Map," indicating the National Network routes and the Terminal Access routes is posted on the Department's Office of Commercial Vehicle Operations website and is also available in printed form.

(b) STAA Design Vehicle. The STAA design vehicle is a truck tractor-semitrailer combination with a 48-foot semitrailer, a 43-foot kingpin-to-rear-axle (KPRA) distance, an 8.5-foot body and axle width, and a 23-foot truck tractor wheelbase. Note, a truck tractor is a non-load-carrying vehicle. There is also a STAA double (truck tractor-semitrailer-trailer); however, the double is not used as the design vehicle due to its shorter turning radius. The STAA Design Vehicle is shown in Figures 404.5A and B.

<u>The STAA Design Vehicle in Figures 404.5A or B should be used on the National Network, Terminal Access, California Legal, and Advisory routes.</u>

(c) STAA Vehicle – 53-Foot Trailer. Another category of vehicle allowed only on STAA routes has a maximum 53-foot trailer, a maximum 40-foot KPRA for two or more axles, a maximum 38-foot KPRA for a single axle, and unlimited overall length. This vehicle is not to be used as the design vehicle as it is not the worst case for offtracking due to its shorter KPRA. The STAA Design Vehicle should be used instead.

(2) California Legal.

(a) California Legal Routes. Virtually all State routes off the STAA Network are California Legal routes. There are two types of California Legal routes, the regular California Legal routes and the KPRA Advisory Routes. Advisory routes have signs posted that state the maximum KPRA length that the route can accommodate without the vehicle offtracking outside the lane. KPRA advisories range from 30 feet to 38 feet, in 2-foot increments. California Legal vehicles are allowed to use both types of California Legal routes. California Legal vehicles can also use the STAA Network. However, STAA trucks are not allowed on any California Legal routes. The Truck Route Map indicating the California Legal routes is posted on the Department's Office of Commercial Vehicle Operations website.

(b) California Legal Design Vehicle. The California Legal vehicle is a truck tractor-semitrailer with the following dimensions: the maximum overall length is 65 feet; the maximum KPRA distance is 40 feet for semitrailers with two or more axles, and 38 feet for semitrailers with a single axle; the maximum width is 8.5 feet. There are also two categories of California Legal doubles (truck tractor-semitrailer-trailer); however, the doubles are not used as the design vehicle due to their shorter turning radii. The California Legal Design Vehicle is shown in Figures 404.5C and D.

The California Legal Design Vehicle in Figures 404.5C and D should only be used when the STAA design vehicle is not feasible and with concurrence from the District Truck Manager.

(3) 40-Foot Bus.

(a) 40-Foot Bus Routes. All single-unit vehicles, including buses and motor trucks up to 40 feet in length, are allowed on virtually every route in California.

(b) 40-Foot Bus Design Vehicle. The 40-Foot Bus Design Vehicle shown in Figure 404.5E is an AASHTO standard. Its 25-foot wheelbase and 40-foot length are typical of city transit buses and some intercity buses. At intersections where truck volumes are light or where the predominate truck traffic consists of mostly 3-axle units, the 40-foot bus may be used. Its wheel path sweeps a greater width than 3-axle delivery trucks, as well as smaller buses such as school buses.

(4) 45-Foot Bus & Motorhome.

(a) 45-Foot Bus & Motorhome Routes. The "45-foot bus and motorhome" refers to bus and motorhomes over 40 feet in length, up to and including 45 feet in length. These longer buses and motorhomes are allowed in California, but only on certain routes.

The 45-foot tour bus became legal on the National Network in 1991 and later allowed on some State routes in 1995. The 45-foot motorhome became legal in California in 2001, but only on those routes where the 45-foot bus was already allowed. A Bus and Motorhome Map indicating where these longer buses and motorhomes are allowed and where they are not allowed is posted on the Department's Office of Commercial Vehicle Operations website.

(b) 45-Foot Bus and Motorhome Design Vehicle. The 45-Foot Bus & Motorhome Design Vehicle shown in Figure 404.5F is used by Caltrans for the longest allowable bus and motorhome. Its wheelbase is 28.5 feet. It is also similar to the AASHTO standard 45-foot bus. Typically this should be the smallest design vehicle used on a State highway. It may be used where the State highway intersects local streets without commercial or industrial traffic.

The 45-Foot Bus and Motorhome Design Vehicle shown in Figure 404.5F should be used in the design of all interchanges and intersections on all green routes indicated on the Bus and Motorhome Map for both new construction and rehabilitation projects. Check also the longer standard design vehicles on these routes as required – the STAA Design Vehicle and the California Legal Design Vehicle in Indexes 404.4(1) and (2).

(5) 60-Foot Articulated Bus.

(a) 60-Foot Articulated Bus Routes. The articulated bus is allowed a length of up to 60 feet per CVC 35400(b)(3)(A). This bus is used primarily by local transit agencies for public transportation. There is no master listing of such routes. Local transit agencies should be contacted to determine possible routes within the proposed project.

(b) 60-Foot Articulated Bus Design Vehicle. The 60-Foot Articulated Bus Design Vehicle shown in Figure 404.5G is an AASHTO standard. The routes served by these buses should be designed to accommodate the 60-Foot Articulated Bus Design Vehicle.

404.5 Turning Templates & Vehicle Diagrams

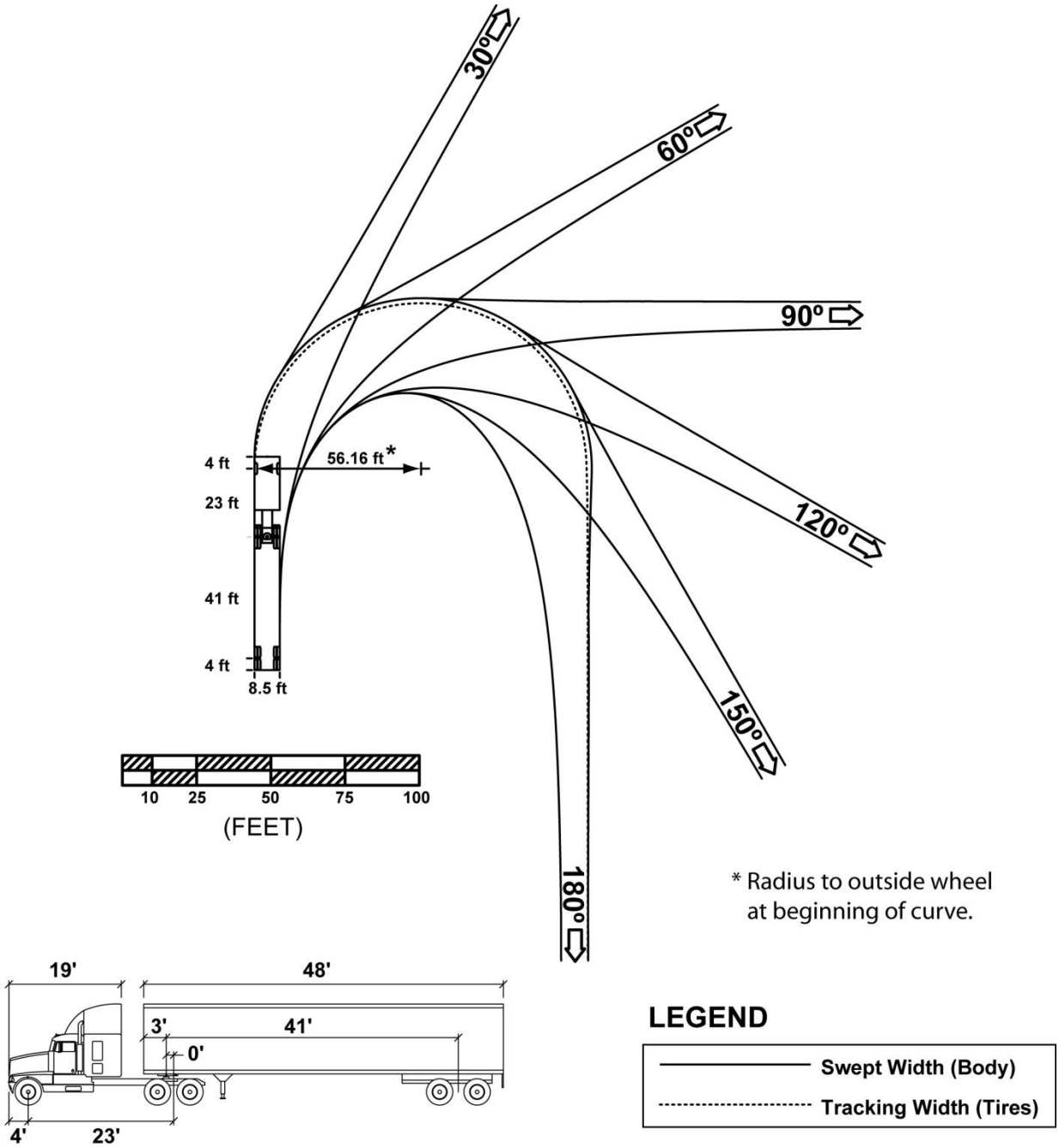
Figures 404.5A through G are computer-generated turning templates at an approximate scale of 1"=50' and their associated vehicle diagrams for the design vehicles described in Index 404.3. The radius of the template is measured to the outside front wheel path at the beginning of the curve. Figures 404.5A through G contain the terms defined as follows:

(1) Tractor Width - Width of tractor body.

(2) Trailer Width - Width of semitrailer body.

(3) Tractor Track - Tractor axle width, measured from outside face of tires.

Figure 404.5A
STAA Design Vehicle
56-Foot Radius



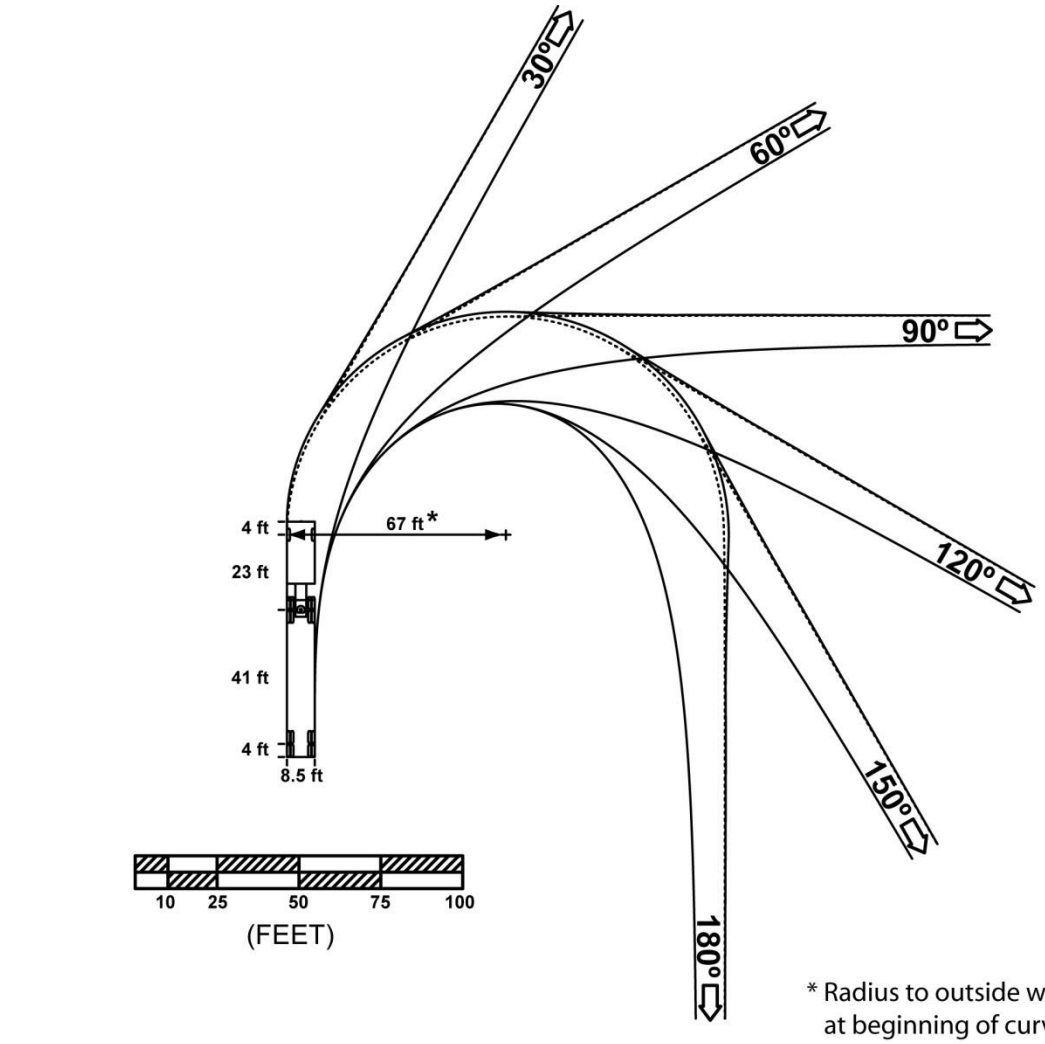
STAA - STANDARD

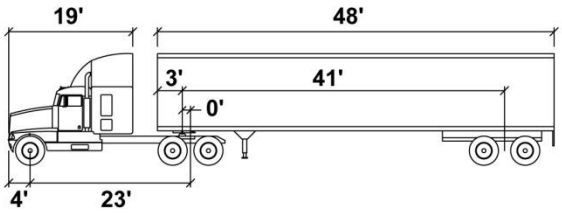
Tractor Width	: 8.5'	Lock to Lock Time	: 6 seconds
Trailer Width	: 8.5'	Steering Lock Angle	: 26.3 degrees
Tractor Track	: 8.5'	Articulating Angle	: 70 degrees
Trailer Track	: 8.5'		

Note: For definitions, see Indexes 404.1 and 404.5.

Figure 404.5B

STAA Design Vehicle
67-Foot Radius





LEGEND

Swept Width (Body)

Tracking Width (Tires)

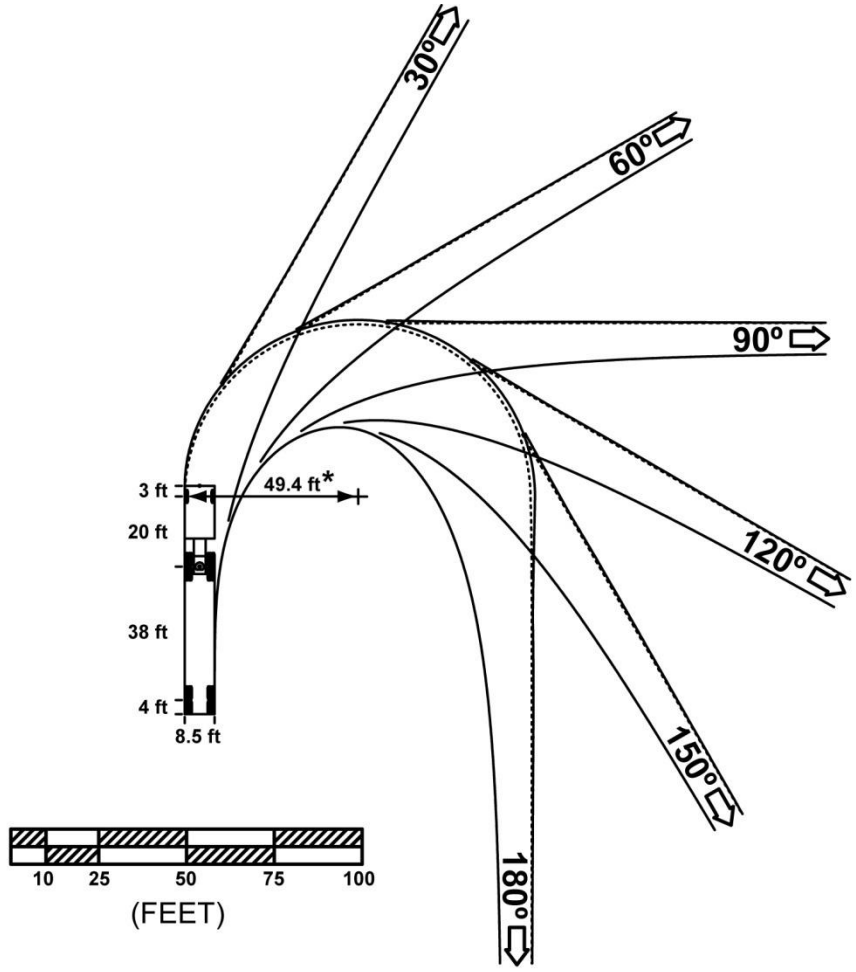
STAA - STANDARD

Tractor Width	: 8.5'	Lock to Lock Time	: 6 seconds
Trailer Width	: 8.5'	Steering Lock Angle	: 26.3 degrees
Tractor Track	: 8.5'	Articulating Angle	: 70 degrees
Trailer Track	: 8.5'		

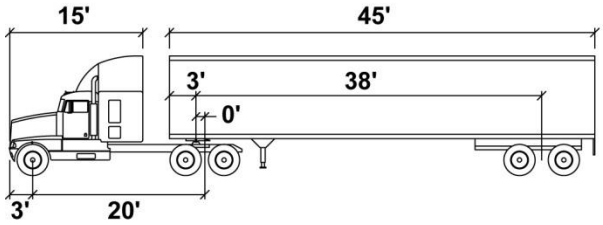
Note: For definitions, see Indexes 404.1 and 404.5.

Figure 404.5C

California Legal Design Vehicle
50-Foot Radius



* Radius to outside wheel at beginning of curve.



LEGEND

Swept Width (Body)

Tracking Width (Tires)

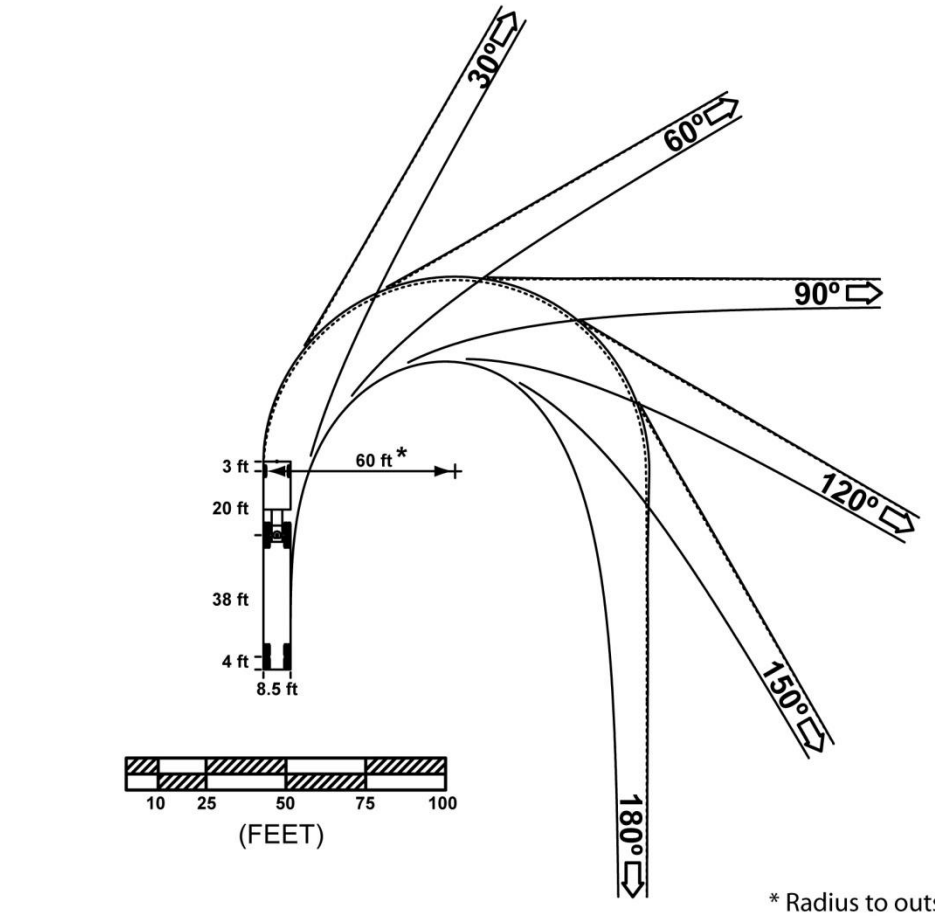
CA LEGAL - 65 FT

Tractor Width	: 8.5'	Lock to Lock Time	: 6 seconds
Trailer Width	: 8.5'	Steering Lock Angle	: 26.3 degrees
Tractor Track	: 8.5'	Articulating Angle	: 70 degrees
Trailer Track	: 8.5'		

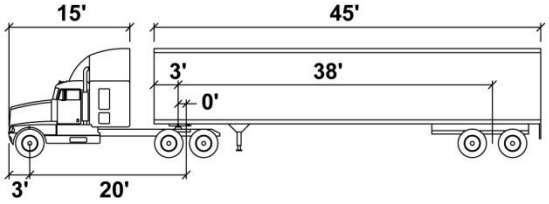
Note: For definitions, see Indexes 404.1 and 404.5.

Figure 404.5D

California Legal Design Vehicle
60-Foot Radius



* Radius to outside wheel at beginning of curve.



LEGEND

Swept Width (Body)

Tracking Width (Tires)

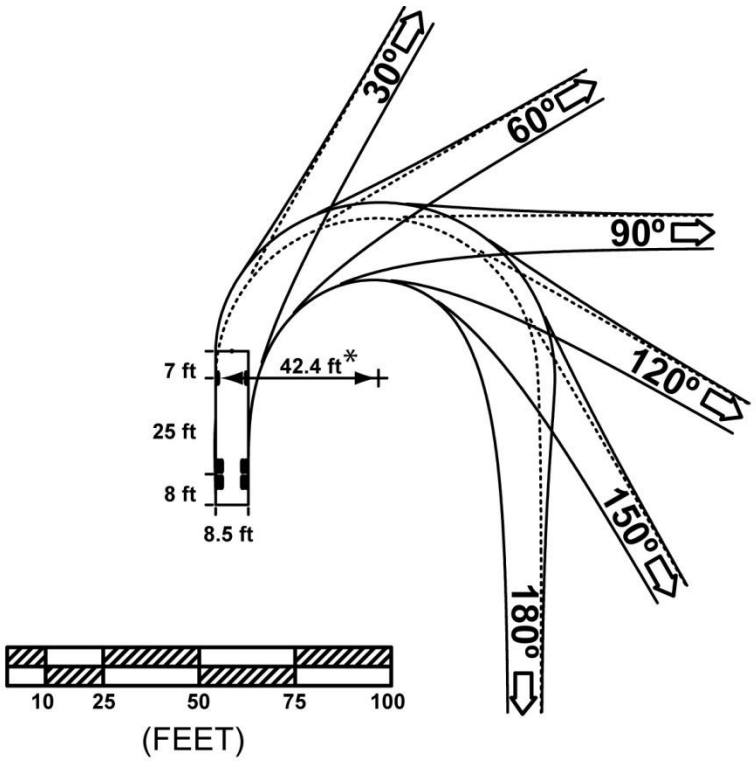
CA LEGAL - 65 FT

Tractor Width	: 8.5'	Lock to Lock Time	: 6 seconds
Trailer Width	: 8.5'	Steering Lock Angle	: 26.3 degrees
Tractor Track	: 8.5'	Articulating Angle	: 70 degrees
Trailer Track	: 8.5'		

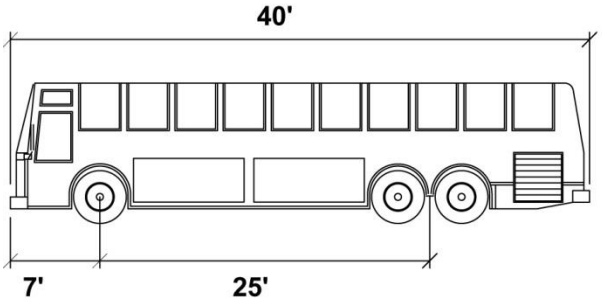
Note: For definitions, see Indexes 404.1 and 404.5.

Figure 404.5E

40-Foot Bus Design Vehicle



* Radius to outside wheel at beginning of curve.



LEGEND

———	Swept Width (Body)
- - - - - - - - - -	Tracking Width (Tires)

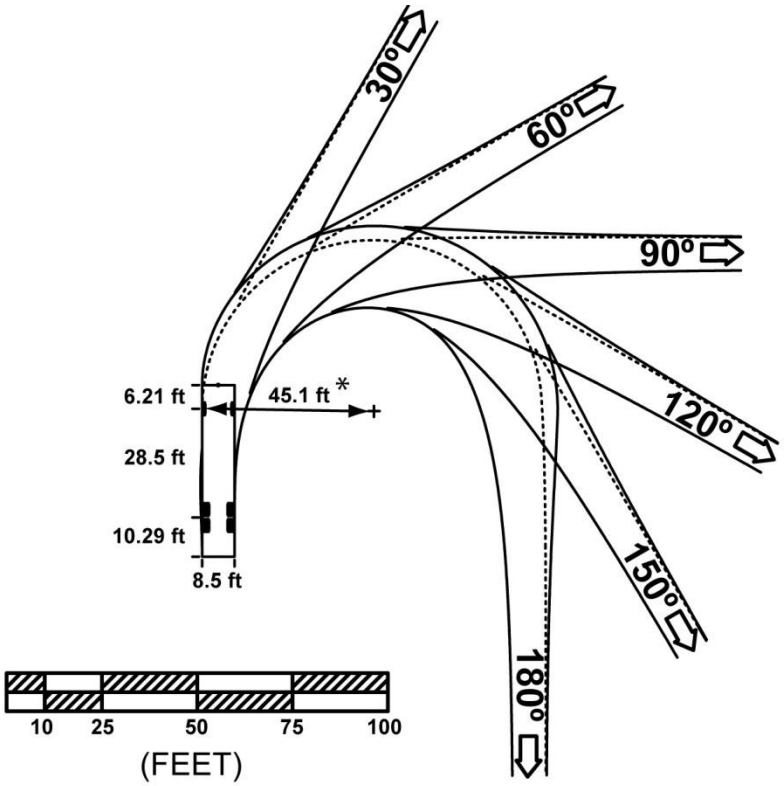
40' BUS

Width	: 8.5'
Track	: 8.5'
Lock to Lock Time	: 6 seconds
Steering Lock Angle	: 41.0 degrees

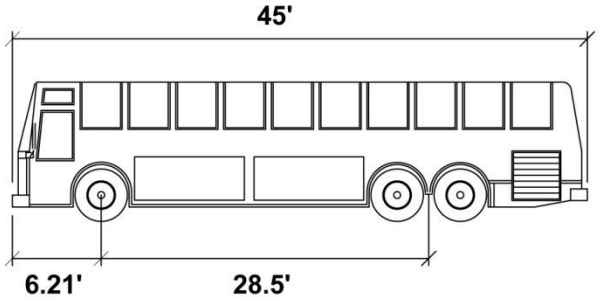
Note: For definitions, see Indexes 404.1 and 404.5.

Figure 404.5F

45-Foot Bus & Motorhome Design Vehicle



* Radius to outside wheel at beginning of curve.



LEGEND

———	Swept Width (Body)
- - - - - - - - - -	Tracking Width (Tires)

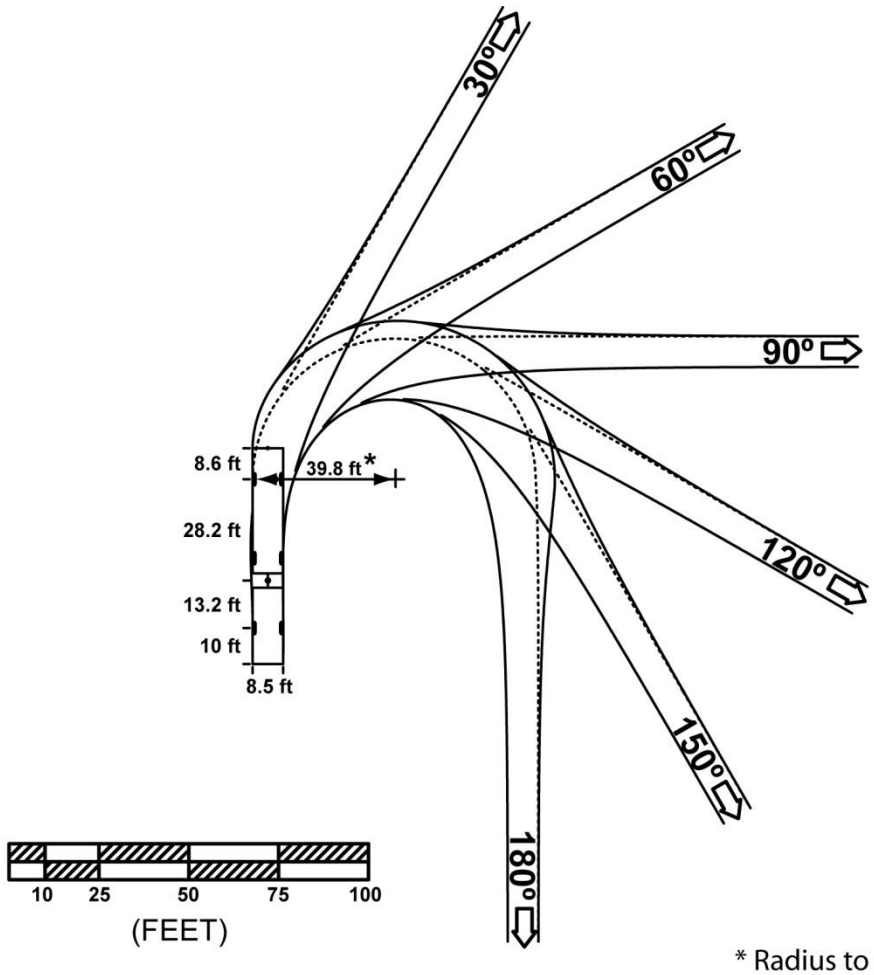
45' BUS

Width	: 8.5'
Track	: 8.5'
Lock to Lock Time	: 6 seconds
Steering Lock Angle	: 44.3 degrees

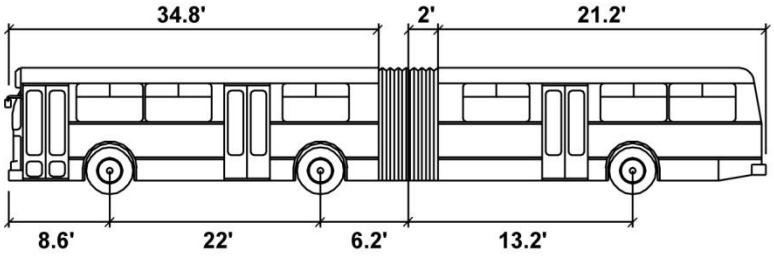
Note: For definitions, see Indexes 404.1, and 404.5.

Figure 404.5G

60-Foot Articulated Bus Design Vehicle



* Radius to outside wheel at beginning of curve.



LEGEND

Swept Width (Body)

Tracking Width (Tires)

ARTICULATED BUS

Width	: 8.5'
Track	: 8.5'
Lock to Lock Time	: 6 seconds
Steering Lock Angle	: 38.3 degrees
Articulating Angle	: 50.0 degrees

Note: For definitions, see Indexes 404.1 and 404.5.

(4) Trailer Track – Semitrailer axle width, measured from outside face of tires.

(5) Lock To Lock Time - The time in seconds that an average driver would take under normal driving conditions to turn the steering wheel of a vehicle from the lock position on one side to the lock position on the other side. The default in AutoTurn software is 6 seconds.

(6) Steering Lock Angle - The maximum angle that the steering wheels can be turned. It is further defined as the average of the maximum angles made by the left and right steering wheels with the longitudinal axis of the vehicle.

(7) Articulating Angle - The maximum angle between the tractor and semitrailer.

Topic 405 - Intersection Design Standards

405.1 Sight Distance

(1) Stopping Sight Distance. See Index 201.1 for minimum stopping sight distance requirements.

(2) *Corner Sight Distance*.

(a) General--At unsignalized intersections a substantially clear line of sight should be maintained between the driver of a vehicle, bicyclist or pedestrian stopped on the minor road and the driver of an approaching vehicle on the major road that has no stop. Line of sight for all users should be included in right of way, in order to preserve sight lines.

See DIB 79 for 2R, 3R, certain storm damage, protective betterment, operational, and safety projects on two-lane and three-lane conventional highways.

Adequate time should be provided for the stopped vehicle on the minor road to either cross all lanes of through traffic, cross the near lanes and turn left, or turn right, without requiring through traffic to radically alter their speed. The visibility required for these maneuvers form a clear sight triangle with the corner sight distance b and the crossing distance a_1 or a_2 (see Figure 405.1 as an example of corner sight distance at a two-lane, two-way highway). Dimensions a_1 and a_2 are measured from the decision point to the center of the lane. The actual number of lanes will vary on the major and minor roads. There should be no sight obstruction within the clear sight triangle.

The methodology used for the driver on the minor road that is stopped to complete the necessary maneuver while the approaching vehicle travels at the design speed of the major road is based on gap-acceptance behavior. A 7-1/2 second criterion is applied to a passenger car (including pickup trucks) for a left turn from a stop on the minor road. However, this time gap does not account for a single-unit truck (no semitrailer), a combination truck (see Index 404.4 for truck tractor-semitrailer guidance), a right-turn from a stop, or for a crossing maneuver. See Table 405.1A for the time gap that addresses these situations for the assumed design vehicle making these maneuvers from the minor road.

In determining corner sight distance, a set back distance for the vehicle waiting on the minor road must be assumed as measured from the edge of traveled way of the major road. Set back for the driver of the vehicle on the minor road should be a minimum of 10 feet plus the shoulder width of the major road but not less than 15 feet. The location of the driver's eye for the set back is the decision point per Figure 405.1. Corner sight distance and the driver's eye set back are also illustrated in Figures 405.7 and 504.3I. Line of sight for corner sight distance for passenger cars is to be determined from a 3 and 1/2-foot height at the location of the driver of the vehicle in the center of the minor road lane to a 3 and 1/2-foot object height in the center of the approaching outside lane of the major road. This provides for reciprocal sight by both vehicles. The passenger car driver's eye height should be applied to all minor roads. In addition, a truck driver's eye height of 7.6 feet should be applied to the minor road where applicable. Additionally, if the major road has a median barrier, a 2-foot object height should be used to determine the

median barrier set back. A median that is wide enough to accommodate a stopped vehicle should also provide a clear sight triangle.

The minimum corner sight distance (feet) should be determined by the equation: $1.47V_mT_g$, where V_m is the design speed (mph) of the major road and T_g is the time gap (seconds) for the minor road vehicle to enter the major road. The values given in Table 405.1A should be used to determine T_g based on the design vehicle, the type of maneuver, and whether the stopped vehicle's rear wheels are on an upgrade exceeding 3 percent. The distance from the edge of traveled way to the rear wheels at the minor road stop location should be assumed as: 20 feet for a passenger car, 30 feet for a single-unit truck, and 72 feet for a combination truck.

(b) Public Road Intersections (Refer to Topic 205 and Index 405.7); corner sight distance applies, see Table 405.1A.

At signalized intersections the corner sight distances should also be applied whenever possible. Even though traffic flows are designed to move at separate times, unanticipated conflicts can occur due to violation of signal, right turns on red, malfunction of the signal, or use of flashing red/yellow mode.

The minimum value for corner sight distance at signalized intersections should be equal to the stopping sight distance as given in Table 201.1, measured as previously described. This includes an urban driveway that forms a leg of the signalized intersection.

(c) Private Road Intersections (Refer to Index 205.2) and Rural Driveways (Refer to Index 205.4); corner sight distance applies, see Table 405.1A. If signalized, the minimum corner sight distance should be equal to the stopping sight distance as given in Table 201.1, measured as previously described.

(d) Urban Driveways (Refer to Index 205.3); corner sight distance requirements as described above are not applied to urban driveways unless signalized. See Index 405.1(2)(b) underlined standard. If parking is allowed on the major road, parking should be prohibited on both sides of the driveway per the California MUTCD, 3B.19.

(3) Decision Sight Distance. At intersections where the State route turns or crosses another State route, the decision sight distance values given in Table 201.7 should be used. In computing and measuring decision sight distance, the 3.5-foot eye height and the 0.5-foot object height should be used, the object being located on the side of the intersection nearest the approaching driver.

The application of the various sight distance requirements for the different types of intersections is summarized in Table 405.1B.

Table 405.1B
Application of Sight Distance Requirements

Intersection Types	Sight Distance		
	Stopping	Corner	Decision
Private Roads	X	X(1)	
Public Streets and Roads	X	X	
Signalized Intersections	X	X(2)	
State Route Intersections & Route Direction Changes, with or without Signals	X	X	X

NOTES:
(1) Per Index 405.1(2)(c), the minimum corner sight distance shall be equal to the stopping sight distance as given in Table 201.1. See Index 405.1(2)(a) for setback requirements.
(2) Apply corner sight distance requirements at signalized intersections whenever possible due to unanticipated violations of the signals or malfunctions of the signals. See Index 405.1(2)(b).

Figure 405.1
Corner Sight Distance (b)

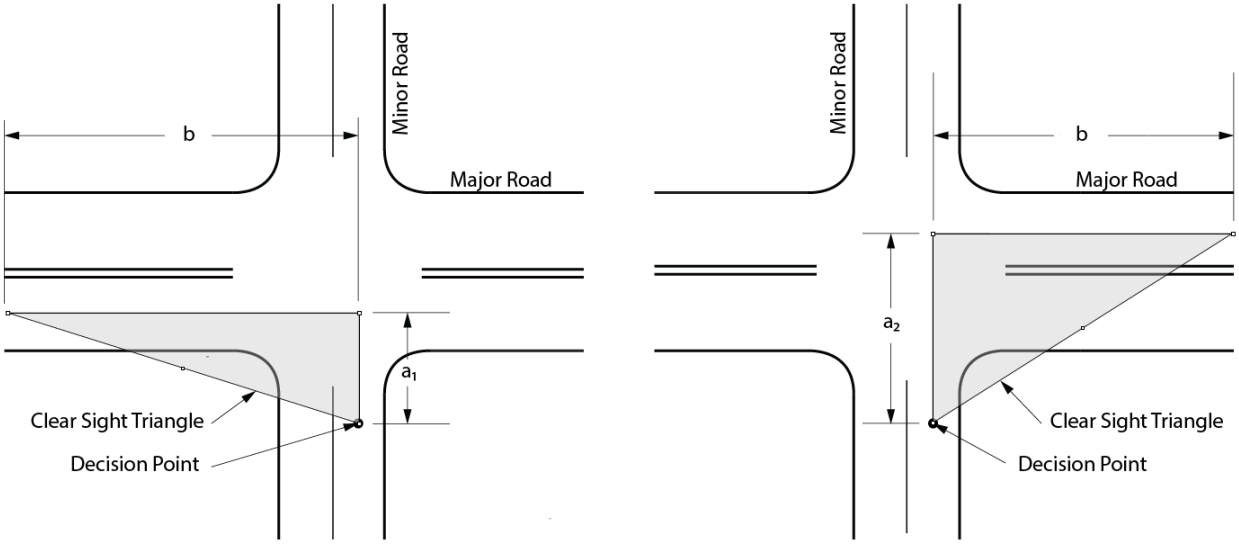


Table 405.1A
Corner Sight Distance Time Gap (T_g)
for Unsignalized Intersections

Design Vehicle	Left-turn from Stop (s) (4)	Right-turn from Stop and Crossing Maneuver (s)
Passenger Car	7½	6½
Private Road Intersection		
Rural Driveway		
Single-Unit Truck	9½	8½
Public Road Intersection		
Combination Truck	11½	10½
Major and Minor Roads on Routes:		
National Network		
Terminal or Service Access		
California Legal		
KPRA Advisory		

Notes: Time gaps are for a stopped vehicle to turn left, right or cross a two-lane highway with no median and with minor road grades of 3 percent or less. The table values should be adjusted as follows:

(1) For multilane highways—When crossing or making a left-turn onto a two-way major road with more than two lanes, add 0.5 s for passenger cars or 0.7 s for trucks for each additional lane to be crossed. Median widths should be converted to an equivalent number of lanes in applying the 0.5 s and 0.7 s criteria. For example, an 18-foot wide median is equivalent to 1.5 lanes; this requires an additional 0.75 s for a passenger car to cross or an additional 1.05 s for a truck to cross.

(2) For minor road approach grades—If the minor road approach grade is an upgrade that exceeds 3 percent and the rear wheels of the design vehicle are on the grade exceeding 3 percent, add 0.2 s for each percent grade for left-turns and crossing maneuvers; or add 0.1 s for each percent grade for right-turns. For example, a passenger car is turning right from a minor road and at the stop location its rear wheels are on a 4 percent upgrade; this requires an additional 0.4 s for the right-turn.

(3) Unique situations may necessitate a different design vehicle for a particular minor road than those listed here (e.g., predominant combination trucks out of a rural driveway). Additionally, for intersections at skewed angles less than 60 degrees, a further adjustment is needed. See the AASHTO "A Policy on Geometric Design of Highways and Streets" for guidance.

(4) Time gap for vehicles approaching from the left can be the same as the right-turn from stop maneuver.

(4) Acceleration Lanes for Turning Moves onto State Highways. At rural intersections, with "STOP" control on the local cross road, acceleration lanes for left and right turns onto the State facility should be considered. At a minimum, the following features should be evaluated for both the major highway and the cross road:

- divided versus undivided
- number of lanes
- design speed
- gradient
- lane, shoulder and median width
- traffic volume and composition of highway users, including trucks and transit vehicles
- turning volumes
- horizontal curve radii
- sight distance
- proximity of adjacent intersections
- types of adjacent intersections

For additional information and guidance, refer to AASHTO, A Policy on Geometric Design of Highways and Streets, the District Traffic Engineer or designee, the District Design Liaison, and the Project Delivery Coordinator.

405.2 Left-turn Channelization

(1) General. The purpose of a left-turn lane is to expedite the movement of through traffic by, controlling the movement of turning traffic, increasing the capacity of the intersection, and improving safety characteristics.

The District Traffic Branch normally establishes the need for left-turn lanes.

(2) Design Elements.

(a) Lane Width – **The lane width for both single and double left-turn lanes on State highways shall be 12 feet.**

For conventional State highways with posted speeds less than or equal to 40 miles per hour and AADTT (truck volume) less than 250 per lane that are in urban, city or town centers (rural main streets), the minimum lane width shall be 11 feet.

When considering lane width reductions adjacent to curbed medians, refer to Index 303.5 for guidance on effective roadway width, which may vary depending on drivers' lateral positioning and shy distance from raised curbs.

(b) Approach Taper -- On conventional highways without a median, an approach taper provides space for a left-turn lane by moving traffic laterally to the right. The approach taper is unnecessary where a median is available for the full width of the left-turn lane. Length of the approach taper is given by the formula on Figures 405.2A, B and C.

Figure 405.2A shows a standard left-turn channelization design in which all widening is to the right of approaching traffic and the deceleration lane (see below) begins at the end of the approach taper. This design should be used in all situations where space is available, usually in rural and semi-rural areas or in urban areas with high traffic speeds and/or volumes.

Figures 405.2B and 405.2C show alternate designs foreshortened with the deceleration lane beginning at the 2/3 point of the approach taper so that part of the deceleration takes place in the through traffic lane. Figure 405.2C is shortened further by widening half (or other appropriate fraction) on each side. These designs may be used in urban areas where constraints exist, speeds are moderate and traffic volumes are relatively low.

(c) Bay Taper -- A reversing curve along the left edge of the traveled way directs traffic into the left-turn lane. The length of this bay taper should be short to clearly delineate the left-turn move and to discourage through traffic from drifting into the left-turn lane. Table 405.2A gives offset data for design of bay tapers. In urban areas, lengths of 60 feet and 90 feet are normally

used. Where space is restricted and speeds are low, a 60-foot bay taper is appropriate. On rural high-speed highways, a 120-foot length is considered appropriate.

(d) Deceleration Lane Length -- Design speed of the roadway approaching the intersection should be the basis for determining deceleration lane length. It is desirable that deceleration take place entirely off the through traffic lanes. Deceleration lane lengths are given in Table 405.2B; the bay taper length is included. Where partial deceleration is permitted on the through lanes, as in Figures 405.2B and 405.2C, design speeds in Table 405.2B may be reduced

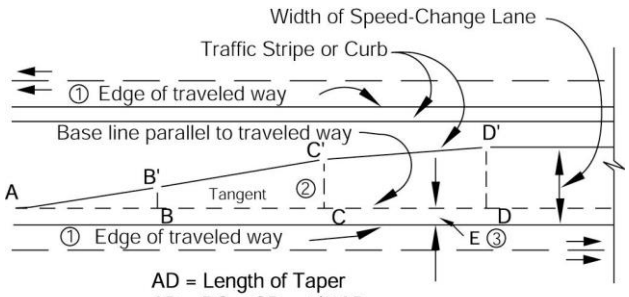
10 miles per hour to 20 miles per hour for a lower entry speed. In urban areas where cross streets are closely spaced and deceleration lengths cannot be achieved, the District Traffic branch should be consulted for guidance.

(e) Storage Length -- At unsignalized intersections, storage length may be based on the number of turning vehicles likely to arrive in an average 2-minute period during the peak hour. At a minimum, space for 2 vehicles should be provided at 25 feet per vehicle. If the peak hour truck traffic is 10 percent or more, space for at least one passenger car and one truck should be provided. Bus usage may require a longer storage length and should be evaluated if their use is anticipated.

At signalized intersections, the storage length may be based on one and one-half to two times the average number of vehicles that would store per signal cycle depending on cycle length, signal phasing, and arrival and departure rates. At a minimum, storage length should be calculated in the same manner as unsignalized intersection. The District Traffic Branch should be consulted for this information.

When determining storage length, the end of the left-turn lane is typically placed at least 3 feet, but not more than 30 feet, from the nearest edge of shoulder of the intersecting roadway. Although often set by the placement of a crosswalk line or limit line, the end of the storage lane should always be located so that the appropriate turning template can be accommodated.

Table 405.2A
Bay Taper for Median Speed-change Lanes



	LENGTH OF TAPER - feet			OFFSET DISTANCE			
	60	90	120	DD' = 10'	DD' = 11'	DD' = 12'	
	Distance From Point "A"						
	-	-	-	0.00	0.00	0.00	
	5	7.5	10.0	0.16	0.17	0.19	
	10	15.0	20.0	0.62	0.69	0.75	
	15	22.5	30.0	1.41	1.55	1.69	
B'	20	30.0	40.0	2.50	2.75	3.00	B'
	30	45.0	60.0	5.00	5.50	6.00	
C'	40	60.0	80.0	7.50	8.25	9.00	C'
	45	67.5	90.0	8.59	9.45	10.31	
	50	75.0	100.0	9.38	10.31	11.25	
	55	82.5	110.0	9.84	10.83	11.81	
	60	90.0	120.0	10.00	11.00	12.00	

NOTES:

(1) The table gives offsets from a base line parallel to the edge of traveled way at intervals measured from point "A". Add "E" for measurements from edge of traveled way.

(2) Where edge of traveled way is a curve, neither base line nor taper between B & C will be a tangent. Use proportional offsets from B to C.

(3) The offset "E" is usually 2 ft along edge of traveled way for curbed medians; Use "E" = 0 ft. for striped medians.

Table 405.2B
Deceleration Lane Length

Design Speed (mph)	Length to Stop (ft)
30	235
40	315
50	435
60	530

(3) Double Left-turn Lanes. At signalized intersections on multilane conventional highways and on multilane ramp terminals, double left-turn lanes should be considered if the left-turn demand is 300 vehicles per hour or more. The lane widths and other design elements of left-turn lanes given under Index 405.2(2) applies to double as well as single left-turn lanes.

The design of double left-turn lanes can be accomplished by adding one or two lanes in the median. See "Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians", published by Headquarters, Division of Traffic Operations, for the various treatments of double left-turn lanes.

(4) Two-way Left-turn Lane (TWLTL). The TWLTL consists of a striped lane in the median of an arterial and is devised to address the special capacity and safety problems associated with high-density strip development. It can be used on 2-lane highways as well as multilane highways. Normally, the District Traffic Operations Branch should determine the need for a TWLTL.

The minimum width for a TWLTL shall be 12 feet (see Index 301.1). The preferred width is 14 feet. Wider TWLTL's are occasionally provided to conform with local agency standards. However, TWLTL's wider than 14 feet are not recommended, and in no case should the width of a TWLTL exceed 16 feet. Additional width may encourage drivers in opposite directions to use the TWLTL simultaneously.

405.3 Right-turn Channelization

(1) General. For right-turning traffic, delays are less critical and conflicts less severe than for left-turning traffic. Nevertheless, right-turn lanes can be justified on the basis of capacity, analysis, and crash experience.

In rural areas a history of high speed rear-end collisions may warrant the addition of a right-turn lane.

In urban areas other factors may contribute to the need such as:

- High volumes of right-turning traffic causing backup and delay on the through lanes.
- Conflicts between crossing pedestrians and right-turning vehicles and bicycles.
- Frequent rear-end and sideswipe collisions involving right-turning vehicles.

Where right-turn channelization is proposed, lower speed right-turn lanes should be provided to reduce the likelihood of conflicts between vehicles, pedestrians, and bicyclists.

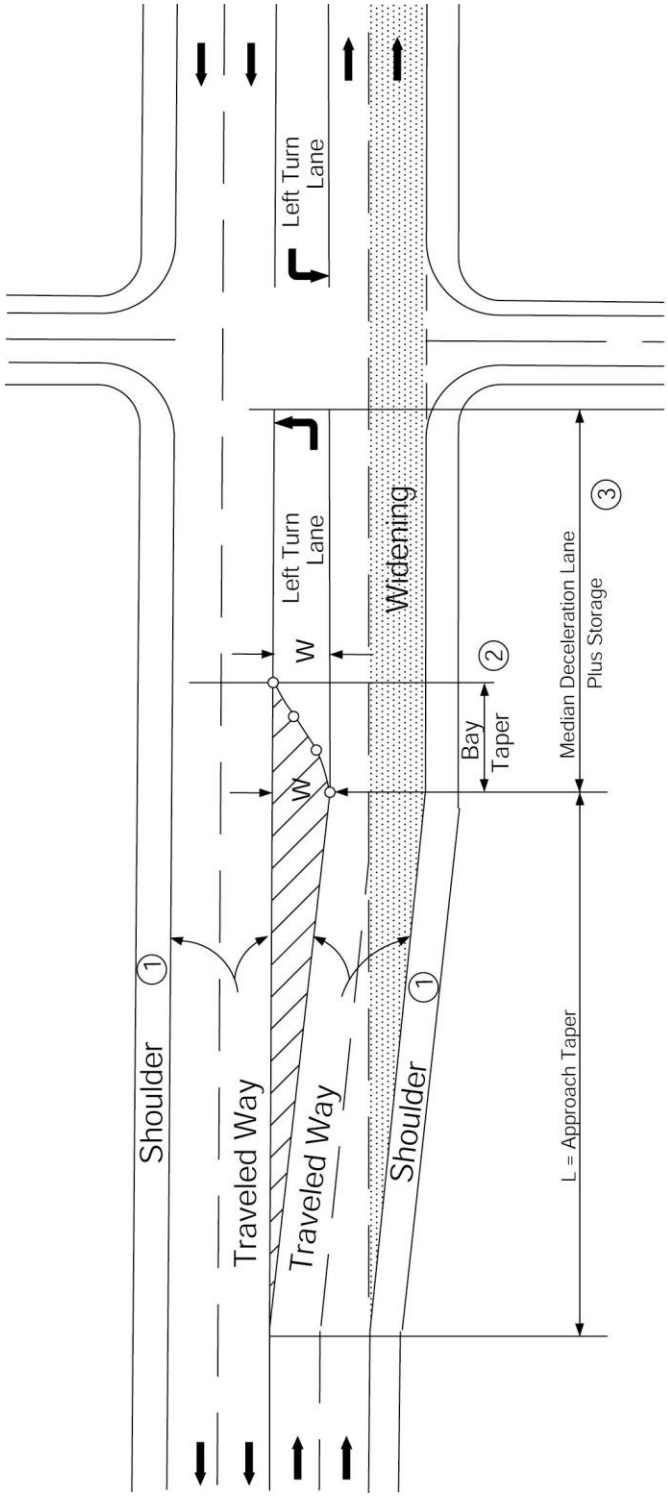
(2) Design Elements.

(a) Lane and Shoulder Width--**Index 301.1 shall be used for right-turn lane width requirements. Shoulder width shall be a minimum of 4 feet.** Although not desirable, lane and shoulder widths less than those given above can be considered for right-turn lanes under the following conditions pursuant to Index 82.2:

- In urban, city or town centers (rural main streets) with posted speeds less than 40 miles per hour in severely constrained situations, if truck or bus use is low, consideration may be given to reducing the right-turn lane width to 10 feet.
- Shoulder widths may also be considered for reduction under constricted situations. Whenever possible, at least a 2-foot shoulder should be provided where the right-turn lane is adjacent to a curb. Entire omission of the shoulder should only be considered in constrained situations and where an 11-foot lane can be constructed.

  Gutter pans can be included within a shoulder, but cannot be included as part of the travel lane width. Additional right of way for a future right-turn lane should be considered when an intersection is being designed.

Figure 405.2A
Standard Left-turn Channelization



EQUATION: L = Use WV, for $V \geq 45$mph ④
Or $WV^2/60$, for $V < 45$mph

Where L = Length of Approach Taper - feet
V = Design Speed - mph
W = Width of Median Lane - feet

NOTES:

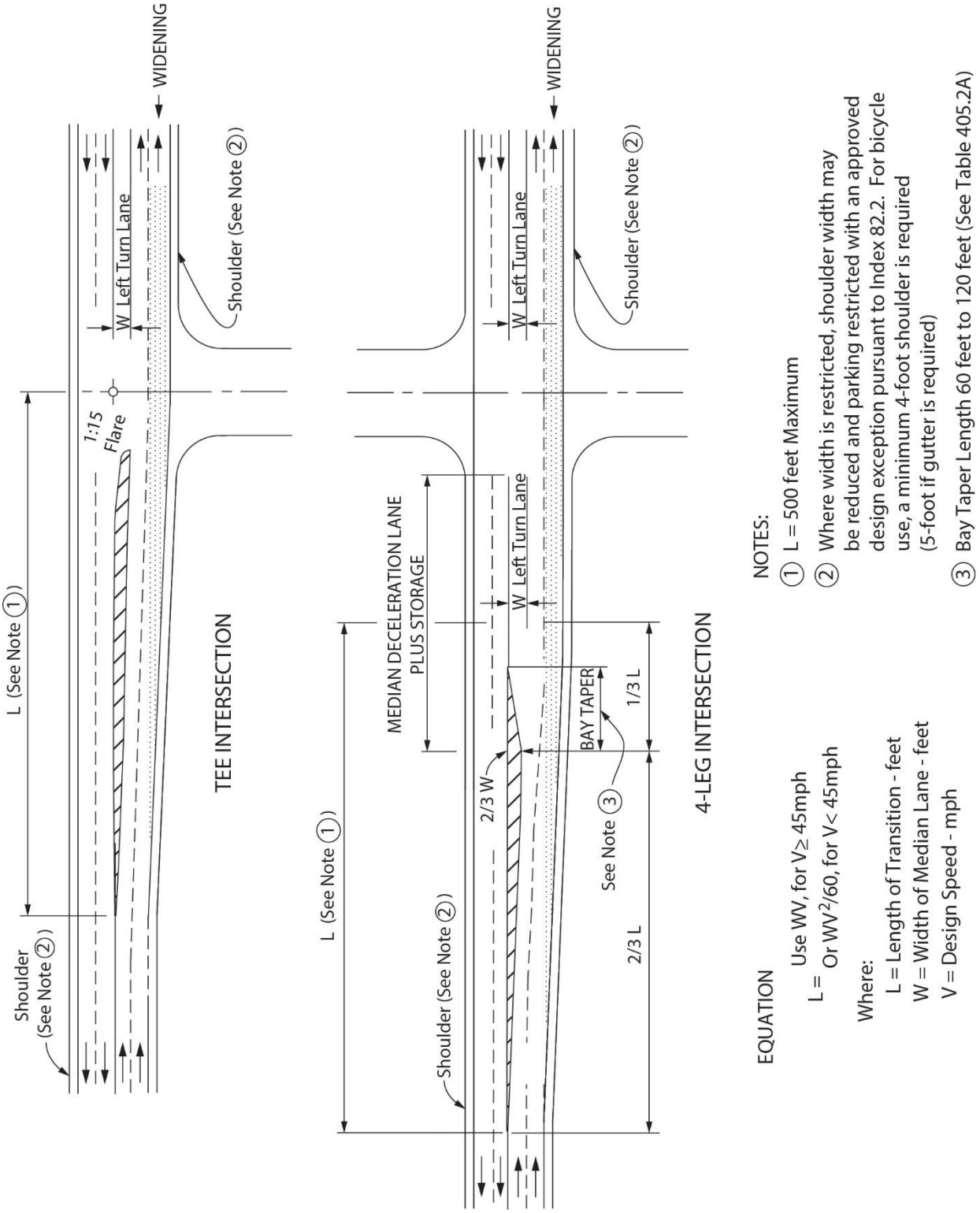
① Where width is restricted, shoulder width may be reduced and parking restricted with an approved design exception pursuant to Index 82.2.
For bicycle use, a minimum 4-foot shoulder is required (5-foot if gutter is present).

② Bay taper length = 60 feet to 120 feet. (See Table 405.2A)

③ For deceleration lane length see Table 405.2B.

④ Where both sides of roadway are widened, use a fraction of "W" that is proportional to widening on each side.

Figure 405.2B
Minimum Median Left-turn Channelization
(Widening on one Side of Highway)



NOTES:

① L = 500 feet Maximum

② Where width is restricted, shoulder width may be reduced and parking restricted with an approved design exception pursuant to Index 82.2. For bicycle use, a minimum 4-foot shoulder is required (5-foot if gutter is required)

③ Bay Taper Length 60 feet to 120 feet (See Table 405.2A)

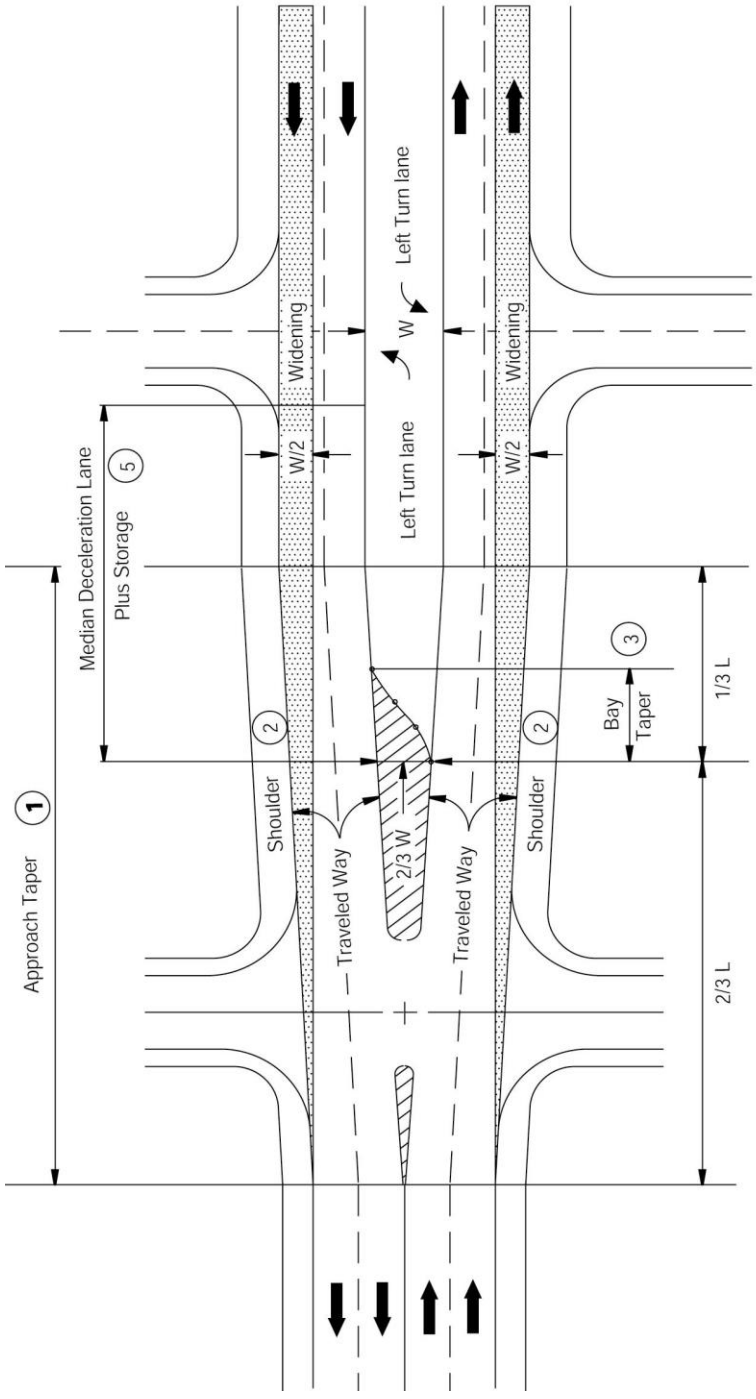
EQUATION

$L = \begin{matrix} \text{Use } WV, \text{ for } V \geq 45\text{mph} \\ \text{Or } WV^2/60, \text{ for } V < 45\text{mph} \end{matrix}$

Where:

L = Length of Transition - feet
W = Width of Median Lane - feet
V = Design Speed - mph

Figure 405.2C
Minimum Median Left-turn Channelization
(Widening on Both Sides in Urban Areas with Short Blocks)



NOTES:

① L = 500 feet Maximum

② Where width is restricted, shoulder width may be reduced and parking restricted with an approved design exception pursuant to Index 82.2. For bicycle use, a minimum 4 feet shoulder is required (5 feet if gutter is present).

③ Bay taper length = 60 feet to 120 feet. (See Table 405.2A)

④ Assumes equal widening each side. Where widening is unequal, use a fraction that is proportional to widening on each side.

⑤ For deceleration lane length see Table 405.2B.

EQUATION: ④

$L = \begin{cases} \text{Use } (1/2)WV, \text{ for } V \geq 45\text{mph} \\ \text{Or } WV^2/120, \text{ for } V < 45\text{mph} \end{cases}$

Where L = Length of Approach Taper - feet
W = Width of Median Lane - feet
V = Design Speed - mph

(b) Curve Radius--Where pedestrians are allowed to cross a free right-turning roadway, the curve radius should be such that the operating speed of vehicular traffic is no more than 20 miles per hour at the pedestrian crossing. See NCHRP Report 672, "Roundabouts: An Informational Guide" for guidance on the determination of design speed (fastest path) for turning vehicles. See Index 504.3(3) for additional information.

(c) Tapers--Approach tapers are usually unnecessary since main line traffic need not be shifted laterally to provide space for the right-turn lane. If, in some rare instances, a lateral shift were needed, the approach taper would use the same formula as for a left-turn lane.

Bay tapers are treated as a mirror image of the left-turn bay taper.

(d) Deceleration Lane Length--The conditions and principles of left-turn lane deceleration apply to right-turn deceleration. Where full deceleration is desired off the high-speed through lanes, the lengths in Table 405.2B should be used. Where partial deceleration is permitted on the through lanes because of limited right of way or other constraints, average running speeds in Table 405.2B may be reduced 10 miles per hour to 20 miles per hour for a lower entry speed. For example, if the main line speed is 50 miles per hour and a 10 miles per hour deceleration is permitted on the through lanes, the deceleration length may be that required for 40 miles per hour.

(e) Storage Length--Right-turn storage length is determined in the same manner as left-turn storage length. See Index 405.2(2)(e).

(3) Right-turn Lanes at Off-ramp Intersections. Diamond off-ramps with a free right-turn at the local street and separate right-turn off-ramps around the outside of a loop will likely cause conflict as traffic volumes increase. Serious conflicts occur when the right-turning vehicle must weave across multiple lanes on the local street in order to turn left at a major cross street close to the ramp terminal. Furthermore, free right-turns create sight distance issues for pedestrians and bicyclists crossing the off-ramp, or pedestrians crossing the local road. Also, rear-end collisions can occur as right-turning drivers slow down or stop waiting for a gap in local street traffic. Free right-turns usually end up with "YIELD", "STOP", or signal controls thus defeating their purpose of increasing intersection capacity.

405.4 Traffic Islands

A traffic island is an area between traffic lanes for channelization of bicycle and vehicle movements or for pedestrian refuge. An island may be defined by paint, raised pavement markers, curbs, pavement edge, or other devices. The California MUTCD should be referenced when considering the placement of traffic islands at signalized and unsignalized locations. For splitter island guidance at roundabouts, see Index 405.10(13).

Traffic islands usually serve more than one function. These functions may be:

(a) Channelization to confine specific traffic movements into definite channels;

(b) Divisional to separate traffic moving in the same or opposite direction; and

(c) Refuge, to aid users crossing the roadway.

Generally, islands should present the least potential conflict to approaching or crossing bicycles and vehicles, and yet perform their intended function.

(1) Design of Traffic Islands. Island sizes and shapes vary from one intersection to another. They should be large enough to command attention. Channelizing islands should not be less than 50 square feet in area, preferably 75 square feet. Curbed, elongated divisional median islands should not be less than 4 feet wide and 20 feet long. All traffic islands placed in the path of a pedestrian crossing must comply with DIB 82. See the Standard Plans for typical island passageway details.

The approach end of each island should be offset 3 feet to the left and 5 feet to the right of approaching traffic, using standard 1:15 parabolic flares, and clearly delineated so that it does not surprise the motorist or bicyclist. These offsets are in addition to the shoulder

widths shown in Table 302.1. Table 405.4 gives standard parabolic flares to be used in island design. On curved alignment, parabolic flares may be omitted for small triangular traffic islands whose sides are less than 25 feet long.

The approach nose of a divisional island should be highly visible day and night with appropriate use of signs (reflectorized or illuminated) and object markers. The approach nose should be offset 3 feet from the through traffic to minimize accidental impacts.

(2) Delineation of Traffic Islands. Generally, islands should present the least potential conflict to approaching traffic and yet perform their intended function. See Index 303.2 for appropriate curb type. Islands may be designated as follows:

(a) Raised paved areas outlined by curbs.

(b) Flush paved areas outlined by pavement markings.

(c) Unpaved areas (small unpaved areas should be avoided).

On facilities with posted speeds over 40 miles per hour, the use of any type of curb is discouraged. Where curbs are to be used, they should be located at or outside of the shoulder edge, as discussed in Index 303.5.

In rural areas, painted channelization supplemented with raised pavement markers may be more appropriate than a raised curbed channelization. This design is as forgiving as possible and decreases the consequence of a driver's or bicyclist's failure to detect or recognize the curbed island. Consideration for snow removal operations should be determined where appropriate.

In urban areas, posted speeds less than or equal to 40 miles per hour allow more frequent use of curbed islands. Local agency requirements and matching existing conditions are factors to consider.

(3) Pedestrian Refuge

Pedestrian refuge islands allow pedestrians to cross fewer lanes at a time while judging conflicts separately. They also provide a refuge so slower pedestrians can wait for a gap in traffic while reducing total crossing distance.

At unsignalized intersections in rural city/town centers (rural main streets), suburban, or urban areas, a pedestrian refuge should be provided between opposing traffic where pedestrians are allowed to cross 2 or more through traffic lanes in one direction of travel, at marked or unmarked crosswalks. Pedestrian islands at signalized crosswalks should be considered, taking into account crossing distance and pedestrian activity. Note that signalized pedestrian crossings must be timed to allow for pedestrians to cross. See the California MUTCD, Chapter 4E, for further guidance.

Traffic islands used as pedestrian refuge are to be large enough to provide a minimum of 6 feet in the direction of pedestrian travel, without exception.

All traffic islands placed in the path of a pedestrian crossing must be accessible, refer to DIB 82 and the Standard Plans for further guidance. An example of a traffic island that serves as a pedestrian refuge is shown on Figure 405.4.

405.5 Median Openings

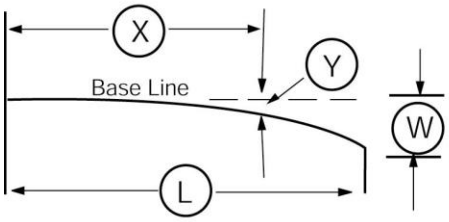
(1) General. Median openings, sometimes called crossovers, provide for crossings of the median at designated locations. Except for emergency passageways in a median barrier, median openings are not allowed on urban freeways.

Median openings on expressways or divided conventional highways should not be curbed except when the median between openings is curbed, or it is necessary for delineation of traffic signal standards and other necessary hardware, or for protection of pedestrians. In these special cases B4 curbs should be used. An example of a median opening design is shown on Figure 405.5.

(2) Spacing and Location. By a combination of interchange ramps and emergency passageways, provisions for access to the opposite side of a freeway may be provided for law enforcement, emergency, and maintenance vehicles to avoid extreme out-of-direction travel. Access should not be more frequent

Table 405.4

Parabolic Curb Flares Commonly Used



$$Y = \frac{W X^2}{L^2}$$

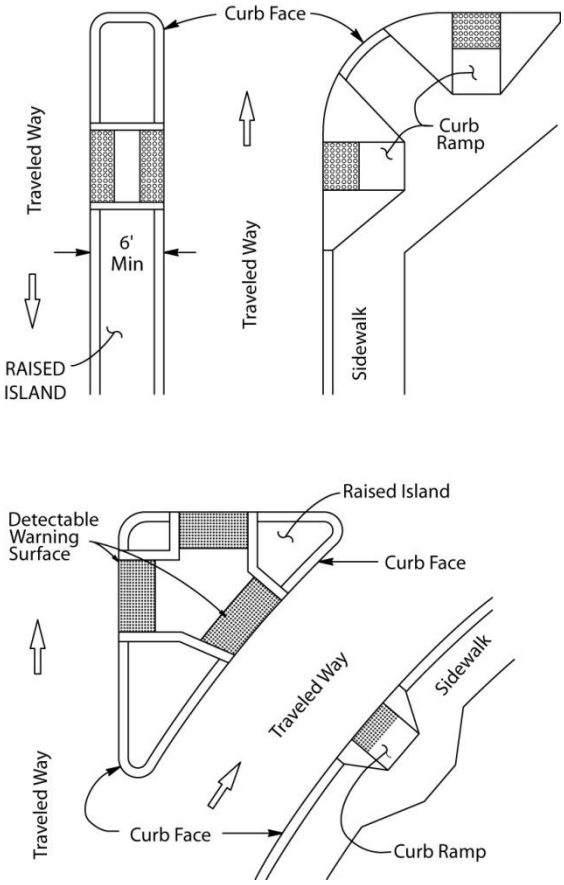
(L) = Length of flare in feet
(W) = Maximum offset in feet
(X) = Distance along base line in feet
(Y) = Offset from base line in feet

(W) is shown in table thus

OFFSET IN FEET FOR GIVEN "X" DISTANCE																
Distance (X) / Length of Flare (L)	10	15	20	25	30	40	45	50	60	70	75	80	90	100	110	120
1:5 FLARES																
25	0.80	1.80	3.20	5.00												
50	0.40		1.60		3.60	6.40		10.00								
1:10 FLARES																
50	0.20		0.80		1.80	3.20		5.00								
100	0.10		0.40		0.90	1.60		2.50	3.60	4.90		6.40	8.10	10.00		
1:15 FLARES																
45	0.15		0.59		1.33	2.37	3.00									
75	0.09		0.36		0.80	1.42		2.22	3.20	4.36	5.00					
90	0.07		0.30		0.67	1.19		1.85	2.67	3.63		4.74	6.00			
120	0.06		0.22		0.50	0.89		1.39	2.00	2.72		3.56	4.50	5.56	6.72	8.00

Figure 405.4

Pedestrian Refuge Island



than at three-mile intervals. See Traffic Safety Systems Guidance for additional information on the design of emergency passageways.

Emergency passageways should be located only where decision sight distance is available (see Table 201.7).

Median openings at close intervals on other types of highways create conflicts with high speed through traffic. Median openings should be spaced at intervals no closer than 1600 feet. If a median opening falls within 300 feet of an access opening, it should be placed opposite the access opening.

(3) *Length of Median Opening.* For any three or four-leg intersection on a divided highway, the length of the median opening should be at least as great as the width of the crossroads pavement, median width, and shoulders. An important factor in designing median openings is the path of the design vehicle making a minimum left turn at 5 miles per hour to 10 miles per hour. The length of median opening varies with width of median and angle of intersecting road.

Usually a median opening of 60 feet is adequate for 90 degree intersections with median widths of 22 feet or greater. When the median width is less than 22 feet, a median opening of 70 feet is needed. When the intersection angle is other than 90 degrees, the length of median opening should be established by using truck turn templates (see Index 404.3).

(4) *Cross Slope.* The cross slope in the median opening should be limited to 5 percent. Crossovers on curves with super elevation exceeding 5 percent should be avoided. This cross slope may be exceeded when an existing 2-lane roadbed is converted to a 4-lane divided highway. The elevation of the new construction should be based on the 5 percent cross slope requirement when the existing roadbed is raised to its ultimate elevation.

(5) *References.* For information related to the design of intersections and median openings, "A Policy on Geometric Design of Highways and Streets," AASHTO, should be consulted.

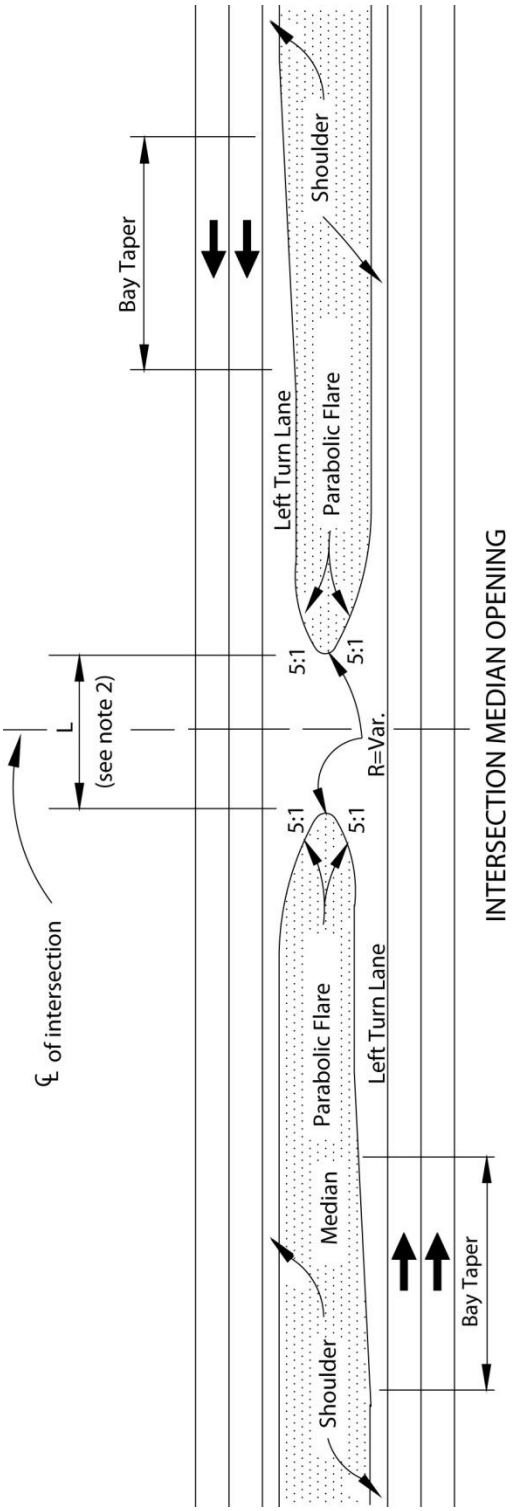
405.6 Access Control

The basic guidance which govern the extent to which access rights are to be acquired at interchanges (see Topic 104, Index 205.1 and 504.8 and the PDPM) also apply to intersections at grade on expressways. Cases of access control which frequently occur at intersections are shown in Figure 405.7. This illustration does not presume to cover all situations. Where required by traffic conditions, access should be extended in order to ensure proper operation of the expressway lanes. Reasonable variations which observe the basic principles referred to above are acceptable.

However, negative impacts on the mobility needs of pedestrians, bicyclists, equestrians, and transit users need to be assessed. Pedestrians and bicyclists are sensitive to additional out of direction travel.

Figure 405.5

Typical Design for Median Openings



NOTES:

① For length of bay taper, see Table 405.2A.

② L = Length of median opening: varies with width of median and angle of intersecting road. Usually for 90° intersection, L = 60 feet for median of 22 feet and wider. L = 70 feet for medians narrower than 22 feet.

③ See Index 405.2.

④ Pedeistrain and bicycle features are not shown on figure.

405.7 Public Road Intersections

The basic design to be used at right-angle public road intersections on the State Highway System is shown in Figure 405.7. The essential elements are sight distance (see Index 405.1) and the treatment of the right-turn on and off the main highway. Encroachment into opposing traffic lanes by the turning vehicle should be avoided or minimized.

(1) Right-turn Onto the Main Highway. The combination of a circular curve joined by a 2:1 taper on the crossroads and a 75-foot taper on the main highway is designed to fit the wheel paths of the appropriate turning template chosen by the designer.

It is desirable to keep the right-turn as tight as practical, so the "STOP" or "YIELD" sign on the minor leg can be placed close to the intersection.

(2) Right-turn Off the Main Highway. The combination of a circular curve joined by a 150-foot taper on the main highway and a 4:1 taper on the crossroads is designed to fit the wheel paths of the appropriate turning template and to move the rear of the vehicle off the main highway. Deceleration and storage lanes may be provided when necessary (see Index 405.3).

(3) Alternate Designs. Offsets are given in Figure 405.7 for right angle intersections. For skew angles, roadway curvature, and possibly other reasons, variations to the right-angle design are permitted, but the basic rule is still to approximate the wheel paths of the design vehicle.

A three-center curve is an alternate treatment that may be used at the discretion of the designer.

Intersections are major consideration in bicycle path design as well. See Indexes 403.6 and 1003.1(5) for general bicycle path intersection design guidance. Also see Section 5.3 of the AASHTO Guide for the Planning, Design, and Operation of Bicycle Facilities.

405.8 City Street Returns and Corner Radii

The pavement width and corner radius at city street intersections is determined by the type of vehicle to be accommodated and the mobility needs of pedestrians and bicyclists, taking into consideration the amount of available right of way, the types of adjoining land uses, the place types, the roadway width, and the number of lanes on the intersecting street.

At urban intersections, the California truck or the Bus Design Vehicle template may be used to determine the corner radius. Where STAA truck access is allowed, the STAA Design Vehicle template should be used giving consideration to factors mentioned above. See Index 404.3.

Smaller radii of 15 feet to 25 feet are appropriate at minor cross streets where few trucks or buses are turning. Local agency standards may be appropriate in urban and suburban areas.

Encroachment into opposing traffic lanes must be avoided.

405.9 Widening of 2-lane Roads at Signalized Intersections

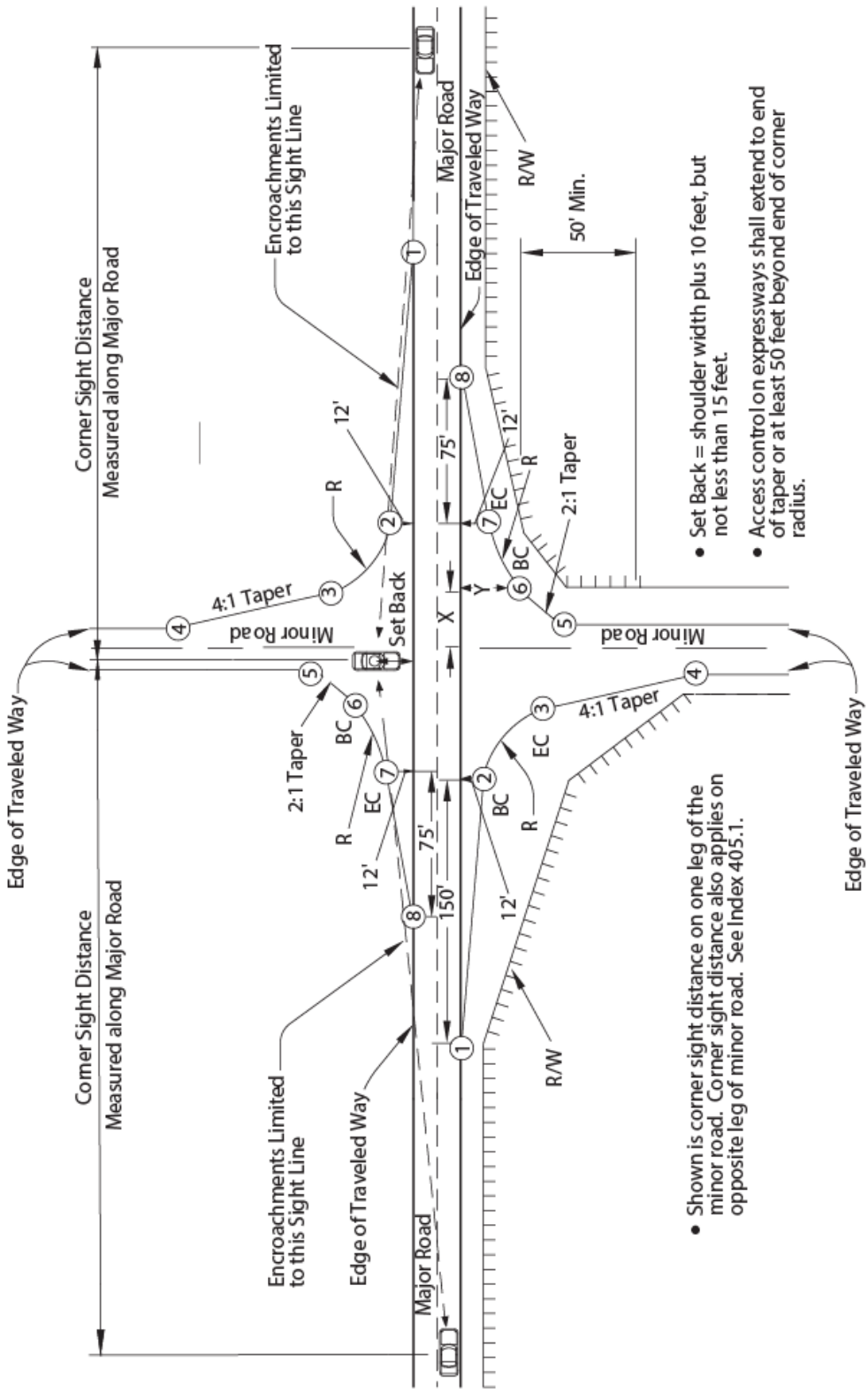
Two-lane State highways may be widened at intersections to 4-lanes whenever signals are installed. Sometimes it may be necessary to widen the intersecting road. The minimum design is shown in Figure 405.9. More elaborate treatment may be warranted by the volume and pattern of traffic movements. Unusual turning movement patterns may possibly call for a different shape of widening.

The impact on pedestrian and bicycle traffic mobility of larger intersections should be assessed before a decision is made to widen an intersection.

405.10 Roundabouts

Roundabout intersections on the State highway system must be developed and evaluated in accordance with National Cooperative Highway Research Program (NCHRP) Report 672 entitled "Roundabouts: An Informational Guide, 2nd ed." (NCHRP Guide 2) dated October 2010 and Traffic Operations Policy Directive (TOPD) Number 13-02. Also see Index 401.5 for general information and guidance. See Figure 405.10 Roundabout Geometric Elements for nomenclature associated with roundabouts. Signs, striping and markings at roundabouts are to comply with the California MUTCD.

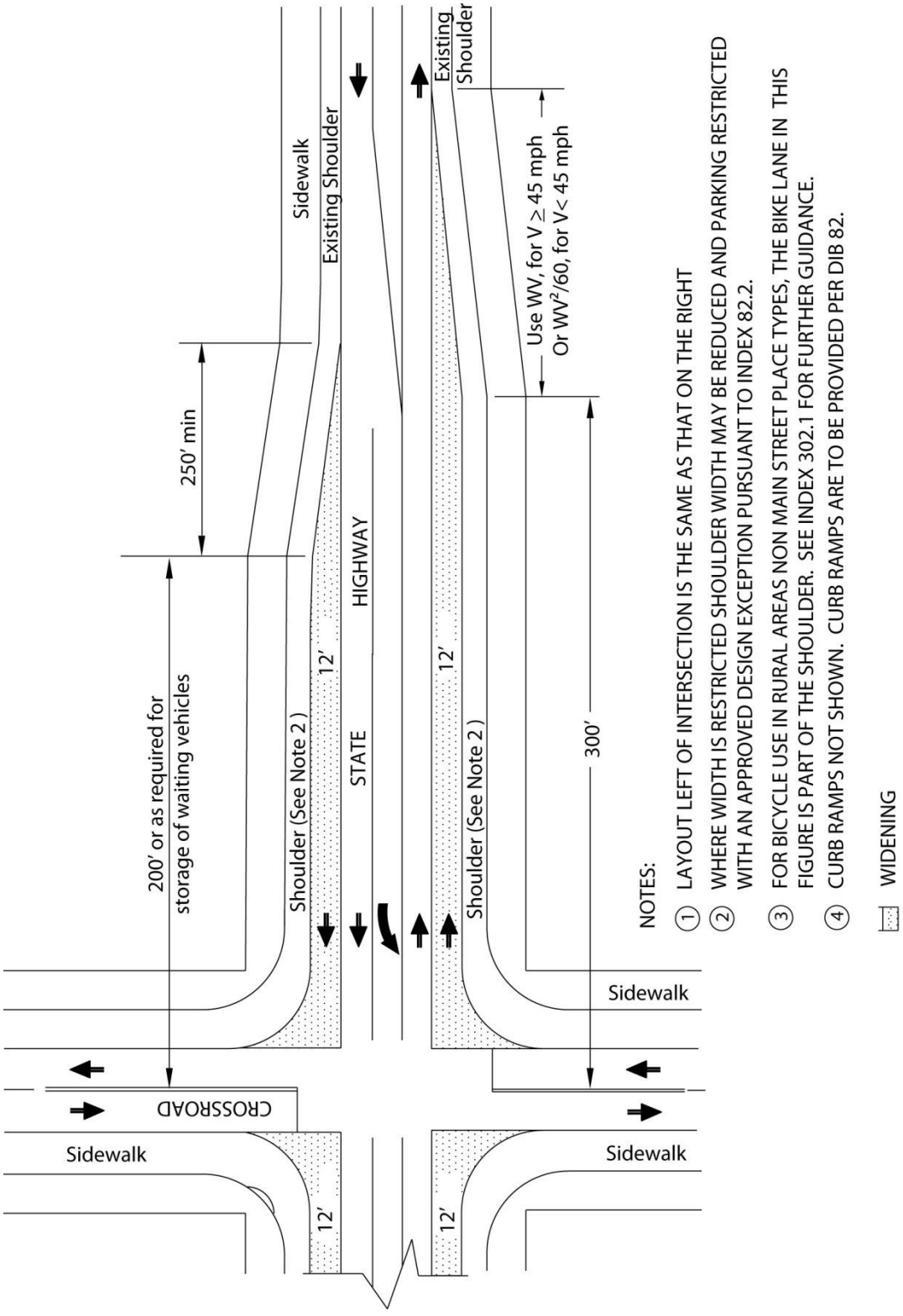
Figure 405.7
Public Road Intersections



Radius of Curve	Design Vehicle	Pt ①		Pt ②		Pt ③		Pt ④		Pt ⑤		Pt ⑥		Pt ⑦		Pt ⑧	
		X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
30'	Bus	204.20	0.0	54.20	12.0	27.49	34.63	12.0	96.58	12.0	40.66	18.23	28.21	40.32	12.0	115.32	0.0
40'	California	215.08	0.0	65.08	12.0	29.46	42.17	12.0	112.03	12.0	53.35	21.87	33.61	51.33	12.0	126.33	0.0
50'	STAA	226.09	0.0	76.09	12.0	31.57	49.71	12.0	127.98	12.0	75.63	30.31	39.01	67.13	12.0	142.13	0.0

X - Distance measured from centerline of minor road along major road - feet.
Y - Offset distance measured from edge of traveled way of major road to any given point - feet.

Figure 405.9
Widening of Two-lane Roads at Signalized Intersections



A roundabout is a form of circular intersection in which traffic travels counterclockwise around a central island and entering traffic must yield to the circulating traffic. Roundabouts feature, among other things, a central island, a circulatory roadway, and splitter islands on each approach. Roundabouts rely upon two basic and important operating principles:

(a) Speed reduction at the entry and through the intersection will be achieved through geometric design and,

(b) The yield-at-entry rule, which requires traffic entering the intersection to yield to traffic that is traveling in the circulatory roadway.

Benefits of roundabouts are:

- Fewer conflict points typically result in fewer collisions with less severity. Over half of vehicle to vehicle points of conflict associated with intersections are eliminated with the use of a roundabout. Additionally, a roundabout separates the points of conflict which eases the ability of the users to identify a conflict and helps prevent conflicts from becoming collisions.
- Roundabouts are designed to reduce the vehicular speeds at intersections. Lower speeds lessens the vehicular collision severity. Likewise, studies indicate that pedestrian and bicyclist collisions with motorized vehicles at lower speeds significantly reduce their severity.
- Roundabouts allow continuous free flow of vehicles and bicycles when no conflicts exist. This results in less noise and air pollution and reduces overall delays at roundabout intersections.

Except as indicated in this Index, the standards elsewhere in this manual do not apply to roundabouts. For the application of design standards, the approach ends of the splitter islands define the boundary of a roundabout intersection, see Figure 405.10. The design standards elsewhere in this manual apply to the approach legs beyond the approach ends of the splitter islands.

(1) Design Period.

First consider the design of a single lane roundabout per the design period guidance in Index 103.2. If a second lane is not needed until 10 or more years, it may be better to phase the improvements. Construct the first phase of the roundabout so at the 20-year design period, an additional lane can be easily added. In order to comply with the 20-year design period, the initial project must provide the right of way needed for utility relocations, a shared-use path designed for a Class I Bikeway, and all other features other than pavement, lighting, and striping in their ultimate locations.

In some locations, it may not be practical to build a single lane roundabout that will operate for 10 years. Geometric constraints and other conflicts may preclude widening to the ultimate configuration. In such cases, other intersection configurations or control strategies addressed in Index 401.5 may need to be considered.

When staging improvements, see NCHRP Guide 2, Section 6.12.

(2) Design Vehicles - See Topic 404.

The turning path for the design vehicle, see Index 404.5, dictates many of the roundabout dimensions. The design vehicle tracking and swept width are to be used when designing all the entries and exits, where design vehicles are unrestricted (see Index 404.2), and the circulatory roadway. The percentage of trucks and their lane utilization is an important consideration on multilane roundabouts when determining if the design will allow trucks to stay within their own lane or encroach into the adjacent lane. If permit vehicles larger than the design vehicle occasionally use the proposed roundabout, they can be accommodated by having removable signs or other removable features in the central island or around the circular path to ensure their swept path can negotiate the roundabout. Roundabouts should not be overdesigned for the occasional permit vehicle.

To accurately simulate the design vehicle swept width traveling through a roundabout, the minimum speed of the design vehicle used in computer simulation software (e.g., Auto

TURN) should be 10 miles per hour through the roundabout.

(3) Inscribed Circle Diameter.

At single lane roundabouts, the size of the inscribed circle is largely dependent upon the turning requirements of the design vehicle. The inscribed circle diameter (ICD) must be large enough to accommodate: (a) the STAA design vehicle for all roundabouts on the National Network and on Terminal Access routes; and, (b) the California Legal design vehicle on all non-STAA route intersections on California Legal routes and California Legal KPRA Advisory routes, while maintaining adequate deflection curvature to ensure appropriate travel speeds for smaller vehicles. The design vehicle is to navigate the roundabout with the front tractor wheels off the truck apron, if one is present. Transit vehicles, fire engines and single-unit delivery vehicles are also to be able to navigate the roundabout without using the truck apron, if one is present. The inscribed circle diameter for a single lane roundabout generally ranges between 105 feet to 150 feet to accommodate the California Legal design vehicle and 130 feet to 180 feet to accommodate the STAA design vehicle.

At multilane roundabouts, the inscribed circle diameter is to achieve adequate alignment of the natural vehicle path while maintaining deflection curvature to ensure appropriate travel speeds. To achieve both of these design objectives requires a slightly larger diameter than used for a single lane roundabout. The inscribed circle diameter for a multilane (2-lane) roundabout generally ranges between 150 feet to 220 feet to accommodate the California Legal design vehicle for non-STAA route intersections on California Legal routes and California Legal KPRA Advisory routes, and 165 feet to 220 feet to accommodate the STAA design vehicle for roundabouts on the National Network and on Terminal Access routes. Similar to a single lane roundabout, the design vehicle is to be able to navigate a multilane roundabout with the front tractor wheels staying off the truck apron, if one is present. Transit vehicles, fire engines and single-unit delivery vehicles are also to be able to navigate the roundabout without using the truck apron, if one is present.

The inscribed diameter ranges given above are typical values, design may be larger or smaller. Site location constraints and performance checks will determine if the diameter is appropriate for the location.

(4) Entry Speeds.

Lowering the speed of vehicles entering and traveling through the roundabout is a primary design objective that is achieved by approach alignment and entry geometry.

The following entry speeds should not be exceeded:

- Single lane entry, 25 miles per hour.
- Multilane entry, 30 miles per hour.

A bypass lane is not included in the number of entry lanes. A bypass prohibits entry into the circulatory roadway.

Entry speeds are to be determined through fastest path analysis. Fastest path is the smoothest, flattest path possible for a single vehicle in the absence of other traffic and ignoring all lane markings. The fastest path analysis should begin at least 165 feet from the inscribed circle diameter and should not bring the path closer than 3 feet from a stripe nor 5 feet from the face of a curb. These distances are minimums and the fastest path may occur further away from the curbs and striping depending on the roundabout configuration. For fastest path evaluation, see NCHRP Guide 2, Section 6.7.1.

(5) Exit Design.

Similar to entry design, exit design flexibility is required to achieve the optimal balance between competing design variables and project objectives to provide adequate capacity and, essentially, safety while minimizing excessive property impacts and costs. Thus, the selection of a curved versus tangential design is to be based upon the balance of each of these criteria. Exit design is influenced by the place type, pedestrian demand, bicyclist needs, the design vehicle

and physical constraints. The exit curb radii are usually larger than the entry curb radii in order to minimize the likelihood of congestion and crashes at the exits. However, the desire to minimize congestion at the exits needs to be balanced with the need to maintain an appropriate operating speed through the pedestrian crossing. Therefore, the exit path radius should not be significantly greater than the circulating path radius to ensure low speeds are maintained at the pedestrian crossing.

(6) Number of Legs Serving the Roundabout.

Intersections with more than four legs are often difficult to manage operationally. Roundabouts are a proven traffic control device in such situations. However, it is necessary to ensure that the design vehicle can maneuver through all unrestricted legs of the roundabout.

(7) Pedestrian Use.

Sidewalks around the circular roadway are to be designed as shared-use paths, see Index 405.10(8)(c). However, the guidance in Design Information Bulletin (DIB) 82 Pedestrian Accessibility Guidelines for Highway Projects must also be followed when designing these shared-use facilities around a roundabout. If there is a difference in the standards, the guidance in DIB 82 is to be followed. In addition,

(a) Pedestrian curb ramps need to be differentiated from bike ramps:

- The detectable warning surface (truncated domes) differentiates a pedestrian curb ramp from a bicycle ramp.
- Detectable warning surface is required on curb ramps. They are not to be used on a bike ramp.

(b) Truck aprons and mountable curbs are not to be placed in the pedestrian crossing areas.

(c) See the California MUTCD for the signs and markings used at roundabouts.

(d) At pedestrian crossing locations the accessibility design will be treated as a midblock pedestrian street crossing. See DIB 82 for more information.

(8) Bicyclist Use.

(a) General. Bicyclists may choose to travel in the circular roadway of a roundabout by taking a lane, while others may decide to travel using the shared-use path to bypass the circular roadway. Therefore, the approach and circular roadways, as well as the shared-use path all need to be designed for the mobility needs of bicyclists. See the California MUTCD for the signs and markings used at roundabouts.

(b) Bicyclist Use of the Circular Roadway. Single lane roundabouts do not require bicyclists to change lanes in the circular roadway to select the appropriate lane for their direction of travel, so they tend to be comfortable for bicyclists to use. Even two-lane roundabouts, which may have straighter paths of travel that can lead to faster vehicular traveling speeds, appear to be comfortable for bicyclists that prefer to travel like vehicles. Roundabouts that have more than two circular lanes can create complexities in signing and striping (see the California MUTCD for guidance), and their operating speed may cause some bicyclists to decide to bypass the circular roadway and use the bicycle ramp that provides access to the shared-use path around the roundabout.

(c) Bicyclists Use of the Shared-Use Path. The shared-use path is to be designed using the guidance in Index 1003.1 for Class I Bikeways and in NCHRP Guide 2 Section 6.8.2.2. However, the accessibility guidance in DIB 82 must also be followed when designing these shared-use facilities around a roundabout. If there is a difference in the standards, the accessibility guidance in DIB 82 is to be followed to ensure the facility is accessible to pedestrians with disabilities.

Bicycle ramps are to be located to avoid confusion as curb ramps for pedestrians. Also see Index 405.10(7) for guidance on how to differentiate the two types of ramps.

The design details and width of the ramp are also important to the bicyclist. Bicyclists approaching the bicycle ramp need to be provided the choice of merging left into the lane or moving right to use the bicycle ramp. Bicycle ramps should be placed at a 35 to 45 degree angle to the departure roadway and the sidewalk to enable the bicyclists to use the ramp and discourage bicyclists from entering the shared-use path at a speed that is detrimental to the pedestrians. The shared-use path should be designated as Class I Bikeways; however, appropriate regulatory signs may need to be posted if the local jurisdiction has a law(s) that prohibit bicyclists from riding on a sidewalk.

A landscape buffer or strip between the shared-use/Class I Bikeway and the circular roadway of the roundabout is needed and should be a minimum of 2 feet wide.

Pedestrian crossings may also be used by bicyclists; thus, these shared-use crossings need to be designed for both bicyclist and pedestrian needs.

(9) Transit Use.

Transit vehicles and buses will not have difficulty negotiating a roundabout when it has been designed using the California Legal design vehicle or the STAA design vehicle. However, to minimize passenger discomfort, a roundabout should be designed such that the transit vehicle or bus does not use the truck apron, if one is present.

(10) Stopping Sight Distance and Visibility.

See Index 201.1 for stopping sight distance guidance at roundabouts.

A domed or mounded central island, between 3.5 to 6 feet high, is needed to focus attention on the approach and through roundabout alignment. A domed central island provides a visual screen from downstream alignment and other distractions and provides a visual cue for vehicles approaching the roundabout.

In high speed environments, additional lighting of, and vertical elements in the central island (i.e., landscaping and esthetic features) may be needed.

(11) Speed Consistency.

Consistency in operating speeds between the various movements within the roundabout can minimize collisions between traffic streams. The operating speeds between competing traffic streams and between consecutive geometric elements should be minimized such that the maximum speed differential between them is no more than 15 miles per hour; it is preferred that the operating speed differential be less than 10 miles per hour.

(12) Path Alignment (Natural Path).

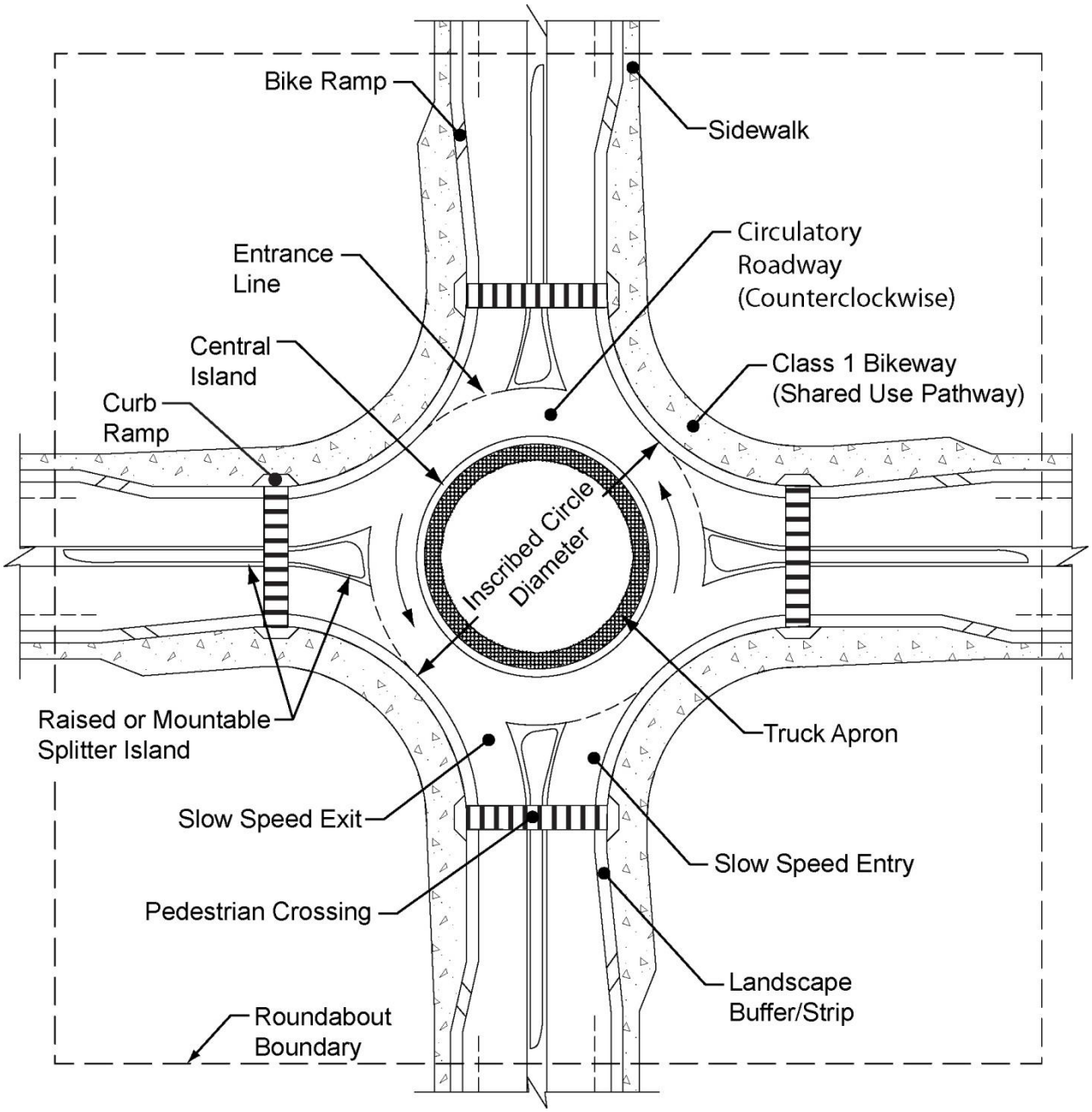
As two traffic streams approach the roundabout in adjacent lanes, drivers and bicyclists will be guided by lane markings up to the entrance line. At the yield point, they will continue along their natural trajectory into the circulatory roadway. The speed and orientation of the design vehicle at the entrance line determines what can be described as its natural path. The geometry of the exits also affects the natural path that the design vehicle travels. The natural path of two vehicles are not to overlap, see NCHRP Guide 2, Section 6.7.2.

(13) Splitter Islands.

Splitter islands (also called separator islands, divisional islands, or median islands) will be provided on all roundabouts. The purpose is to provide refuge for pedestrians, assist in controlling speeds, guide traffic into the roundabout, physically separate entering and exiting traffic streams, and deter wrongway movements.

The total length of the raised island should be at least 50 feet although 100 feet is desirable. On higher speed roadways, splitter island lengths of 150 feet or more is beneficial. Additionally, the splitter island should extend beyond the end of the exit curve to prevent

Figure 405.10
Roundabout Geometric Elements



NOTE:

This figure is provided to only show nomenclature and is not to be used for design details.

exiting traffic from crossing into the path of approaching traffic. The splitter island width should be a minimum of 6 feet at the pedestrian crossing to adequately provide refuge for pedestrians.

Posted speeds on the approach roadway greater than or equal to 45 miles per hour require the splitter island length, as measured from the inscribed circle diameter, to be 200 feet. In some instances, a longer splitter island may be desirable. Concrete curb is to be provided on the right side of the approach roadway equal to the length of the splitter island from the inscribed circle diameter.

(14) Access Control.

The access control standards in Index 504.3(3) and 504.8 apply to roundabouts at interchange ramp intersections. The dimensions shown in Index 504.8 are to be measured from the inscribed circle diameter.

Driveways should not be placed within 100 feet from the inscribed circle diameter.

(15) Lighting.

Lighting is required at all roundabouts. See NCHRP Report 672 Chapter 8, the Traffic Manual Chapter 9 as well as consult with the District Traffic Safety Engineer.

(16) Landscaping.

Landscaping should be designed such that drivers and bicyclists can observe the signing and shape of the roundabout as they approach, allowing adequate visibility for making decisions within the roundabout. The landscaping of the central island can enhance the intersection by making it a focal point, by promoting lower speeds and by breaking the headlight glare of oncoming vehicles or bicycles. It is desirable to create a domed or mounded central island, between 3.5 to 6 feet high, to increase the visibility of the intersection on the approach. Contact the District Landscape Architecture Unit to provide technical assistance in designing the roundabout landscaping. See Chapter 900 for additional Landscape Architecture requirements.

(17) Vertical Clearance.

The vertical clearance guidance provided in Index 309.2 applies to roundabouts.

(18) Drainage Design.

See Chapter 800 to 890 for further guidance.

(19) Maintenance.

Contact the District Maintenance Engineer and appropriate Regional Manager for maintenance strategies and practices including seasonal operations, maintenance resources, and specialized equipment. Maintenance responsibilities may also include multiple state, county, and city agencies where coordination of maintenance efforts and funding is needed.

Consider maintenance of the central island. Provide a maintenance vehicle pullout within the central island beyond the truck apron, so maintenance vehicles will not conflict with circulating trucks.

(20) Snow Areas.

In climate regions where snowfall requires the use of snow removal equipment, consider the equipment to be used. Design ICD's as well as entrance and exit geometry to accommodate snow removal equipment and plow limitations. Check with District Maintenance for their requirements and limitations. Geometric elements to consider that facilitate snow removal are; mountable curb, tapering the ends of curbs down to allow plows to ride over curbs, plowing accommodation in both directions, providing snow storage space within the central island, and providing minimum entry/exit widths to accommodate the plow blade. Mountable curb may be used if sidewalk/shared use path is not contiguous to the curb. Provide a planter or textured pavement between the path and the roadway. Snow storage areas must be designed to prevent snow melt from entering the circulating lanes where it can freeze. Snow storage areas must not block pedestrian paths.

(21) Utilities.

Utility access openings (manholes) should not be located within the traveled way within the boundary of the roundabout. Roundabouts do not have shoulders to accommodate traffic while manholes are accessed. Manholes should not be allowed within the circulating roadway to avoid closing down the intersection during access. If a manhole is absolutely necessary within the boundary of the inscribed diameter, place it in the central island and off of the truck apron. Provide a maintenance vehicle pullout to allow access to the manhole without blocking truck traffic.

Topic 406 - Ramp Intersection Capacity Analysis

The following procedure for ramp intersection analysis may be used to estimate the capacity of any signalized intersection where the phasing is relatively simple. It is useful in analyzing the need for additional turning and through traffic lanes. For a more complete analysis refer to the Highway Capacity Manual.

(a) Ramp Intersection Analysis--For the typical local street interchange there is usually a critical intersection of a ramp and the crossroads that establishes the capacity of the interchange. The capacity of a point where lanes of traffic intersect is 1500 vehicles per hour. This is expressed as intersecting lane vehicles per hour (ILV/hr). Table 406 gives values of ILV/hr for various traffic flow conditions.

If a single-lane approach at a normal intersection has a demand volume of 1000 vph, for example, then the intersecting single-lane approach volume cannot exceed 500 vph without delay.

The three examples that follow illustrate the simplicity of analyzing ramp intersections using this 1500 ILV/hr concept.

(b) Diamond Interchange--The critical intersection of a diamond type interchange must accommodate demands of three conflicting travel paths. As traffic volumes approach capacity, signalization will be needed. For the spread diamond (Figure 406A), basic capacity analysis is made on the assumption that 3-phase signalization is employed. For the tight diamond (Figure 406B), it is assumed that 4-phase signal timing is used.

(c) 2 Quadrant Cloverleaf--Because this interchange design (Figure 406C) permits 2-phase signalization, it will have higher capacities on the approach roadways. The critical intersection is shared two ways instead of three ways as in the diamond case.

Table 406

Vehicle Traffic Flow Conditions at Intersections at Various Levels of Operation

ILV/hr	Description
< 1200:	Stable flow with slight, but acceptable delay. Occasional signal loading may develop. Free midblock operations.
1200-1500:	Unstable flow with considerable delays possible. Some vehicles occasionally wait two or more cycles to pass through the intersection. Continuous backup occurs on some approaches.
1500 (Capacity):	Stop-and-go operation with severe delay and heavy congestion(1). Traffic volume is limited by maximum discharge rates of each phase. Continuous backup in varying degrees occurs on all approaches. Where downstream capacity is restrictive, mainline congestion can impede orderly discharge through the intersection.

NOTE:

(1) The amount of congestion depends on how much the ILV/hr value exceeds 1500. Observed flow rates will normally not exceed 1500 ILV/hr, and the excess will be delayed in a queue.

A "spread" diamond, where storage is available between ramp intersections.

LOCATION A

TRAFFIC FLOWS

NOTE: Traffic from field counts, A.M. peak

LANE VOLUMES (ILV/Hr)

* = handled in phase 1

Identify and Sum-up Critical Lane Volumes

PHASE 1: 650 ~~100~~ → 650 ILV/Hr.

PHASE 2: 450 → 450 ILV/Hr.

PHASE 3: ~~*~~ 300 → 300 ILV/Hr.

Total ----- 1400 ILV/Hr.

Evaluate Operating Level: (1400 ILV/Hr.)

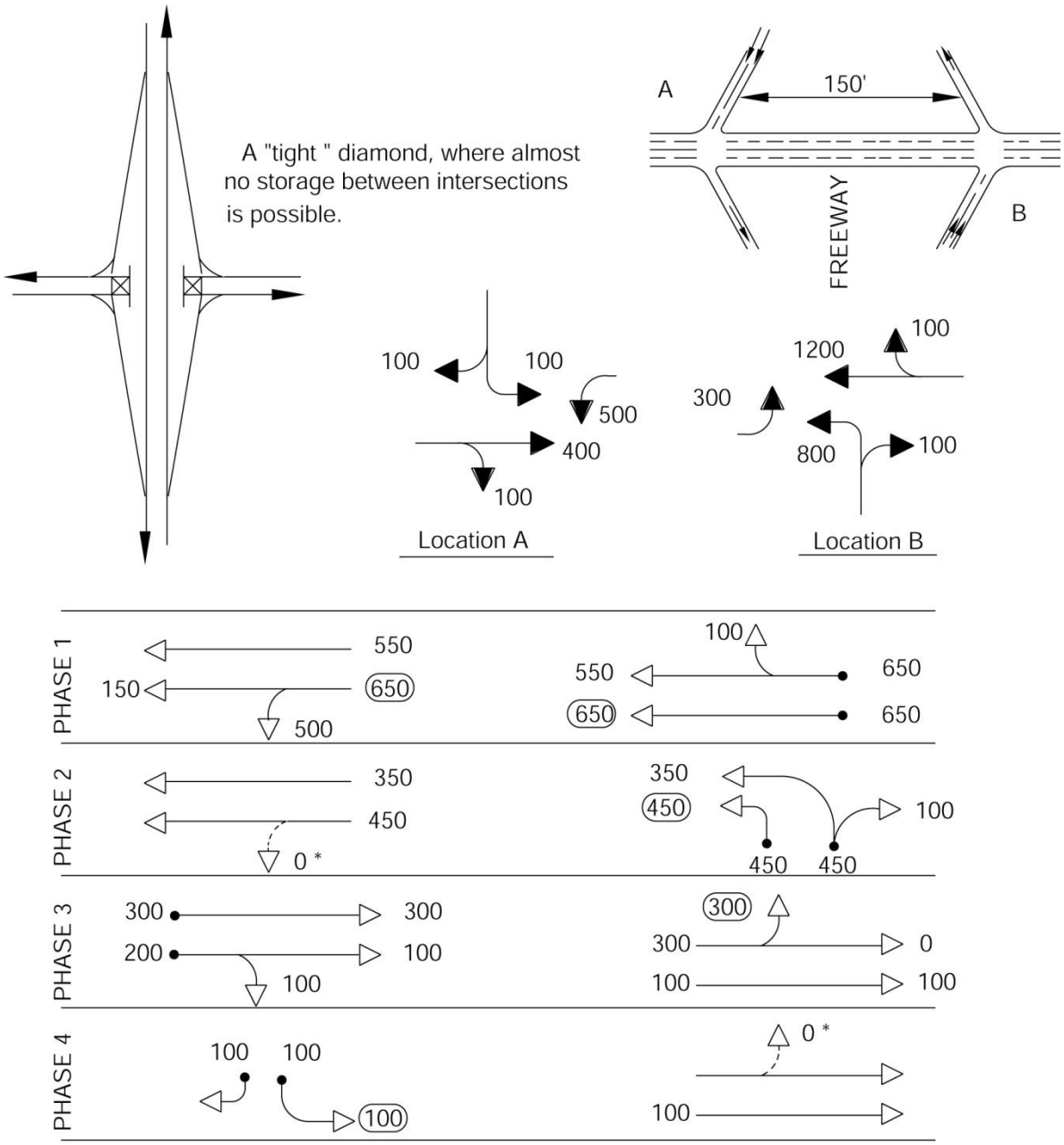
1200 < 1400 < 1500

The total volume of traffic which shares the intersection does not exceed capacity (1500), but is greater than 1200 ILV/Hr. threshold.
This suggests that congestion would be present and the intersection would be approaching capacity.

ILV = Intersecting Lane Vehicles.

Figure 406A
Spread Diamond

Figure 406B
Tight Diamond



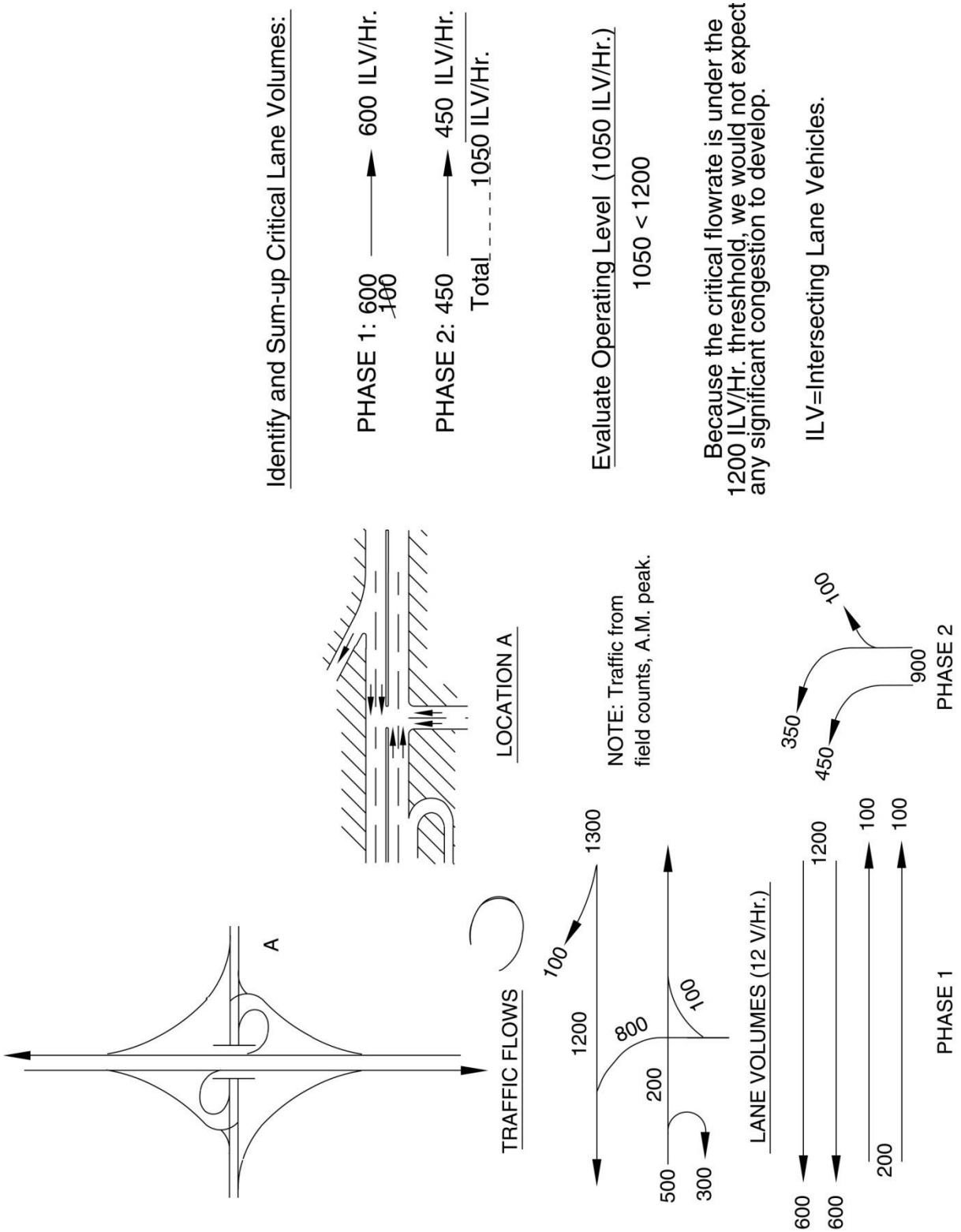
*NOTE: When no storage at all is permitted, left-turn movement is cleared during this phase.

Critical Lane Volumes:

650
450
300
100
1500 ILV/Hr.

ILV=Intersecting Lane Vehicles.

Figure 406C
Two-quadrant Cloverleaf



APPENDIX E

HCS Worksheets

EXISTING WORKSHEETS

HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Existing
Project Description	NB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	68	Opposing Demand Flow Rate, veh/h	59
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.04

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.50085	Speed Power Coefficient	0.59592
PF Slope Coefficient	-1.16103	PF Power Coefficient	0.82650
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	60.2

Vehicle Results

Average Speed, mi/h	60.2	Percent Followers, %	11.9
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.1
Vehicle LOS	A		

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Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	66	Opposing Demand Flow Rate, veh/h	77
Peak Hour Factor	0.73	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.04

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.51234	Speed Power Coefficient	0.58553
PF Slope Coefficient	-1.17005	PF Power Coefficient	0.82371
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	60.2

Vehicle Results

Average Speed, mi/h	60.2	Percent Followers, %	11.7
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.1
Vehicle LOS	A		

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Project Description	EB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	109	Opposing Demand Flow Rate, veh/h	91
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.52023	Speed Power Coefficient	0.57856
PF Slope Coefficient	-1.17610	PF Power Coefficient	0.82183
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	60.0

Vehicle Results

Average Speed, mi/h	60.0	Percent Followers, %	17.4
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.3
Vehicle LOS	A		

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Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	109	Opposing Demand Flow Rate, veh/h	91
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.52023	Speed Power Coefficient	0.57856
PF Slope Coefficient	-1.17610	PF Power Coefficient	0.82183
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	60.0

Vehicle Results

Average Speed, mi/h	60.0	Percent Followers, %	17.4
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.3
Vehicle LOS	A		

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Project Description	EB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	373	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.0

Vehicle Results

Average Speed, mi/h	58.0	Percent Followers, %	45.7
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	2.9
Vehicle LOS	B		

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Project Description	WB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	188	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.8

Vehicle Results

Average Speed, mi/h	58.8	Percent Followers, %	30.4
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.0
Vehicle LOS	A		

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Project Description	EB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	195	Opposing Demand Flow Rate, veh/h	218
Peak Hour Factor	0.62	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.57451	Speed Power Coefficient	0.53441
PF Slope Coefficient	-1.21426	PF Power Coefficient	0.80966
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.2

Vehicle Results

Average Speed, mi/h	59.2	Percent Followers, %	27.6
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.9
Vehicle LOS	A		

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Project Description	WB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	159	Opposing Demand Flow Rate, veh/h	142
Peak Hour Factor	0.85	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.54522	Speed Power Coefficient	0.55741
PF Slope Coefficient	-1.19444	PF Power Coefficient	0.81607
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.5

Vehicle Results

Average Speed, mi/h	59.5	Percent Followers, %	23.4
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.6
Vehicle LOS	A		

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Project Description	NB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	70	Opposing Demand Flow Rate, veh/h	65
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.04

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.50488	Speed Power Coefficient	0.59224
PF Slope Coefficient	-1.16422	PF Power Coefficient	0.82551
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	60.2

Vehicle Results

Average Speed, mi/h	60.2	Percent Followers, %	12.1
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.1
Vehicle LOS	A		

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Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	73	Opposing Demand Flow Rate, veh/h	78
Peak Hour Factor	0.73	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.04

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.51314	Speed Power Coefficient	0.58481
PF Slope Coefficient	-1.17067	PF Power Coefficient	0.82351
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	60.2

Vehicle Results

Average Speed, mi/h	60.2	Percent Followers, %	12.6
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.2
Vehicle LOS	A		

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Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	145	Opposing Demand Flow Rate, veh/h	98
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.52412	Speed Power Coefficient	0.57517
PF Slope Coefficient	-1.17904	PF Power Coefficient	0.82091
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.6

Vehicle Results

Average Speed, mi/h	59.6	Percent Followers, %	21.4
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.5
Vehicle LOS	A		

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Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	100	Opposing Demand Flow Rate, veh/h	148
Peak Hour Factor	0.94	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.54760	Speed Power Coefficient	0.55547
PF Slope Coefficient	-1.19612	PF Power Coefficient	0.81554
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	60.2

Vehicle Results

Average Speed, mi/h	60.2	Percent Followers, %	16.7
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.3
Vehicle LOS	A		

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Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	251	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.5

Vehicle Results

Average Speed, mi/h	58.5	Percent Followers, %	36.3
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	1.6
Vehicle LOS	A		

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Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	422	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.8

Vehicle Results

Average Speed, mi/h	57.8	Percent Followers, %	48.9
Segment Travel Time, minutes	1.04	Followers Density, followers/mi/ln	3.6
Vehicle LOS	B		

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Project Description	EB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	218	Opposing Demand Flow Rate, veh/h	216
Peak Hour Factor	0.62	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.57394	Speed Power Coefficient	0.53484
PF Slope Coefficient	-1.21390	PF Power Coefficient	0.80979
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.1

Vehicle Results

Average Speed, mi/h	59.1	Percent Followers, %	29.8
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.1
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Existing
Project Description	WB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	158	Opposing Demand Flow Rate, veh/h	159
Peak Hour Factor	0.85	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.55218	Speed Power Coefficient	0.55177
PF Slope Coefficient	-1.19932	PF Power Coefficient	0.81452
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.5

Vehicle Results

Average Speed, mi/h	59.5	Percent Followers, %	23.4
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.6
Vehicle LOS	A		

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EXISTING PLUS PROJECT WORKSHEETS

HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Existing Plus Project
Project Description	NB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	105	Opposing Demand Flow Rate, veh/h	112
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53134	Speed Power Coefficient	0.56898
PF Slope Coefficient	-1.18442	PF Power Coefficient	0.81923
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	60.0

Vehicle Results

Average Speed, mi/h	60.0	Percent Followers, %	17.0
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.3
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Existing Plus Project
Project Description	SB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	126	Opposing Demand Flow Rate, veh/h	118
Peak Hour Factor	0.73	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53406	Speed Power Coefficient	0.56668
PF Slope Coefficient	-1.18641	PF Power Coefficient	0.81861
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.8

Vehicle Results

Average Speed, mi/h	59.8	Percent Followers, %	19.6
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.4
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Existing Plus Project
Project Description	EB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	146	Opposing Demand Flow Rate, veh/h	111
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53098	Speed Power Coefficient	0.56928
PF Slope Coefficient	-1.18415	PF Power Coefficient	0.81932
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.6

Vehicle Results

Average Speed, mi/h	59.6	Percent Followers, %	21.7
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.5
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Existing Plus Project
Project Description	WB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	114	Opposing Demand Flow Rate, veh/h	149
Peak Hour Factor	0.94	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.54805	Speed Power Coefficient	0.55510
PF Slope Coefficient	-1.19644	PF Power Coefficient	0.81544
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.9

Vehicle Results

Average Speed, mi/h	59.9	Percent Followers, %	18.4
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.3
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Existing Plus Project
Project Description	EB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	503	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.30

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.6

Vehicle Results

Average Speed, mi/h	57.6	Percent Followers, %	53.6
Segment Travel Time, minutes	1.04	Followers Density, followers/mi/ln	4.7
Vehicle LOS	C		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Existing Plus Project
Project Description	WB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	275	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.4

Vehicle Results

Average Speed, mi/h	58.4	Percent Followers, %	38.4
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	1.8
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Existing Plus Project
Project Description	EB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	273	Opposing Demand Flow Rate, veh/h	324
Peak Hour Factor	0.62	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.60819	Speed Power Coefficient	0.51034
PF Slope Coefficient	-1.23467	PF Power Coefficient	0.80264
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.7

Vehicle Results

Average Speed, mi/h	58.7	Percent Followers, %	35.3
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.6
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Existing Plus Project
Project Description	WB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	236	Opposing Demand Flow Rate, veh/h	199
Peak Hour Factor	0.85	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.56771	Speed Power Coefficient	0.53958
PF Slope Coefficient	-1.20983	PF Power Coefficient	0.81112
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.0

Vehicle Results

Average Speed, mi/h	59.0	Percent Followers, %	31.3
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.3
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Existing Plus Project
Project Description	NB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	115	Opposing Demand Flow Rate, veh/h	128
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53885	Speed Power Coefficient	0.56267
PF Slope Coefficient	-1.18989	PF Power Coefficient	0.81751
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.9

Vehicle Results

Average Speed, mi/h	59.9	Percent Followers, %	18.3
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.4
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Existing Plus Project
Project Description	SB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	144	Opposing Demand Flow Rate, veh/h	129
Peak Hour Factor	0.73	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53917	Speed Power Coefficient	0.56240
PF Slope Coefficient	-1.19012	PF Power Coefficient	0.81744
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.6

Vehicle Results

Average Speed, mi/h	59.6	Percent Followers, %	21.6
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.5
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Existing Plus Project
Project Description	EB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	190	Opposing Demand Flow Rate, veh/h	127
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53840	Speed Power Coefficient	0.56304
PF Slope Coefficient	-1.18957	PF Power Coefficient	0.81762
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.3

Vehicle Results

Average Speed, mi/h	59.3	Percent Followers, %	26.3
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.8
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Existing Plus Project
Project Description	WB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	130	Opposing Demand Flow Rate, veh/h	194
Peak Hour Factor	0.94	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.56578	Speed Power Coefficient	0.54106
PF Slope Coefficient	-1.20855	PF Power Coefficient	0.81154
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.7

Vehicle Results

Average Speed, mi/h	59.7	Percent Followers, %	20.6
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.4
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Existing Plus Project
Project Description	EB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	577	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.34

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.4

Vehicle Results

Average Speed, mi/h	57.4	Percent Followers, %	57.4
Segment Travel Time, minutes	1.05	Followers Density, followers/mi/ln	5.8
Vehicle LOS	C		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Existing Plus Project
Project Description	WB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	359	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.0

Vehicle Results

Average Speed, mi/h	58.0	Percent Followers, %	44.8
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	2.8
Vehicle LOS	B		

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Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Existing Plus Project
Project Description	EB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	310	Opposing Demand Flow Rate, veh/h	339
Peak Hour Factor	0.62	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.61232	Speed Power Coefficient	0.50756
PF Slope Coefficient	-1.23699	PF Power Coefficient	0.80180
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.6

Vehicle Results

Average Speed, mi/h	58.6	Percent Followers, %	38.3
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	2.0
Vehicle LOS	B		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2020
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Existing Plus Project
Project Description	WB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	247	Opposing Demand Flow Rate, veh/h	226
Peak Hour Factor	0.85	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.57734	Speed Power Coefficient	0.53229
PF Slope Coefficient	-1.21608	PF Power Coefficient	0.80906
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.9

Vehicle Results

Average Speed, mi/h	58.9	Percent Followers, %	32.5
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.4
Vehicle LOS	A		

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NEAR-TERM
WORKSHEETS

HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Near-Term Plus Project
Project Description	NB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	110	Opposing Demand Flow Rate, veh/h	116
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53312	Speed Power Coefficient	0.56747
PF Slope Coefficient	-1.18572	PF Power Coefficient	0.81882
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.9

Vehicle Results

Average Speed, mi/h	59.9	Percent Followers, %	17.7
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.3
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Near-Term Plus Project
Project Description	SB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	130	Opposing Demand Flow Rate, veh/h	123
Peak Hour Factor	0.73	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53664	Speed Power Coefficient	0.56451
PF Slope Coefficient	-1.18829	PF Power Coefficient	0.81802
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.7

Vehicle Results

Average Speed, mi/h	59.7	Percent Followers, %	20.1
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.4
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Near-Term Plus Project
Project Description	EB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	153	Opposing Demand Flow Rate, veh/h	118
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53401	Speed Power Coefficient	0.56672
PF Slope Coefficient	-1.18637	PF Power Coefficient	0.81862
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.5

Vehicle Results

Average Speed, mi/h	59.5	Percent Followers, %	22.5
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.6
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Near-Term Plus Project
Project Description	WB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	120	Opposing Demand Flow Rate, veh/h	156
Peak Hour Factor	0.94	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.55117	Speed Power Coefficient	0.55258
PF Slope Coefficient	-1.19862	PF Power Coefficient	0.81474
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.8

Vehicle Results

Average Speed, mi/h	59.8	Percent Followers, %	19.2
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.4
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Near-Term Plus Project
Project Description	EB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	527	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.31

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.5

Vehicle Results

Average Speed, mi/h	57.5	Percent Followers, %	54.9
Segment Travel Time, minutes	1.04	Followers Density, followers/mi/ln	5.0
Vehicle LOS	C		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Near-Term Plus Project
Project Description	WB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	287	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.3

Vehicle Results

Average Speed, mi/h	58.3	Percent Followers, %	39.4
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	1.9
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Near-Term Plus Project
Project Description	EB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	285	Opposing Demand Flow Rate, veh/h	339
Peak Hour Factor	0.62	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.61232	Speed Power Coefficient	0.50756
PF Slope Coefficient	-1.23699	PF Power Coefficient	0.80180
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.7

Vehicle Results

Average Speed, mi/h	58.7	Percent Followers, %	36.4
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.8
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - Near-Term Plus Project
Project Description	WB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	247	Opposing Demand Flow Rate, veh/h	208
Peak Hour Factor	0.85	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.57113	Speed Power Coefficient	0.53696
PF Slope Coefficient	-1.21207	PF Power Coefficient	0.81039
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.9

Vehicle Results

Average Speed, mi/h	58.9	Percent Followers, %	32.3
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.4
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Near-Term Plus Project
Project Description	NB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	120	Opposing Demand Flow Rate, veh/h	132
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.54051	Speed Power Coefficient	0.56129
PF Slope Coefficient	-1.19108	PF Power Coefficient	0.81714
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.8

Vehicle Results

Average Speed, mi/h	59.8	Percent Followers, %	18.9
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.4
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Near-Term Plus Project
Project Description	SB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	148	Opposing Demand Flow Rate, veh/h	134
Peak Hour Factor	0.73	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.54165	Speed Power Coefficient	0.56034
PF Slope Coefficient	-1.19190	PF Power Coefficient	0.81688
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.6

Vehicle Results

Average Speed, mi/h	59.6	Percent Followers, %	22.1
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.5
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Near-Term Plus Project
Project Description	EB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	199	Opposing Demand Flow Rate, veh/h	133
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.54124	Speed Power Coefficient	0.56068
PF Slope Coefficient	-1.19161	PF Power Coefficient	0.81697
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.2

Vehicle Results

Average Speed, mi/h	59.2	Percent Followers, %	27.3
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.9
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Near-Term Plus Project
Project Description	WB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	136	Opposing Demand Flow Rate, veh/h	203
Peak Hour Factor	0.94	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.56931	Speed Power Coefficient	0.53835
PF Slope Coefficient	-1.21088	PF Power Coefficient	0.81078
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.6

Vehicle Results

Average Speed, mi/h	59.6	Percent Followers, %	21.4
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.5
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Near-Term Plus Project
Project Description	EB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	604	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.36

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.3

Vehicle Results

Average Speed, mi/h	57.3	Percent Followers, %	58.6
Segment Travel Time, minutes	1.05	Followers Density, followers/mi/ln	6.2
Vehicle LOS	C		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Near-Term Plus Project
Project Description	WB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	376	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.0

Vehicle Results

Average Speed, mi/h	58.0	Percent Followers, %	45.9
Segment Travel Time, minutes	1.04	Followers Density, followers/mi/ln	3.0
Vehicle LOS	B		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Near-Term Plus Project
Project Description	EB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	324	Opposing Demand Flow Rate, veh/h	353
Peak Hour Factor	0.62	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.19

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.61637	Speed Power Coefficient	0.50488
PF Slope Coefficient	-1.23922	PF Power Coefficient	0.80098
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.5

Vehicle Results

Average Speed, mi/h	58.5	Percent Followers, %	39.5
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	2.2
Vehicle LOS	B		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2023
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - Near-Term Plus Project
Project Description	WB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	258	Opposing Demand Flow Rate, veh/h	236
Peak Hour Factor	0.85	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.58095	Speed Power Coefficient	0.52961
PF Slope Coefficient	-1.21837	PF Power Coefficient	0.80829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.9

Vehicle Results

Average Speed, mi/h	58.9	Percent Followers, %	33.4
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.5
Vehicle LOS	A		

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CUMULATIVE YEAR 2043
WORKSHEETS

HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Without Project
Project Description	NB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	110	Opposing Demand Flow Rate, veh/h	148
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.54747	Speed Power Coefficient	0.55558
PF Slope Coefficient	-1.19603	PF Power Coefficient	0.81557
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.9

Vehicle Results

Average Speed, mi/h	59.9	Percent Followers, %	17.9
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.3
Vehicle LOS	A		

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Project Description	SB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	105	Opposing Demand Flow Rate, veh/h	123
Peak Hour Factor	0.73	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53664	Speed Power Coefficient	0.56451
PF Slope Coefficient	-1.18829	PF Power Coefficient	0.81802
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	60.0

Vehicle Results

Average Speed, mi/h	60.0	Percent Followers, %	17.2
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.3
Vehicle LOS	A		

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Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Without Project
Project Description	EB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	176	Opposing Demand Flow Rate, veh/h	146
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.54673	Speed Power Coefficient	0.55618
PF Slope Coefficient	-1.19551	PF Power Coefficient	0.81574
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.4

Vehicle Results

Average Speed, mi/h	59.4	Percent Followers, %	25.2
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.7
Vehicle LOS	A		

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Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Without Project
Project Description	WB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	149	Opposing Demand Flow Rate, veh/h	180
Peak Hour Factor	0.94	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.56054	Speed Power Coefficient	0.54514
PF Slope Coefficient	-1.20504	PF Power Coefficient	0.81268
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.5

Vehicle Results

Average Speed, mi/h	59.5	Percent Followers, %	22.6
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.6
Vehicle LOS	A		

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Analyst	VRPA Technologies, Inc.	Date	3/25/2020
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Project Description	EB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	601	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.35

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.3

Vehicle Results

Average Speed, mi/h	57.3	Percent Followers, %	58.5
Segment Travel Time, minutes	1.05	Followers Density, followers/mi/ln	6.1
Vehicle LOS	C		

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Agency	Kings County	Analysis Year	2043
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Project Description	WB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	303	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.2

Vehicle Results

Average Speed, mi/h	58.2	Percent Followers, %	40.7
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	2.1
Vehicle LOS	B		

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Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Without Project
Project Description	EB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	315	Opposing Demand Flow Rate, veh/h	352
Peak Hour Factor	0.62	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.19

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.61592	Speed Power Coefficient	0.50518
PF Slope Coefficient	-1.23898	PF Power Coefficient	0.80107
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.5

Vehicle Results

Average Speed, mi/h	58.5	Percent Followers, %	38.8
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	2.1
Vehicle LOS	B		

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Analyst	VRPA Technologies, Inc.	Date	3/25/2020
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Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Without Project
Project Description	WB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	256	Opposing Demand Flow Rate, veh/h	229
Peak Hour Factor	0.85	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.57855	Speed Power Coefficient	0.53139
PF Slope Coefficient	-1.21685	PF Power Coefficient	0.80880
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.9

Vehicle Results

Average Speed, mi/h	58.9	Percent Followers, %	33.3
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.5
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Without Project
Project Description	NB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	112	Opposing Demand Flow Rate, veh/h	104
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.52708	Speed Power Coefficient	0.57262
PF Slope Coefficient	-1.18126	PF Power Coefficient	0.82022
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.9

Vehicle Results

Average Speed, mi/h	59.9	Percent Followers, %	17.8
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.3
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Without Project
Project Description	SB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	116	Opposing Demand Flow Rate, veh/h	126
Peak Hour Factor	0.73	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.53792	Speed Power Coefficient	0.56345
PF Slope Coefficient	-1.18921	PF Power Coefficient	0.81773
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.9

Vehicle Results

Average Speed, mi/h	59.9	Percent Followers, %	18.5
Segment Travel Time, minutes	1.00	Followers Density, followers/mi/ln	0.4
Vehicle LOS	A		

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Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Without Project
Project Description	EB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	233	Opposing Demand Flow Rate, veh/h	158
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.55198	Speed Power Coefficient	0.55193
PF Slope Coefficient	-1.19918	PF Power Coefficient	0.81457
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.0

Vehicle Results

Average Speed, mi/h	59.0	Percent Followers, %	30.7
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.2
Vehicle LOS	A		

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Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Without Project
Project Description	WB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	162	Opposing Demand Flow Rate, veh/h	238
Peak Hour Factor	0.94	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.58156	Speed Power Coefficient	0.52916
PF Slope Coefficient	-1.21875	PF Power Coefficient	0.80816
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.4

Vehicle Results

Average Speed, mi/h	59.4	Percent Followers, %	24.4
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.7
Vehicle LOS	A		

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Project Description	EB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	680	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.40

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.2

Vehicle Results

Average Speed, mi/h	57.2	Percent Followers, %	61.9
Segment Travel Time, minutes	1.05	Followers Density, followers/mi/ln	7.4
Vehicle LOS	C		

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Project Description	WB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	404	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.24

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.9

Vehicle Results

Average Speed, mi/h	57.9	Percent Followers, %	47.8
Segment Travel Time, minutes	1.04	Followers Density, followers/mi/ln	3.3
Vehicle LOS	B		

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Project Description	WB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	404	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.24

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.9

Vehicle Results

Average Speed, mi/h	57.9	Percent Followers, %	47.8
Segment Travel Time, minutes	1.04	Followers Density, followers/mi/ln	3.3
Vehicle LOS	B		

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Analyst	VRPA Technologies, Inc.	Date	3/25/2020
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Project Description	WB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	254	Opposing Demand Flow Rate, veh/h	256
Peak Hour Factor	0.85	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.58755	Speed Power Coefficient	0.52479
PF Slope Coefficient	-1.22248	PF Power Coefficient	0.80690
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.9

Vehicle Results

Average Speed, mi/h	58.9	Percent Followers, %	33.3
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.4
Vehicle LOS	A		

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Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Plus Project
Project Description	NB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	146	Opposing Demand Flow Rate, veh/h	148
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.54747	Speed Power Coefficient	0.55558
PF Slope Coefficient	-1.19603	PF Power Coefficient	0.81557
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.6

Vehicle Results

Average Speed, mi/h	59.6	Percent Followers, %	22.1
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.5
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Plus Project
Project Description	SB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	166	Opposing Demand Flow Rate, veh/h	164
Peak Hour Factor	0.73	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.55445	Speed Power Coefficient	0.54995
PF Slope Coefficient	-1.20089	PF Power Coefficient	0.81402
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.4

Vehicle Results

Average Speed, mi/h	59.4	Percent Followers, %	24.3
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.7
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Plus Project
Project Description	EB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	213	Opposing Demand Flow Rate, veh/h	167
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.55537	Speed Power Coefficient	0.54922
PF Slope Coefficient	-1.20152	PF Power Coefficient	0.81382
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.1

Vehicle Results

Average Speed, mi/h	59.1	Percent Followers, %	28.9
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	1.0
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Plus Project
Project Description	WB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	170	Opposing Demand Flow Rate, veh/h	217
Peak Hour Factor	0.94	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.57425	Speed Power Coefficient	0.53460
PF Slope Coefficient	-1.21410	PF Power Coefficient	0.80972
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.3

Vehicle Results

Average Speed, mi/h	59.3	Percent Followers, %	25.1
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.7
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Plus Project
Project Description	EB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	732	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.43

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	8.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.0

Vehicle Results

Average Speed, mi/h	57.0	Percent Followers, %	64.0
Segment Travel Time, minutes	1.05	Followers Density, followers/mi/ln	8.2
Vehicle LOS	D		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Plus Project
Project Description	WB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	390	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.23

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.9

Vehicle Results

Average Speed, mi/h	57.9	Percent Followers, %	46.9
Segment Travel Time, minutes	1.04	Followers Density, followers/mi/ln	3.2
Vehicle LOS	B		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Plus Project
Project Description	EB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	392	Opposing Demand Flow Rate, veh/h	458
Peak Hour Factor	0.62	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.23

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.64340	Speed Power Coefficient	0.48790
PF Slope Coefficient	-1.25310	PF Power Coefficient	0.79559
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.2

Vehicle Results

Average Speed, mi/h	58.2	Percent Followers, %	44.8
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	3.0
Vehicle LOS	B		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Friday PM - CY 2043 Plus Project
Project Description	WB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	334	Opposing Demand Flow Rate, veh/h	286
Peak Hour Factor	0.85	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.59681	Speed Power Coefficient	0.51819
PF Slope Coefficient	-1.22807	PF Power Coefficient	0.80498
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.5

Vehicle Results

Average Speed, mi/h	58.5	Percent Followers, %	39.8
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	2.3
Vehicle LOS	B		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Plus Project
Project Description	NB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	157	Opposing Demand Flow Rate, veh/h	167
Peak Hour Factor	0.82	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.55553	Speed Power Coefficient	0.54909
PF Slope Coefficient	-1.20163	PF Power Coefficient	0.81378
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.5

Vehicle Results

Average Speed, mi/h	59.5	Percent Followers, %	23.4
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.6
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Plus Project
Project Description	SB 16th Avenue between Jackson Avenue and Jersey Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	188	Opposing Demand Flow Rate, veh/h	177
Peak Hour Factor	0.73	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.55934	Speed Power Coefficient	0.54608
PF Slope Coefficient	-1.20423	PF Power Coefficient	0.81294
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.3

Vehicle Results

Average Speed, mi/h	59.3	Percent Followers, %	26.6
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.8
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Plus Project
Project Description	EB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	278	Opposing Demand Flow Rate, veh/h	188
Peak Hour Factor	0.96	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.56349	Speed Power Coefficient	0.54284
PF Slope Coefficient	-1.20702	PF Power Coefficient	0.81204
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.8

Vehicle Results

Average Speed, mi/h	58.8	Percent Followers, %	34.8
Segment Travel Time, minutes	1.02	Followers Density, followers/mi/ln	1.6
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Plus Project
Project Description	WB Jersey Avenue between SR 41 and 18th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	191	Opposing Demand Flow Rate, veh/h	284
Peak Hour Factor	0.94	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.59625	Speed Power Coefficient	0.51858
PF Slope Coefficient	-1.22774	PF Power Coefficient	0.80509
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.2

Vehicle Results

Average Speed, mi/h	59.2	Percent Followers, %	27.7
Segment Travel Time, minutes	1.01	Followers Density, followers/mi/ln	0.9
Vehicle LOS	A		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Plus Project
Project Description	EB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	835	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.49

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	9.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	56.8

Vehicle Results

Average Speed, mi/h	56.8	Percent Followers, %	67.7
Segment Travel Time, minutes	1.06	Followers Density, followers/mi/ln	9.9
Vehicle LOS	D		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Plus Project
Project Description	WB Jersey Avenue between 18th Avenue and 17th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	513	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.91	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.30

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.82302	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.29558	PF Power Coefficient	0.76140
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	57.6

Vehicle Results

Average Speed, mi/h	57.6	Percent Followers, %	54.1
Segment Travel Time, minutes	1.04	Followers Density, followers/mi/ln	4.8
Vehicle LOS	C		

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HCS7 Two-Lane Highway Report

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Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Plus Project
Project Description	EB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	444	Opposing Demand Flow Rate, veh/h	471
Peak Hour Factor	0.62	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.26

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.64651	Speed Power Coefficient	0.48606
PF Slope Coefficient	-1.25457	PF Power Coefficient	0.79498
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.0

Vehicle Results

Average Speed, mi/h	58.0	Percent Followers, %	48.2
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	3.7
Vehicle LOS	B		

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HCS7 Two-Lane Highway Report

Project Information

Analyst	VRPA Technologies, Inc.	Date	3/25/2020
Agency	Kings County	Analysis Year	2043
Jurisdiction	Kings County	Time Period Analyzed	Saturday PM - CY 2043 Plus Project
Project Description	WB Jersey Avenue between 17th Avenue and 16th Avenue	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5280
Lane Width, ft	12	Shoulder Width, ft	4
Speed Limit, mi/h	55	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	344	Opposing Demand Flow Rate, veh/h	324
Peak Hour Factor	0.85	Total Trucks, %	3.00
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.2
Speed Slope Coefficient	3.60800	Speed Power Coefficient	0.51047
PF Slope Coefficient	-1.23456	PF Power Coefficient	0.80268
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.4
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	58.4

Vehicle Results

Average Speed, mi/h	58.4	Percent Followers, %	40.8
Segment Travel Time, minutes	1.03	Followers Density, followers/mi/ln	2.4
Vehicle LOS	B		

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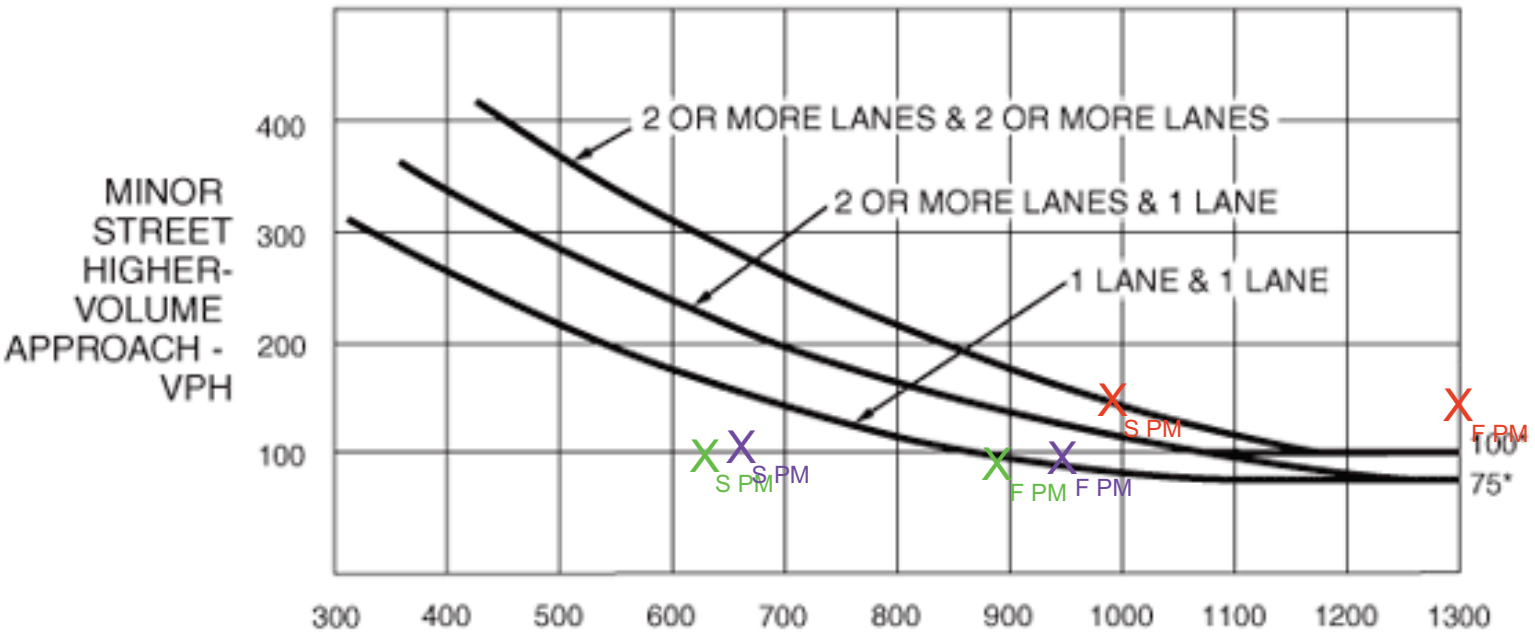
APPENDIX F

Signal Warrant Worksheets

JERSEY AVENUE / SR 41

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



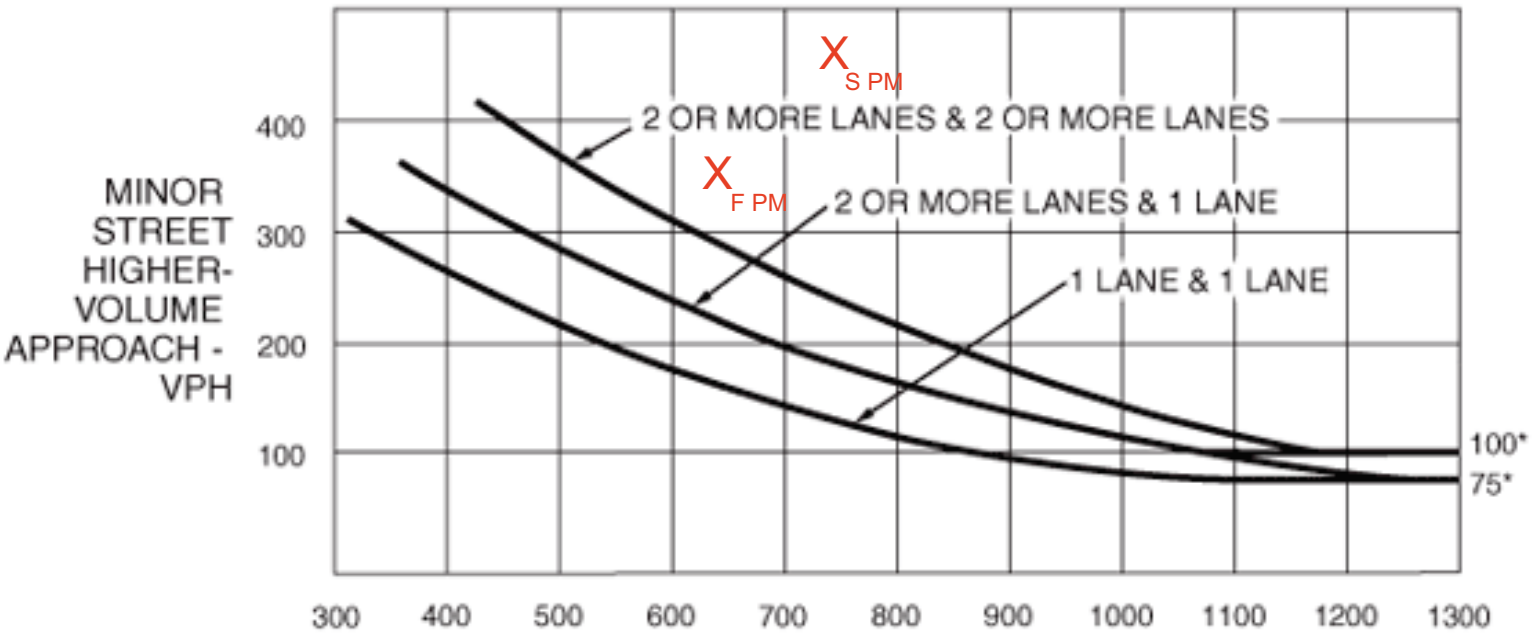
*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

LEGEND
X F PM X S PM Existing Plus Project
X F PM X S PM Near-Term Plus Project
X F PM X S PM Cumulative Year 2043 Plus Project

JERSEY AVENUE / 18TH AVENUE

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

LEGEND
$X_{F\,PM}$ $X_{S\,PM}$ Cumulative Year 2043 Plus Project

APPENDIX C

AIR QUALITY AND GHG MODELING FILES

Land Uses - Tachi Palace Development

Land Uses - Phase 1A							
Proposed Development	**CalEEMod Land Use Type**	**CalEEMod Land Use Subtype**	**Size**	**Units**	**Lot Size** (acre)	**Square Feet**	**Population** (# employees or residents)
Casino Expansion	Commercial	Commercial User Defined	44.418	1000sq ft	0.5	44,418	0
Parking Expansion	Parking	Parking Lot	1,000	spaces	5	400,000	0
Parking Expansion	Parking	Unenclosed Parking Structure with Elevator	1,000	spaces	3	400,000	0
Hotel Expansion	Recreational	Hotel	200	Room	1.5	140,000	0
Event Center	Recreational	Recreation User Defined	8.582	1000sq ft	2	8,582	0
Yokut Gas Expansion	Retail	Convenience Market With Gas Pumps	6	1000sq ft	0.08	6,000	0
Water/Wastewater Treatment Facility	Industrial	General Light Industry	100	1000sq ft	2	100,000	0

CalEEMod Default Construction Schedule and Equipment List - Tachi Palace Development Project

Construction Schedule					
Sub-Phase	**Start Date**	**End Date**	**Number of Days per Week**	Total Days	**Notes**
Demolition	1/1/2023	1/1/2023	5	0	Demolition involves removing buildings or structures.
Site Preparation	1/1/2023	3/24/2023	5	60	Site Preparation involves clearing vegetation (grubbing and tree/stump removal) and removing stones and other unwanted material or debris prior to grading.
Grading	3/25/2023	6/16/2023	5	60	Grading involves the cut and fill of land to ensure that the proper base and slope is created for the foundation.
Building Construction	6/17/2023	12/27/2024	5	400	Building Construction involves the construction of the foundation, structures and buildings.
Paving	12/28/2024	2/21/2025	5	40	Paving involves the laying of concrete or asphalt such as in parking lots, roads, driveways, or sidewalks.
Architectural Coating	2/22/2025	4/18/2025	5	40	Architectural Coating involves the application of coatings to both the interior and exterior of buildings or structures, the painting of parking lot or parking garage striping, associated signage and curbs, and the painting of the walls or other components such as stair railings inside parking structures.

Equipment List						
Sub-Phase	**Equipment**	**Quantity (from CalEEMod defaults)**	**Usage Hours per Day**	**Horsepower**	**Load Factor**	**Engine Tier (If known)**
Demolition	Concrete/Industrial Saws	1	8	81	0.73	Default
	Excavators	3	8	158	0.38	Default
	Rubber Tired Dozers	2	8	247	0.4	Default
Site Preparation	Rubber Tired Dozers	3	8	247	0.4	Default
	Tractors/Loaders/Backhoes	4	8	97	0.37	Default
Grading	Excavators	2	8	158	0.38	Default
	Graders	1	8	187	0.41	Default
	Rubber Tired Dozers	1	8	247	0.4	Default
	Scrapers	2	8	367	0.48	Default
	Tractors/Loaders/Backhoes	2	8	97	0.37	Default
Building Construction	Cranes	1	7	231	0.29	Default
	Forklifts	3	8	89	0.2	Default
	Generator Sets	1	8	84	0.74	Default
	Tractors/Loaders/Backhoes	3	7	97	0.37	Default
	Welders	1	8	46	0.45	Default
Paving	Pavers	2	8	130	0.42	Default
	Paving Equipment	2	8	132	0.36	Default
	Rollers	2	8	80	0.38	Default
Architectural Coating	Air Compressors	1	6	78	0.48	Default

CalEEMod Default Construction Schedule and Equipment List - Tachi Palace Development Project

Soil Transported for Construction			
Soil Quantity for Construction - Building area	Imported	[cubic yards]	0
	Exported	[cubic yards]	0

Total Acres Graded		
Grading - Roads and Building area	10.00	acres

Construction Phase	Units	Value
Demolition	Demolished Building Square Feet	0

Construction Trips						
Sub-Phase Name	Worker One-way Trip Number (trips/day)	Vendor One-way Trip Number (trips/day)	Hauling One-way Trip Number (total trips) (Note: If haul trips are not known, please provide average haul capacity of trucks or we can use CalEEMod default for truck	Worker Trip Length (miles/trip)	Vendor Trip Length (miles/trip)	Hauling Trip Length (miles/trip)
Demolition	15	0	0	16.8	6.6	20
Site Preparation	18	0	0	16.8	6.6	20
Grading	20	0	0	16.8	6.6	20
Building Construction	457	180	0	16.8	6.6	20
Paving	15	0	0	16.8	6.6	20
Architectural Coating	91	0	0	16.8	6.6	20

Operational Assumptions - Tachi Palace Development Project

Project build-out date or date of first occupancy	2026

Will there be an emergency generator on site or any other use of diesel fuel?	No	
If so, please provide the following for each generator if available	Emegency Gen	Boiler
Number	1	2
Fuel	CNG	CNG
Size (horsepower)	2923	
Load Factor	0.73	
Boiler Ratio		0.5
Annual Heat Input		8760
Total number of hours per year	30	

Transportation

Land Use	Size Metric	Project Trips (rate/size/day)		
		Weekday	Saturday	Sunday
Convenience Market With Gas Pumps	pumps	364.5	364.5	364.5
General Light Industry	1000sq ft	0	0	0
Hotel	Room	10.4	10.4	10.4
Parking Lot	spaces	0	0	0
Unenclosed Parking Structure with Elevator	spaces	0	0	0
Commercial User Defined	1000sq ft	10.4	10.4	10.4
Recreation User Defined	1000sq ft	131.1	131.1	131.1

Area Sources

Fireplaces/Hearths

Land Use Type	Woodstoves		Fireplaces		
	Catalytic	Non-Catalytic	Wood	Gas	Propane
	0	0	0	0	0

Consumer Products

Emission Factors	Value	Units
General Emission Factor	1.62E-05	lb ROG/sq ft/day
Degreaser Emissions Factor (Parking)	3.542E-07	lb ROG/sq ft/day
Pesticides/Fertilizer Emissions factor (City Park/Golf Course)	5.152E-08	lb ROG/sq ft/day

Landscaping equipment	No landscaping equipment to be used

Energy Use

Land Use Type	Energy Use				
	Electricity			Natural Gas	
	Title 24	Non Title 24	Lighting	Title 24	Non Title 24
	kWh/1000sqft/yr			kBtu/1000sqft/yr	
Convenience Market With Gas Pumps	2.14	2.30	3.71	8.62	2.08
General Light Industry	1.96	4.16	2.70	17.03	3.84
Hotel	4.13	2.30	1.51	17.99	7.16
Parking Lot	0.00	0.00	0.35	0.00	0.00
Unenclosed Parking Structure with Elevator	0.00	0.19	1.75	0.00	0.00
Commercial User Defined	4.13	2.30	1.51	17.99	7.16
Recreation User Defined	4.13	2.30	1.51	17.99	7.16

Operational Assumptions - Tachi Palace Development Project

Water Use

Land Use Type	Water Use	
	Indoor	Outdoor
	gal/year	
Convenience Market With Gas Pumps	444,435	272,396
General Light Industry	23,125,000	0
Hotel	5,073,354	563,706
Parking Lot	0	0
Unenclosed Parking Structure with Elevator	0	0
Commercial User Defined	5,073,354	563,706
Recreation User Defined	5,073,354	563,706

Solid Waste

Land Use Type	Solid Waste Generation Rate
	tons/yr
Convenience Market With Gas Pumps	18.03
General Light Industry	124
Hotel	109.5
Parking Lot	0
Unenclosed Parking Structure with Elevator	0
Commercial User Defined	109.5
Recreation User Defined	109.5

Land Use Change	Vegetation Type	Initial Acres	Final Acres

Sequestration	Tree Type	Number of trees
Will the Project plant new trees?	No	N/A

Mitigation Measures

Construction Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Off-Road Equipment	Equipment Type	Engine Tier / DPF Level	N/A
Fugitive Dust	Soil Stabilizer for Unpaved Roads	PM10 (% Reduction)	10%
		PM2.5 (% Reduction)	10%
	Replace Ground Cover Of Area Disturbed	PM10 (% Reduction)	N/A
		PM2.5 (% Reduction)	N/A
	Water Exposed Area	Frequency (per day)	2
		PM10 (% Reduction)	55%
		PM2.5 (% Reduction)	55%
	Unpaved Road Mitigation	Moisture Content (%)	N/A
		Vehicle speed (mph)	15
	Clean Paved Road	% PM Reduction	N/A

Traffic Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Land Use & Site Enhancement			
Land Use	Increase Density	Dwelling Units/acre	N/A
		Jobs/Job acre	
	Increase Diversity	Yes/No	
	Improve Walkability Design	Intersection/Square Miels	
	Improve Destination Accessibility	Distance to Dwntwn/Job Ctr (Miles)	
	Increase Transit Accessibility	Distance to Transit Station (Miles)	
	Integrate Below Market Rate Housing	% Dwelling Units Below Market Rate	
Neighborhood Enhancements	Improve Pedestrian Network		
	Provide Traffic Calming Measures	% Streets with Improvement	
		% Intersection with Improvement	
	Implement NEV Network	Yes/No	
Parking Policy/Pricing	Limit Parking Supply	% Reduction in Spaces	
	Unbundle parking Costs	Monthly Parking Costs ($)	
	On-Street Market Pricing	% Increase in Price	
Transit Improvements	Provide BRT System	% Lines BRT	
	Expand Transit Network	% Increase Transit Coverage	
	Increase Transit Frequency	Level of Implementation	
		% Reduction in Headways	
Commute			
Commute Trip	Implement Trip Reduction Program	% employee eligible	100
		Program Type	Voluntary
	Transit Subsidy	% employee eligible	N/A
		Daily Transit Subsidy Amount ($)	
	Implement Employee Parking "Cash-Out"	% employee eligible	
	Workplace Parking Charge	% employee eligible	
		Daily Parking Charge ($)	
	Encourage Telecommuting and Alternative Work schedules	% employee work 9/80	
		% employee work 4/40	
		% employee telecommute 1.5 days	
	Market Commute Trip Reduction Option	% employee eligible	
	Employee Vanpool/Shuttle	% employee eligible	
		% vanpool mode share	
	Provide Ride Sharing Program	% employee eligible	
School Trip	Implement School Bus Program	% family using	

Area Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Hearth	Natural Gas Hearth/No Hearth	Yes/No	N/A
Architectural Coating	Use low VOC Paint (Residential Interior)	EF (g/L)	N/A
	Use low VOC Paint (Residential Exterior)	EF (g/L)	N/A
	Use low VOC Paint (Non-residential interior)	EF (g/L)	N/A
	Use low VOC Paint (Non-residential exterior)	EF (g/L)	N/A
	Use low VOC Paint (Parking)	EF (g/L)	N/A
Landscape Equipment	% Electric Lawnmower	%	N/A
	% Electric Leafblower	%	N/A
	% Electric Chainsaw	%	N/A
Consumer Products for General Category	Use Low VOC Cleaning Supplies	Yes/No	Yes

Energy Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Building Energy	Exceed Title 24	% Improvement	N/A
	Install High Efficiency Lighting	% Lighting Energy Reduction	16
Alternative Energy	On-site Renewable Energy	kWh Generated	N/A
		% of Electricity Use Generated	N/A
Energy Efficient Appliances	ClothWasher	% Improvement	N/A
	DishWasher	% Improvement	N/A
	Fan	% Improvement	N/A
	Refrigerator	% Improvement	N/A

Water Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Water Conservation Strategy	Apply Water Conservation Strategy	% Reduction Indoor	N/A
		% Reduction Outdoor	N/A
Water Supply	Use Reclaimed Water	% Indoor Water Use	N/A
		% Outdoor Water Use	N/A
	Use Grey Water	% Indoor Water Use	N/A
		% Outdoor Water Use	N/A
Indoor Water Use	Install Low-flow Bathroom Faucet	% Reduction in flow	32
	Install Low-flow Kitchen Faucet	% Reduction in flow	18
	Install Low-flow Toilet	% Reduction in flow	20
	Install Low-flow Shower	% Reduction in flow	20
Outdoor Water Use	Turf Reducion	Turf Reduction Area (acres)	N/A
		% Reduction turf	N/A
	Use Water-Efficient Irrigation Systems	% Reduction	N/A
	Water Efficient Landscape	MAWA (gal/yr)	N/A
		ETWU (gal/yr)	N/A

Water Mitigation Measures			
Mitigation Category	**Mitigation Input**	**Type of input / unit**	**Inputs**
Solid Waste	Institute Recycling and Composting Services	% Reduction in waste disposed	50%

Tachi Palace EE

Kings County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	44.42	User Defined Unit	0.50	44,418.00	0
General Light Industry	100.00	1000sqft	2.00	100,000.00	0
Parking Lot	1,000.00	Space	5.00	400,000.00	0
Unenclosed Parking with Elevator	1,000.00	Space	3.00	400,000.00	0
Hotel	200.00	Room	1.50	140,000.00	0
User Defined Recreational	8.58	User Defined Unit	2.00	8,582.00	0
Convenience Market With Gas Pumps	6.00	1000sqft	0.14	6,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	37
Climate Zone	3			**Operational Year**	2026
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 - Input Table

Construction Phase - Project Description

Grading - Site Plan

Vehicle Trips - Trips rates adjusted based on TIA

Vehicle Emission Factors - EMFAC 2017

Vehicle Emission Factors - EMFAC 2017

Vehicle Emission Factors - EMFAC 2017

Water And Wastewater - CalEEMod defaults

Solid Waste - CalEEMod defaults

Construction Off-road Equipment Mitigation -

Mobile Commute Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Stationary Sources - Emergency Generators and Fire Pumps - Based on like projects.

Stationary Sources - Process Boilers - Based on

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	300.00	400.00
tblConstructionPhase	NumDays	20.00	0.00
tblConstructionPhase	NumDays	30.00	60.00
tblConstructionPhase	NumDays	20.00	40.00
tblConstructionPhase	NumDays	10.00	60.00
tblEnergyUse	LightingElect	0.00	1.51

tblEnergyUse	LightingElect	0.00	1.51
tblEnergyUse	NT24E	0.00	2.30
tblEnergyUse	NT24E	0.00	2.30
tblEnergyUse	NT24NG	0.00	7.16
tblEnergyUse	NT24NG	0.00	7.16
tblEnergyUse	T24E	0.00	4.13
tblEnergyUse	T24E	0.00	4.13
tblEnergyUse	T24NG	0.00	17.99
tblEnergyUse	T24NG	0.00	17.99
tblGrading	AcresOfGrading	150.00	10.00
tblLandUse	LandUseSquareFeet	0.00	44,418.00
tblLandUse	LandUseSquareFeet	290,400.00	140,000.00
tblLandUse	LandUseSquareFeet	0.00	8,582.00
tblLandUse	LotAcreage	0.00	0.50
tblLandUse	LotAcreage	2.30	2.00
tblLandUse	LotAcreage	9.00	5.00
tblLandUse	LotAcreage	9.00	3.00
tblLandUse	LotAcreage	6.67	1.50
tblLandUse	LotAcreage	0.00	2.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	0.00	109.50
tblSolidWaste	SolidWasteGenerationRate	0.00	109.50
tblStationaryBoilersUse	AnnualHeatInput	0.00	8,760.00
tblStationaryBoilersUse	BoilerRatingValue	0.00	0.50
tblStationaryBoilersUse	NumberOfEquipment	0.00	2.00
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	2,923.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	30.00

tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblVehicleEF	HHD	1.83	0.02
tblVehicleEF	HHD	5.8200e-003	0.05
tblVehicleEF	HHD	0.07	0.00
tblVehicleEF	HHD	1.86	6.28
tblVehicleEF	HHD	0.51	0.40
tblVehicleEF	HHD	0.56	5.3000e-003
tblVehicleEF	HHD	5,624.63	1,039.23
tblVehicleEF	HHD	1,468.80	1,409.20
tblVehicleEF	HHD	1.80	0.04
tblVehicleEF	HHD	15.49	5.34
tblVehicleEF	HHD	1.60	2.66
tblVehicleEF	HHD	20.65	2.36
tblVehicleEF	HHD	2.4210e-003	2.6000e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.7150e-003	0.02
tblVehicleEF	HHD	1.5000e-005	0.00
tblVehicleEF	HHD	2.3170e-003	2.5000e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.9740e-003	8.9000e-003
tblVehicleEF	HHD	5.4680e-003	0.02
tblVehicleEF	HHD	1.3000e-005	0.00
tblVehicleEF	HHD	2.6000e-005	0.00
tblVehicleEF	HHD	8.9100e-004	1.0000e-004
tblVehicleEF	HHD	0.50	0.42
tblVehicleEF	HHD	1.4000e-005	0.00

tblVehicleEF	HHD	0.08	0.03
tblVehicleEF	HHD	6.5000e-005	0.00
tblVehicleEF	HHD	0.01	0.00
tblVehicleEF	HHD	0.05	9.7000e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	2.7000e-005	0.00
tblVehicleEF	HHD	2.6000e-005	0.00
tblVehicleEF	HHD	8.9100e-004	1.0000e-004
tblVehicleEF	HHD	0.57	0.49
tblVehicleEF	HHD	1.4000e-005	0.00
tblVehicleEF	HHD	0.09	0.07
tblVehicleEF	HHD	6.5000e-005	0.00
tblVehicleEF	HHD	0.01	0.00
tblVehicleEF	HHD	1.72	0.02
tblVehicleEF	HHD	5.8260e-003	0.05
tblVehicleEF	HHD	0.07	0.00
tblVehicleEF	HHD	1.35	6.28
tblVehicleEF	HHD	0.52	0.40
tblVehicleEF	HHD	0.52	5.3000e-003
tblVehicleEF	HHD	5,958.79	1,039.23
tblVehicleEF	HHD	1,468.80	1,409.20
tblVehicleEF	HHD	1.80	0.04
tblVehicleEF	HHD	15.98	5.34
tblVehicleEF	HHD	1.52	2.66
tblVehicleEF	HHD	20.65	2.36
tblVehicleEF	HHD	2.0420e-003	2.6000e-003
tblVehicleEF	HHD	0.06	0.06

tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.7150e-003	0.02
tblVehicleEF	HHD	1.5000e-005	0.00
tblVehicleEF	HHD	1.9530e-003	2.5000e-003
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tblVehicleEF	HHD	8.9740e-003	8.9000e-003
tblVehicleEF	HHD	5.4680e-003	0.02
tblVehicleEF	HHD	1.3000e-005	0.00
tblVehicleEF	HHD	6.2000e-005	0.00
tblVehicleEF	HHD	1.0030e-003	1.0000e-004
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tblVehicleEF	HHD	2.8000e-005	0.00
tblVehicleEF	HHD	0.08	0.03
tblVehicleEF	HHD	6.5000e-005	0.00
tblVehicleEF	HHD	0.01	0.00
tblVehicleEF	HHD	0.06	9.7000e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	2.7000e-005	0.00
tblVehicleEF	HHD	6.2000e-005	0.00
tblVehicleEF	HHD	1.0030e-003	1.0000e-004
tblVehicleEF	HHD	0.54	0.49
tblVehicleEF	HHD	2.8000e-005	0.00
tblVehicleEF	HHD	0.09	0.07
tblVehicleEF	HHD	6.5000e-005	0.00
tblVehicleEF	HHD	0.01	0.00
tblVehicleEF	HHD	1.97	0.02
tblVehicleEF	HHD	5.8130e-003	0.05

tblVehicleEF	HHD	0.08	0.00
tblVehicleEF	HHD	2.56	6.28
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tblVehicleEF	HHD	1,468.80	1,409.20
tblVehicleEF	HHD	1.80	0.04
tblVehicleEF	HHD	14.80	5.34
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tblVehicleEF	HHD	20.65	2.36
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tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.7150e-003	0.02
tblVehicleEF	HHD	1.5000e-005	0.00
tblVehicleEF	HHD	2.8180e-003	2.5000e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.9740e-003	8.9000e-003
tblVehicleEF	HHD	5.4680e-003	0.02
tblVehicleEF	HHD	1.3000e-005	0.00
tblVehicleEF	HHD	9.0000e-006	0.00
tblVehicleEF	HHD	8.8400e-004	1.0000e-004
tblVehicleEF	HHD	0.54	0.42
tblVehicleEF	HHD	5.0000e-006	0.00
tblVehicleEF	HHD	0.08	0.03
tblVehicleEF	HHD	7.2000e-005	0.00
tblVehicleEF	HHD	0.01	0.00

tblVehicleEF	HHD	0.05	9.7000e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	2.8000e-005	0.00
tblVehicleEF	HHD	9.0000e-006	0.00
tblVehicleEF	HHD	8.8400e-004	1.0000e-004
tblVehicleEF	HHD	0.62	0.49
tblVehicleEF	HHD	5.0000e-006	0.00
tblVehicleEF	HHD	0.09	0.07
tblVehicleEF	HHD	7.2000e-005	0.00
tblVehicleEF	HHD	0.01	0.00
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tblVehicleEF	LDA	208.72	239.59
tblVehicleEF	LDA	48.62	50.81
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.05	0.17
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	1.5200e-003	1.3000e-003
tblVehicleEF	LDA	2.2030e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.3990e-003	1.2000e-003
tblVehicleEF	LDA	2.0250e-003	1.6000e-003
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.07	0.09
tblVehicleEF	LDA	0.02	0.04

tblVehicleEF	LDA	7.2570e-003	6.6000e-003
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tblVehicleEF	LDA	0.04	0.21
tblVehicleEF	LDA	2.0890e-003	2.4000e-003
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.07	0.09
tblVehicleEF	LDA	0.02	0.04
tblVehicleEF	LDA	0.01	9.6000e-003
tblVehicleEF	LDA	0.03	0.03
tblVehicleEF	LDA	0.05	0.23
tblVehicleEF	LDA	3.3350e-003	1.8000e-003
tblVehicleEF	LDA	2.6960e-003	0.05
tblVehicleEF	LDA	0.54	0.52
tblVehicleEF	LDA	0.69	2.15
tblVehicleEF	LDA	229.59	239.59
tblVehicleEF	LDA	48.62	50.81
tblVehicleEF	LDA	0.03	0.03
tblVehicleEF	LDA	0.05	0.17
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	1.5200e-003	1.3000e-003
tblVehicleEF	LDA	2.2030e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.3990e-003	1.2000e-003
tblVehicleEF	LDA	2.0250e-003	1.6000e-003
tblVehicleEF	LDA	0.07	0.04
tblVehicleEF	LDA	0.08	0.09
tblVehicleEF	LDA	0.05	0.04

tblVehicleEF	LDA	8.3490e-003	6.6000e-003
tblVehicleEF	LDA	0.03	0.03
tblVehicleEF	LDA	0.04	0.21
tblVehicleEF	LDA	2.3000e-003	2.4000e-003
tblVehicleEF	LDA	4.9700e-004	5.0000e-004
tblVehicleEF	LDA	0.07	0.04
tblVehicleEF	LDA	0.08	0.09
tblVehicleEF	LDA	0.05	0.04
tblVehicleEF	LDA	0.01	9.6000e-003
tblVehicleEF	LDA	0.03	0.03
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	2.6970e-003	1.8000e-003
tblVehicleEF	LDA	3.9110e-003	0.05
tblVehicleEF	LDA	0.40	0.52
tblVehicleEF	LDA	1.03	2.15
tblVehicleEF	LDA	200.20	239.59
tblVehicleEF	LDA	48.62	50.81
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.17
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	1.5200e-003	1.3000e-003
tblVehicleEF	LDA	2.2030e-003	1.7000e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	1.3990e-003	1.2000e-003
tblVehicleEF	LDA	2.0250e-003	1.6000e-003
tblVehicleEF	LDA	9.2590e-003	0.04
tblVehicleEF	LDA	0.07	0.09

tblVehicleEF	LDA	7.5160e-003	0.04
tblVehicleEF	LDA	6.7710e-003	6.6000e-003
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.05	0.21
tblVehicleEF	LDA	2.0040e-003	2.4000e-003
tblVehicleEF	LDA	5.0300e-004	5.0000e-004
tblVehicleEF	LDA	9.2590e-003	0.04
tblVehicleEF	LDA	0.07	0.09
tblVehicleEF	LDA	7.5160e-003	0.04
tblVehicleEF	LDA	9.8460e-003	9.6000e-003
tblVehicleEF	LDA	0.04	0.03
tblVehicleEF	LDA	0.06	0.23
tblVehicleEF	LDT1	0.01	3.8000e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.13	0.87
tblVehicleEF	LDT1	2.50	2.34
tblVehicleEF	LDT1	269.55	287.73
tblVehicleEF	LDT1	62.44	61.75
tblVehicleEF	LDT1	0.12	0.07
tblVehicleEF	LDT1	0.15	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	2.2250e-003	1.7000e-003
tblVehicleEF	LDT1	3.0340e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0480e-003	1.5000e-003
tblVehicleEF	LDT1	2.7900e-003	2.0000e-003
tblVehicleEF	LDT1	0.14	0.09

tblVehicleEF	LDT1	0.24	0.18
tblVehicleEF	LDT1	0.09	0.08
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.17	0.08
tblVehicleEF	LDT1	0.17	0.32
tblVehicleEF	LDT1	2.7090e-003	2.8000e-003
tblVehicleEF	LDT1	6.6800e-004	6.0000e-004
tblVehicleEF	LDT1	0.14	0.09
tblVehicleEF	LDT1	0.24	0.18
tblVehicleEF	LDT1	0.09	0.08
tblVehicleEF	LDT1	0.04	0.02
tblVehicleEF	LDT1	0.17	0.08
tblVehicleEF	LDT1	0.18	0.35
tblVehicleEF	LDT1	0.01	3.8000e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.38	0.87
tblVehicleEF	LDT1	2.06	2.34
tblVehicleEF	LDT1	295.46	287.73
tblVehicleEF	LDT1	62.44	61.75
tblVehicleEF	LDT1	0.12	0.07
tblVehicleEF	LDT1	0.14	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	2.2250e-003	1.7000e-003
tblVehicleEF	LDT1	3.0340e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0480e-003	1.5000e-003
tblVehicleEF	LDT1	2.7900e-003	2.0000e-003

tblVehicleEF	LDT1	0.34	0.09
tblVehicleEF	LDT1	0.31	0.18
tblVehicleEF	LDT1	0.20	0.08
tblVehicleEF	LDT1	0.03	0.02
tblVehicleEF	LDT1	0.17	0.08
tblVehicleEF	LDT1	0.14	0.32
tblVehicleEF	LDT1	2.9720e-003	2.8000e-003
tblVehicleEF	LDT1	6.6000e-004	6.0000e-004
tblVehicleEF	LDT1	0.34	0.09
tblVehicleEF	LDT1	0.31	0.18
tblVehicleEF	LDT1	0.20	0.08
tblVehicleEF	LDT1	0.04	0.02
tblVehicleEF	LDT1	0.17	0.08
tblVehicleEF	LDT1	0.15	0.35
tblVehicleEF	LDT1	9.9150e-003	3.8000e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	1.05	0.87
tblVehicleEF	LDT1	3.11	2.34
tblVehicleEF	LDT1	258.98	287.73
tblVehicleEF	LDT1	62.44	61.75
tblVehicleEF	LDT1	0.14	0.07
tblVehicleEF	LDT1	0.17	0.24
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	2.2250e-003	1.7000e-003
tblVehicleEF	LDT1	3.0340e-003	2.2000e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0480e-003	1.5000e-003

tblVehicleEF	LDT1	2.7900e-003	2.0000e-003
tblVehicleEF	LDT1	0.04	0.09
tblVehicleEF	LDT1	0.24	0.18
tblVehicleEF	LDT1	0.03	0.08
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.21	0.08
tblVehicleEF	LDT1	0.20	0.32
tblVehicleEF	LDT1	2.6020e-003	2.8000e-003
tblVehicleEF	LDT1	6.7900e-004	6.0000e-004
tblVehicleEF	LDT1	0.04	0.09
tblVehicleEF	LDT1	0.24	0.18
tblVehicleEF	LDT1	0.03	0.08
tblVehicleEF	LDT1	0.04	0.02
tblVehicleEF	LDT1	0.21	0.08
tblVehicleEF	LDT1	0.22	0.35
tblVehicleEF	LDT2	5.3780e-003	2.9000e-003
tblVehicleEF	LDT2	5.8560e-003	0.06
tblVehicleEF	LDT2	0.68	0.70
tblVehicleEF	LDT2	1.31	2.74
tblVehicleEF	LDT2	304.59	307.00
tblVehicleEF	LDT2	70.08	66.18
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	0.10	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.6950e-003	1.3000e-003
tblVehicleEF	LDT2	2.4320e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02

tblVehicleEF	LDT2	1.5590e-003	1.2000e-003
tblVehicleEF	LDT2	2.2370e-003	1.6000e-003
tblVehicleEF	LDT2	0.06	0.06
tblVehicleEF	LDT2	0.11	0.12
tblVehicleEF	LDT2	0.05	0.06
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.08	0.05
tblVehicleEF	LDT2	0.08	0.29
tblVehicleEF	LDT2	3.0510e-003	3.0000e-003
tblVehicleEF	LDT2	7.2300e-004	7.0000e-004
tblVehicleEF	LDT2	0.06	0.06
tblVehicleEF	LDT2	0.11	0.12
tblVehicleEF	LDT2	0.05	0.06
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.08	0.05
tblVehicleEF	LDT2	0.09	0.32
tblVehicleEF	LDT2	6.1740e-003	2.9000e-003
tblVehicleEF	LDT2	4.8320e-003	0.06
tblVehicleEF	LDT2	0.85	0.70
tblVehicleEF	LDT2	1.09	2.74
tblVehicleEF	LDT2	334.25	307.00
tblVehicleEF	LDT2	70.08	66.18
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	0.10	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.6950e-003	1.3000e-003
tblVehicleEF	LDT2	2.4320e-003	1.7000e-003

tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.5590e-003	1.2000e-003
tblVehicleEF	LDT2	2.2370e-003	1.6000e-003
tblVehicleEF	LDT2	0.14	0.06
tblVehicleEF	LDT2	0.13	0.12
tblVehicleEF	LDT2	0.10	0.06
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	0.07	0.05
tblVehicleEF	LDT2	0.07	0.29
tblVehicleEF	LDT2	3.3500e-003	3.0000e-003
tblVehicleEF	LDT2	7.1900e-004	7.0000e-004
tblVehicleEF	LDT2	0.14	0.06
tblVehicleEF	LDT2	0.13	0.12
tblVehicleEF	LDT2	0.10	0.06
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.07	0.05
tblVehicleEF	LDT2	0.07	0.32
tblVehicleEF	LDT2	5.0280e-003	2.9000e-003
tblVehicleEF	LDT2	6.9990e-003	0.06
tblVehicleEF	LDT2	0.63	0.70
tblVehicleEF	LDT2	1.61	2.74
tblVehicleEF	LDT2	292.49	307.00
tblVehicleEF	LDT2	70.08	66.18
tblVehicleEF	LDT2	0.08	0.06
tblVehicleEF	LDT2	0.11	0.26
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	1.6950e-003	1.3000e-003

tblVehicleEF	LDT2	2.4320e-003	1.7000e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	1.5590e-003	1.2000e-003
tblVehicleEF	LDT2	2.2370e-003	1.6000e-003
tblVehicleEF	LDT2	0.02	0.06
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.02	0.06
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.09	0.05
tblVehicleEF	LDT2	0.09	0.29
tblVehicleEF	LDT2	2.9300e-003	3.0000e-003
tblVehicleEF	LDT2	7.2800e-004	7.0000e-004
tblVehicleEF	LDT2	0.02	0.06
tblVehicleEF	LDT2	0.10	0.12
tblVehicleEF	LDT2	0.02	0.06
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.09	0.05
tblVehicleEF	LDT2	0.10	0.32
tblVehicleEF	LHD1	4.0460e-003	4.8000e-003
tblVehicleEF	LHD1	0.01	8.4000e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	0.13	0.18
tblVehicleEF	LHD1	0.96	0.77
tblVehicleEF	LHD1	1.71	0.99
tblVehicleEF	LHD1	9.49	9.11
tblVehicleEF	LHD1	665.67	776.98
tblVehicleEF	LHD1	24.96	10.85

tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	1.74	0.94
tblVehicleEF	LHD1	0.77	0.30
tblVehicleEF	LHD1	1.1100e-003	9.0000e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9000e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	6.1700e-004	2.0000e-004
tblVehicleEF	LHD1	1.0620e-003	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.6180e-003	2.5000e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	5.6700e-004	2.0000e-004
tblVehicleEF	LHD1	2.8650e-003	1.8000e-003
tblVehicleEF	LHD1	0.08	0.07
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	1.3010e-003	1.0000e-003
tblVehicleEF	LHD1	0.14	0.10
tblVehicleEF	LHD1	0.28	0.20
tblVehicleEF	LHD1	0.17	0.07
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	6.5000e-003	7.6000e-003
tblVehicleEF	LHD1	2.8200e-004	1.0000e-004
tblVehicleEF	LHD1	2.8650e-003	1.8000e-003
tblVehicleEF	LHD1	0.08	0.07
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.3010e-003	1.0000e-003

tblVehicleEF	LHD1	0.16	0.12
tblVehicleEF	LHD1	0.28	0.20
tblVehicleEF	LHD1	0.19	0.08
tblVehicleEF	LHD1	4.0460e-003	4.8000e-003
tblVehicleEF	LHD1	0.01	8.4000e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	0.13	0.18
tblVehicleEF	LHD1	0.97	0.77
tblVehicleEF	LHD1	1.59	0.99
tblVehicleEF	LHD1	9.49	9.11
tblVehicleEF	LHD1	665.67	776.98
tblVehicleEF	LHD1	24.96	10.85
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	1.65	0.94
tblVehicleEF	LHD1	0.73	0.30
tblVehicleEF	LHD1	1.1100e-003	9.0000e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9000e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	6.1700e-004	2.0000e-004
tblVehicleEF	LHD1	1.0620e-003	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.6180e-003	2.5000e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	5.6700e-004	2.0000e-004
tblVehicleEF	LHD1	6.7100e-003	1.8000e-003
tblVehicleEF	LHD1	0.10	0.07

tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	2.6280e-003	1.0000e-003
tblVehicleEF	LHD1	0.14	0.10
tblVehicleEF	LHD1	0.28	0.20
tblVehicleEF	LHD1	0.16	0.07
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	6.5000e-003	7.6000e-003
tblVehicleEF	LHD1	2.8000e-004	1.0000e-004
tblVehicleEF	LHD1	6.7100e-003	1.8000e-003
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	2.6280e-003	1.0000e-003
tblVehicleEF	LHD1	0.16	0.12
tblVehicleEF	LHD1	0.28	0.20
tblVehicleEF	LHD1	0.18	0.08
tblVehicleEF	LHD1	4.0460e-003	4.8000e-003
tblVehicleEF	LHD1	0.01	8.4000e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	0.13	0.18
tblVehicleEF	LHD1	0.95	0.77
tblVehicleEF	LHD1	1.88	0.99
tblVehicleEF	LHD1	9.49	9.11
tblVehicleEF	LHD1	665.67	776.98
tblVehicleEF	LHD1	24.96	10.85
tblVehicleEF	LHD1	0.10	0.07
tblVehicleEF	LHD1	1.78	0.94
tblVehicleEF	LHD1	0.83	0.30

tblVehicleEF	LHD1	1.1100e-003	9.0000e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	0.01	9.9000e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	6.1700e-004	2.0000e-004
tblVehicleEF	LHD1	1.0620e-003	9.0000e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.6180e-003	2.5000e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	5.6700e-004	2.0000e-004
tblVehicleEF	LHD1	9.0300e-004	1.8000e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	5.0500e-004	1.0000e-003
tblVehicleEF	LHD1	0.14	0.10
tblVehicleEF	LHD1	0.31	0.20
tblVehicleEF	LHD1	0.19	0.07
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	6.5000e-003	7.6000e-003
tblVehicleEF	LHD1	2.8500e-004	1.0000e-004
tblVehicleEF	LHD1	9.0300e-004	1.8000e-003
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	5.0500e-004	1.0000e-003
tblVehicleEF	LHD1	0.16	0.12
tblVehicleEF	LHD1	0.31	0.20
tblVehicleEF	LHD1	0.20	0.08

tblVehicleEF	LHD2	2.8600e-003	2.9000e-003
tblVehicleEF	LHD2	6.6880e-003	6.9000e-003
tblVehicleEF	LHD2	4.9760e-003	7.3000e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.56	0.64
tblVehicleEF	LHD2	0.94	0.55
tblVehicleEF	LHD2	14.23	14.31
tblVehicleEF	LHD2	693.47	754.66
tblVehicleEF	LHD2	21.71	7.04
tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.75	0.98
tblVehicleEF	LHD2	0.36	0.17
tblVehicleEF	LHD2	1.2330e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.4000e-004	1.0000e-004
tblVehicleEF	LHD2	1.1800e-003	1.4000e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.7120e-003	2.7000e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.1200e-004	1.0000e-004
tblVehicleEF	LHD2	9.9200e-004	8.0000e-004
tblVehicleEF	LHD2	0.03	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	4.8700e-004	5.0000e-004
tblVehicleEF	LHD2	0.11	0.12

tblVehicleEF	LHD2	0.06	0.08
tblVehicleEF	LHD2	0.07	0.04
tblVehicleEF	LHD2	1.3800e-004	1.0000e-004
tblVehicleEF	LHD2	6.7350e-003	7.3000e-003
tblVehicleEF	LHD2	2.3400e-004	1.0000e-004
tblVehicleEF	LHD2	9.9200e-004	8.0000e-004
tblVehicleEF	LHD2	0.03	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	4.8700e-004	5.0000e-004
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.06	0.08
tblVehicleEF	LHD2	0.07	0.04
tblVehicleEF	LHD2	2.8600e-003	2.9000e-003
tblVehicleEF	LHD2	6.7480e-003	6.9000e-003
tblVehicleEF	LHD2	4.7410e-003	7.3000e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.56	0.64
tblVehicleEF	LHD2	0.87	0.55
tblVehicleEF	LHD2	14.23	14.31
tblVehicleEF	LHD2	693.47	754.66
tblVehicleEF	LHD2	21.71	7.04
tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.72	0.98
tblVehicleEF	LHD2	0.35	0.17
tblVehicleEF	LHD2	1.2330e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01

tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.4000e-004	1.0000e-004
tblVehicleEF	LHD2	1.1800e-003	1.4000e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.7120e-003	2.7000e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.1200e-004	1.0000e-004
tblVehicleEF	LHD2	2.3110e-003	8.0000e-004
tblVehicleEF	LHD2	0.03	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	9.7700e-004	5.0000e-004
tblVehicleEF	LHD2	0.11	0.12
tblVehicleEF	LHD2	0.06	0.08
tblVehicleEF	LHD2	0.06	0.04
tblVehicleEF	LHD2	1.3800e-004	1.0000e-004
tblVehicleEF	LHD2	6.7360e-003	7.3000e-003
tblVehicleEF	LHD2	2.3300e-004	1.0000e-004
tblVehicleEF	LHD2	2.3110e-003	8.0000e-004
tblVehicleEF	LHD2	0.03	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	9.7700e-004	5.0000e-004
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.06	0.08
tblVehicleEF	LHD2	0.07	0.04
tblVehicleEF	LHD2	2.8600e-003	2.9000e-003
tblVehicleEF	LHD2	6.6190e-003	6.9000e-003
tblVehicleEF	LHD2	5.2590e-003	7.3000e-003

tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.56	0.64
tblVehicleEF	LHD2	1.02	0.55
tblVehicleEF	LHD2	14.23	14.31
tblVehicleEF	LHD2	693.47	754.66
tblVehicleEF	LHD2	21.71	7.04
tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.77	0.98
tblVehicleEF	LHD2	0.39	0.17
tblVehicleEF	LHD2	1.2330e-003	1.5000e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.4000e-004	1.0000e-004
tblVehicleEF	LHD2	1.1800e-003	1.4000e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.7120e-003	2.7000e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.1200e-004	1.0000e-004
tblVehicleEF	LHD2	3.1900e-004	8.0000e-004
tblVehicleEF	LHD2	0.03	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	1.9000e-004	5.0000e-004
tblVehicleEF	LHD2	0.11	0.12
tblVehicleEF	LHD2	0.06	0.08
tblVehicleEF	LHD2	0.07	0.04
tblVehicleEF	LHD2	1.3800e-004	1.0000e-004

tblVehicleEF	LHD2	6.7350e-003	7.3000e-003
tblVehicleEF	LHD2	2.3500e-004	1.0000e-004
tblVehicleEF	LHD2	3.1900e-004	8.0000e-004
tblVehicleEF	LHD2	0.03	0.03
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.9000e-004	5.0000e-004
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.06	0.08
tblVehicleEF	LHD2	0.08	0.04
tblVehicleEF	MCY	0.44	0.34
tblVehicleEF	MCY	0.16	0.26
tblVehicleEF	MCY	18.83	20.00
tblVehicleEF	MCY	10.11	9.07
tblVehicleEF	MCY	167.55	213.40
tblVehicleEF	MCY	45.55	61.71
tblVehicleEF	MCY	1.15	1.16
tblVehicleEF	MCY	0.31	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	1.9380e-003	2.0000e-003
tblVehicleEF	MCY	3.1780e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	1.8110e-003	1.9000e-003
tblVehicleEF	MCY	2.9870e-003	2.8000e-003
tblVehicleEF	MCY	1.61	0.89
tblVehicleEF	MCY	0.92	0.75
tblVehicleEF	MCY	0.85	0.56
tblVehicleEF	MCY	2.20	2.29

tblVehicleEF	MCY	0.49	0.56
tblVehicleEF	MCY	2.15	1.98
tblVehicleEF	MCY	2.0480e-003	2.1000e-003
tblVehicleEF	MCY	6.8400e-004	6.0000e-004
tblVehicleEF	MCY	1.61	0.89
tblVehicleEF	MCY	0.92	0.75
tblVehicleEF	MCY	0.85	0.56
tblVehicleEF	MCY	2.72	2.82
tblVehicleEF	MCY	0.49	0.56
tblVehicleEF	MCY	2.34	2.15
tblVehicleEF	MCY	0.43	0.34
tblVehicleEF	MCY	0.13	0.26
tblVehicleEF	MCY	19.17	20.00
tblVehicleEF	MCY	9.11	9.07
tblVehicleEF	MCY	167.55	213.40
tblVehicleEF	MCY	45.55	61.71
tblVehicleEF	MCY	1.00	1.16
tblVehicleEF	MCY	0.29	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	1.9380e-003	2.0000e-003
tblVehicleEF	MCY	3.1780e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	1.8110e-003	1.9000e-003
tblVehicleEF	MCY	2.9870e-003	2.8000e-003
tblVehicleEF	MCY	4.03	0.89
tblVehicleEF	MCY	1.44	0.75
tblVehicleEF	MCY	2.16	0.56

tblVehicleEF	MCY	2.15	2.29
tblVehicleEF	MCY	0.48	0.56
tblVehicleEF	MCY	1.84	1.98
tblVehicleEF	MCY	2.0520e-003	2.1000e-003
tblVehicleEF	MCY	6.5800e-004	6.0000e-004
tblVehicleEF	MCY	4.03	0.89
tblVehicleEF	MCY	1.44	0.75
tblVehicleEF	MCY	2.16	0.56
tblVehicleEF	MCY	2.67	2.82
tblVehicleEF	MCY	0.48	0.56
tblVehicleEF	MCY	2.00	2.15
tblVehicleEF	MCY	0.46	0.34
tblVehicleEF	MCY	0.19	0.26
tblVehicleEF	MCY	20.27	20.00
tblVehicleEF	MCY	11.95	9.07
tblVehicleEF	MCY	167.55	213.40
tblVehicleEF	MCY	45.55	61.71
tblVehicleEF	MCY	1.26	1.16
tblVehicleEF	MCY	0.34	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	1.9380e-003	2.0000e-003
tblVehicleEF	MCY	3.1780e-003	3.0000e-003
tblVehicleEF	MCY	5.0400e-003	5.0000e-003
tblVehicleEF	MCY	1.8110e-003	1.9000e-003
tblVehicleEF	MCY	2.9870e-003	2.8000e-003
tblVehicleEF	MCY	0.40	0.89
tblVehicleEF	MCY	0.90	0.75

tblVehicleEF	MCY	0.19	0.56
tblVehicleEF	MCY	2.30	2.29
tblVehicleEF	MCY	0.58	0.56
tblVehicleEF	MCY	2.60	1.98
tblVehicleEF	MCY	2.0740e-003	2.1000e-003
tblVehicleEF	MCY	7.2800e-004	6.0000e-004
tblVehicleEF	MCY	0.40	0.89
tblVehicleEF	MCY	0.90	0.75
tblVehicleEF	MCY	0.19	0.56
tblVehicleEF	MCY	2.85	2.82
tblVehicleEF	MCY	0.58	0.56
tblVehicleEF	MCY	2.83	2.15
tblVehicleEF	MDV	8.2740e-003	3.8000e-003
tblVehicleEF	MDV	0.01	0.08
tblVehicleEF	MDV	0.93	0.82
tblVehicleEF	MDV	2.52	3.10
tblVehicleEF	MDV	423.22	379.50
tblVehicleEF	MDV	99.73	81.06
tblVehicleEF	MDV	0.12	0.08
tblVehicleEF	MDV	0.25	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	1.6000e-003	1.5000e-003
tblVehicleEF	MDV	2.2400e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	1.4740e-003	1.3000e-003
tblVehicleEF	MDV	2.0600e-003	1.7000e-003
tblVehicleEF	MDV	0.11	0.07

tblVehicleEF	MDV	0.20	0.15
tblVehicleEF	MDV	0.09	0.08
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	0.13	0.06
tblVehicleEF	MDV	0.18	0.38
tblVehicleEF	MDV	4.2360e-003	3.8000e-003
tblVehicleEF	MDV	1.0410e-003	8.0000e-004
tblVehicleEF	MDV	0.11	0.07
tblVehicleEF	MDV	0.20	0.15
tblVehicleEF	MDV	0.09	0.08
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.13	0.06
tblVehicleEF	MDV	0.20	0.42
tblVehicleEF	MDV	9.5150e-003	3.8000e-003
tblVehicleEF	MDV	0.01	0.08
tblVehicleEF	MDV	1.16	0.82
tblVehicleEF	MDV	2.09	3.10
tblVehicleEF	MDV	463.40	379.50
tblVehicleEF	MDV	99.73	81.06
tblVehicleEF	MDV	0.11	0.08
tblVehicleEF	MDV	0.24	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	1.6000e-003	1.5000e-003
tblVehicleEF	MDV	2.2400e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	1.4740e-003	1.3000e-003
tblVehicleEF	MDV	2.0600e-003	1.7000e-003

tblVehicleEF	MDV	0.25	0.07
tblVehicleEF	MDV	0.23	0.15
tblVehicleEF	MDV	0.18	0.08
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	0.13	0.06
tblVehicleEF	MDV	0.15	0.38
tblVehicleEF	MDV	4.6410e-003	3.8000e-003
tblVehicleEF	MDV	1.0330e-003	8.0000e-004
tblVehicleEF	MDV	0.25	0.07
tblVehicleEF	MDV	0.23	0.15
tblVehicleEF	MDV	0.18	0.08
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.13	0.06
tblVehicleEF	MDV	0.17	0.42
tblVehicleEF	MDV	7.7380e-003	3.8000e-003
tblVehicleEF	MDV	0.02	0.08
tblVehicleEF	MDV	0.86	0.82
tblVehicleEF	MDV	3.11	3.10
tblVehicleEF	MDV	406.82	379.50
tblVehicleEF	MDV	99.73	81.06
tblVehicleEF	MDV	0.13	0.08
tblVehicleEF	MDV	0.28	0.32
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	1.6000e-003	1.5000e-003
tblVehicleEF	MDV	2.2400e-003	1.8000e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	1.4740e-003	1.3000e-003

tblVehicleEF	MDV	2.0600e-003	1.7000e-003
tblVehicleEF	MDV	0.03	0.07
tblVehicleEF	MDV	0.19	0.15
tblVehicleEF	MDV	0.03	0.08
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	0.15	0.06
tblVehicleEF	MDV	0.22	0.38
tblVehicleEF	MDV	4.0710e-003	3.8000e-003
tblVehicleEF	MDV	1.0520e-003	8.0000e-004
tblVehicleEF	MDV	0.03	0.07
tblVehicleEF	MDV	0.19	0.15
tblVehicleEF	MDV	0.03	0.08
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.15	0.06
tblVehicleEF	MDV	0.24	0.42
tblVehicleEF	MH	0.02	9.3000e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.56	0.85
tblVehicleEF	MH	4.89	1.96
tblVehicleEF	MH	1,207.14	1,512.95
tblVehicleEF	MH	56.14	17.73
tblVehicleEF	MH	1.42	1.52
tblVehicleEF	MH	0.76	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.8600e-004	2.0000e-004

tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2460e-003	3.3000e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.0700e-004	2.0000e-004
tblVehicleEF	MH	1.19	0.58
tblVehicleEF	MH	0.07	0.05
tblVehicleEF	MH	0.33	0.23
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	0.29	0.09
tblVehicleEF	MH	0.01	0.01
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tblVehicleEF	MH	1.19	0.58
tblVehicleEF	MH	0.07	0.05
tblVehicleEF	MH	0.33	0.23
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	0.31	0.10
tblVehicleEF	MH	0.02	9.3000e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.61	0.85
tblVehicleEF	MH	4.43	1.96
tblVehicleEF	MH	1,207.14	1,512.95
tblVehicleEF	MH	56.14	17.73
tblVehicleEF	MH	1.33	1.52
tblVehicleEF	MH	0.72	0.24
tblVehicleEF	MH	0.13	0.13

tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.8600e-004	2.0000e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2460e-003	3.3000e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.0700e-004	2.0000e-004
tblVehicleEF	MH	2.82	0.58
tblVehicleEF	MH	0.08	0.05
tblVehicleEF	MH	0.67	0.23
tblVehicleEF	MH	0.09	0.07
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	0.27	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.3900e-004	2.0000e-004
tblVehicleEF	MH	2.82	0.58
tblVehicleEF	MH	0.08	0.05
tblVehicleEF	MH	0.67	0.23
tblVehicleEF	MH	0.12	0.08
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	0.29	0.10
tblVehicleEF	MH	0.02	9.3000e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.50	0.85
tblVehicleEF	MH	5.52	1.96
tblVehicleEF	MH	1,207.14	1,512.95
tblVehicleEF	MH	56.14	17.73

tblVehicleEF	MH	1.47	1.52
tblVehicleEF	MH	0.82	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.8600e-004	2.0000e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.2460e-003	3.3000e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.0700e-004	2.0000e-004
tblVehicleEF	MH	0.36	0.58
tblVehicleEF	MH	0.08	0.05
tblVehicleEF	MH	0.15	0.23
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.03	0.01
tblVehicleEF	MH	0.31	0.09
tblVehicleEF	MH	0.01	0.01
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tblVehicleEF	MH	0.36	0.58
tblVehicleEF	MH	0.08	0.05
tblVehicleEF	MH	0.15	0.23
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.03	0.01
tblVehicleEF	MH	0.34	0.10
tblVehicleEF	MHD	0.02	4.0000e-003
tblVehicleEF	MHD	3.7500e-003	2.1000e-003
tblVehicleEF	MHD	0.04	0.01

tblVehicleEF	MHD	0.32	0.43
tblVehicleEF	MHD	0.32	0.27
tblVehicleEF	MHD	4.09	1.19
tblVehicleEF	MHD	154.05	84.01
tblVehicleEF	MHD	1,195.31	1,109.33
tblVehicleEF	MHD	51.17	10.07
tblVehicleEF	MHD	0.43	0.52
tblVehicleEF	MHD	1.21	1.47
tblVehicleEF	MHD	11.75	1.66
tblVehicleEF	MHD	1.1800e-004	5.0000e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	3.3220e-003	7.2000e-003
tblVehicleEF	MHD	7.2900e-004	1.0000e-004
tblVehicleEF	MHD	1.1300e-004	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.1710e-003	6.9000e-003
tblVehicleEF	MHD	6.7100e-004	1.0000e-004
tblVehicleEF	MHD	1.0350e-003	4.0000e-004
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	4.8300e-004	2.0000e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.25	0.05
tblVehicleEF	MHD	1.4800e-003	8.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.8300e-004	1.0000e-004

tblVehicleEF	MHD	1.0350e-003	4.0000e-004
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	4.8300e-004	2.0000e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.27	0.06
tblVehicleEF	MHD	0.01	4.0000e-003
tblVehicleEF	MHD	3.8050e-003	2.1000e-003
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.22	0.43
tblVehicleEF	MHD	0.32	0.27
tblVehicleEF	MHD	3.80	1.19
tblVehicleEF	MHD	163.32	84.01
tblVehicleEF	MHD	1,195.31	1,109.33
tblVehicleEF	MHD	51.17	10.07
tblVehicleEF	MHD	0.44	0.52
tblVehicleEF	MHD	1.15	1.47
tblVehicleEF	MHD	11.72	1.66
tblVehicleEF	MHD	9.9000e-005	5.0000e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	3.3220e-003	7.2000e-003
tblVehicleEF	MHD	7.2900e-004	1.0000e-004
tblVehicleEF	MHD	9.5000e-005	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.1710e-003	6.9000e-003
tblVehicleEF	MHD	6.7100e-004	1.0000e-004

tblVehicleEF	MHD	2.4530e-003	4.0000e-004
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	1.0070e-003	2.0000e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.23	0.05
tblVehicleEF	MHD	1.5680e-003	8.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.7800e-004	1.0000e-004
tblVehicleEF	MHD	2.4530e-003	4.0000e-004
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	1.0070e-003	2.0000e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.26	0.06
tblVehicleEF	MHD	0.02	4.0000e-003
tblVehicleEF	MHD	3.6850e-003	2.1000e-003
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.42	0.43
tblVehicleEF	MHD	0.31	0.27
tblVehicleEF	MHD	4.49	1.19
tblVehicleEF	MHD	141.56	84.01
tblVehicleEF	MHD	1,195.31	1,109.33
tblVehicleEF	MHD	51.17	10.07
tblVehicleEF	MHD	0.41	0.52

tblVehicleEF	MHD	1.23	1.47
tblVehicleEF	MHD	11.80	1.66
tblVehicleEF	MHD	1.4300e-004	5.0000e-004
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	3.3220e-003	7.2000e-003
tblVehicleEF	MHD	7.2900e-004	1.0000e-004
tblVehicleEF	MHD	1.3700e-004	5.0000e-004
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.1710e-003	6.9000e-003
tblVehicleEF	MHD	6.7100e-004	1.0000e-004
tblVehicleEF	MHD	3.1600e-004	4.0000e-004
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	1.8000e-004	2.0000e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.26	0.05
tblVehicleEF	MHD	1.3620e-003	8.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.9000e-004	1.0000e-004
tblVehicleEF	MHD	3.1600e-004	4.0000e-004
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	1.8000e-004	2.0000e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	0.29	0.06

tblVehicleEF	OBUS	0.01	8.8000e-003
tblVehicleEF	OBUS	7.3380e-003	9.0000e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.24	0.50
tblVehicleEF	OBUS	0.49	0.98
tblVehicleEF	OBUS	5.24	2.88
tblVehicleEF	OBUS	103.96	65.66
tblVehicleEF	OBUS	1,297.59	1,496.24
tblVehicleEF	OBUS	67.57	21.75
tblVehicleEF	OBUS	0.22	0.23
tblVehicleEF	OBUS	0.89	1.13
tblVehicleEF	OBUS	2.54	0.68
tblVehicleEF	OBUS	2.0000e-005	1.0000e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	2.7140e-003	6.1000e-003
tblVehicleEF	OBUS	8.8900e-004	2.0000e-004
tblVehicleEF	OBUS	2.0000e-005	1.0000e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	2.5730e-003	5.8000e-003
tblVehicleEF	OBUS	8.1700e-004	2.0000e-004
tblVehicleEF	OBUS	2.3000e-003	1.7000e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	8.0300e-004	8.0000e-004
tblVehicleEF	OBUS	0.05	0.05
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.33	0.14

tblVehicleEF	OBUS	1.0040e-003	6.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.6800e-004	2.0000e-004
tblVehicleEF	OBUS	2.3000e-003	1.7000e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	8.0300e-004	8.0000e-004
tblVehicleEF	OBUS	0.06	0.07
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.36	0.15
tblVehicleEF	OBUS	0.01	8.8000e-003
tblVehicleEF	OBUS	7.5110e-003	9.0000e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.24	0.50
tblVehicleEF	OBUS	0.50	0.98
tblVehicleEF	OBUS	4.76	2.88
tblVehicleEF	OBUS	109.15	65.66
tblVehicleEF	OBUS	1,297.59	1,496.24
tblVehicleEF	OBUS	67.57	21.75
tblVehicleEF	OBUS	0.23	0.23
tblVehicleEF	OBUS	0.84	1.13
tblVehicleEF	OBUS	2.49	0.68
tblVehicleEF	OBUS	1.7000e-005	1.0000e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	2.7140e-003	6.1000e-003
tblVehicleEF	OBUS	8.8900e-004	2.0000e-004
tblVehicleEF	OBUS	1.6000e-005	1.0000e-004

tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	2.5730e-003	5.8000e-003
tblVehicleEF	OBUS	8.1700e-004	2.0000e-004
tblVehicleEF	OBUS	5.3950e-003	1.7000e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	1.5680e-003	8.0000e-004
tblVehicleEF	OBUS	0.05	0.05
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.31	0.14
tblVehicleEF	OBUS	1.0530e-003	6.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.5900e-004	2.0000e-004
tblVehicleEF	OBUS	5.3950e-003	1.7000e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.04	0.06
tblVehicleEF	OBUS	1.5680e-003	8.0000e-004
tblVehicleEF	OBUS	0.06	0.07
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.34	0.15
tblVehicleEF	OBUS	0.01	8.8000e-003
tblVehicleEF	OBUS	7.1320e-003	9.0000e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.25	0.50
tblVehicleEF	OBUS	0.48	0.98
tblVehicleEF	OBUS	5.86	2.88
tblVehicleEF	OBUS	96.79	65.66

tblVehicleEF	OBUS	1,297.59	1,496.24
tblVehicleEF	OBUS	67.57	21.75
tblVehicleEF	OBUS	0.21	0.23
tblVehicleEF	OBUS	0.91	1.13
tblVehicleEF	OBUS	2.61	0.68
tblVehicleEF	OBUS	2.5000e-005	1.0000e-004
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	2.7140e-003	6.1000e-003
tblVehicleEF	OBUS	8.8900e-004	2.0000e-004
tblVehicleEF	OBUS	2.4000e-005	1.0000e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	2.5730e-003	5.8000e-003
tblVehicleEF	OBUS	8.1700e-004	2.0000e-004
tblVehicleEF	OBUS	7.5100e-004	1.7000e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	3.7600e-004	8.0000e-004
tblVehicleEF	OBUS	0.04	0.05
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.35	0.14
tblVehicleEF	OBUS	9.3500e-004	6.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.7800e-004	2.0000e-004
tblVehicleEF	OBUS	7.5100e-004	1.7000e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	3.7600e-004	8.0000e-004

tblVehicleEF	OBUS	0.06	0.07
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	0.39	0.15
tblVehicleEF	SBUS	0.81	0.02
tblVehicleEF	SBUS	0.01	2.6000e-003
tblVehicleEF	SBUS	0.07	1.3000e-003
tblVehicleEF	SBUS	5.46	1.26
tblVehicleEF	SBUS	0.72	0.22
tblVehicleEF	SBUS	5.44	0.19
tblVehicleEF	SBUS	1,239.29	299.60
tblVehicleEF	SBUS	1,106.98	991.09
tblVehicleEF	SBUS	36.73	1.09
tblVehicleEF	SBUS	9.08	2.23
tblVehicleEF	SBUS	3.33	2.75
tblVehicleEF	SBUS	15.09	1.56
tblVehicleEF	SBUS	7.0840e-003	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	5.5000e-004	0.00
tblVehicleEF	SBUS	6.7770e-003	1.5000e-003
tblVehicleEF	SBUS	2.7250e-003	2.9000e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	5.0600e-004	0.00
tblVehicleEF	SBUS	4.0480e-003	1.0000e-004
tblVehicleEF	SBUS	0.03	8.0000e-004
tblVehicleEF	SBUS	0.64	0.09
tblVehicleEF	SBUS	1.4420e-003	0.00

tblVehicleEF	SBUS	0.10	0.04
tblVehicleEF	SBUS	0.01	1.6000e-003
tblVehicleEF	SBUS	0.30	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.6200e-004	0.00
tblVehicleEF	SBUS	4.0480e-003	1.0000e-004
tblVehicleEF	SBUS	0.03	8.0000e-004
tblVehicleEF	SBUS	0.92	0.12
tblVehicleEF	SBUS	1.4420e-003	0.00
tblVehicleEF	SBUS	0.12	0.05
tblVehicleEF	SBUS	0.01	1.6000e-003
tblVehicleEF	SBUS	0.32	8.0000e-003
tblVehicleEF	SBUS	0.81	0.02
tblVehicleEF	SBUS	0.01	2.6000e-003
tblVehicleEF	SBUS	0.06	1.3000e-003
tblVehicleEF	SBUS	5.34	1.26
tblVehicleEF	SBUS	0.74	0.22
tblVehicleEF	SBUS	3.61	0.19
tblVehicleEF	SBUS	1,302.15	299.60
tblVehicleEF	SBUS	1,106.98	991.09
tblVehicleEF	SBUS	36.73	1.09
tblVehicleEF	SBUS	9.37	2.23
tblVehicleEF	SBUS	3.16	2.75
tblVehicleEF	SBUS	15.05	1.56
tblVehicleEF	SBUS	5.9720e-003	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01

tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	5.5000e-004	0.00
tblVehicleEF	SBUS	5.7130e-003	1.5000e-003
tblVehicleEF	SBUS	2.7250e-003	2.9000e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	5.0600e-004	0.00
tblVehicleEF	SBUS	9.4300e-003	1.0000e-004
tblVehicleEF	SBUS	0.03	8.0000e-004
tblVehicleEF	SBUS	0.64	0.09
tblVehicleEF	SBUS	2.7690e-003	0.00
tblVehicleEF	SBUS	0.10	0.04
tblVehicleEF	SBUS	0.01	1.6000e-003
tblVehicleEF	SBUS	0.24	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.3100e-004	0.00
tblVehicleEF	SBUS	9.4300e-003	1.0000e-004
tblVehicleEF	SBUS	0.03	8.0000e-004
tblVehicleEF	SBUS	0.92	0.12
tblVehicleEF	SBUS	2.7690e-003	0.00
tblVehicleEF	SBUS	0.12	0.05
tblVehicleEF	SBUS	0.01	1.6000e-003
tblVehicleEF	SBUS	0.26	8.0000e-003
tblVehicleEF	SBUS	0.81	0.02
tblVehicleEF	SBUS	0.01	2.6000e-003
tblVehicleEF	SBUS	0.09	1.3000e-003
tblVehicleEF	SBUS	5.62	1.26

tblVehicleEF	SBUS	0.70	0.22
tblVehicleEF	SBUS	7.64	0.19
tblVehicleEF	SBUS	1,152.47	299.60
tblVehicleEF	SBUS	1,106.98	991.09
tblVehicleEF	SBUS	36.73	1.09
tblVehicleEF	SBUS	8.67	2.23
tblVehicleEF	SBUS	3.40	2.75
tblVehicleEF	SBUS	15.12	1.56
tblVehicleEF	SBUS	8.6190e-003	1.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	5.5000e-004	0.00
tblVehicleEF	SBUS	8.2460e-003	1.5000e-003
tblVehicleEF	SBUS	2.7250e-003	2.9000e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	5.0600e-004	0.00
tblVehicleEF	SBUS	1.3680e-003	1.0000e-004
tblVehicleEF	SBUS	0.03	8.0000e-004
tblVehicleEF	SBUS	0.65	0.09
tblVehicleEF	SBUS	6.8800e-004	0.00
tblVehicleEF	SBUS	0.10	0.04
tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.36	7.3000e-003
tblVehicleEF	SBUS	0.01	2.8000e-003
tblVehicleEF	SBUS	0.01	9.4000e-003
tblVehicleEF	SBUS	4.9800e-004	0.00
tblVehicleEF	SBUS	1.3680e-003	1.0000e-004

tblVehicleEF	SBUS	0.03	8.0000e-004
tblVehicleEF	SBUS	0.93	0.12
tblVehicleEF	SBUS	6.8800e-004	0.00
tblVehicleEF	SBUS	0.12	0.05
tblVehicleEF	SBUS	0.02	1.6000e-003
tblVehicleEF	SBUS	0.39	8.0000e-003
tblVehicleEF	UBUS	0.72	1.10
tblVehicleEF	UBUS	0.08	1.5000e-003
tblVehicleEF	UBUS	6.09	8.13
tblVehicleEF	UBUS	13.88	0.25
tblVehicleEF	UBUS	1,862.73	1,559.20
tblVehicleEF	UBUS	160.85	2.75
tblVehicleEF	UBUS	4.54	0.64
tblVehicleEF	UBUS	11.79	0.03
tblVehicleEF	UBUS	0.46	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.07	4.9000e-003
tblVehicleEF	UBUS	1.3550e-003	0.00
tblVehicleEF	UBUS	0.20	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.07	4.7000e-003
tblVehicleEF	UBUS	1.2450e-003	0.00
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	0.12	8.0000e-004
tblVehicleEF	UBUS	4.3490e-003	1.0000e-004
tblVehicleEF	UBUS	0.43	0.02
tblVehicleEF	UBUS	0.03	1.0000e-004

tblVehicleEF	UBUS	1.11	5.3000e-003
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	1.8600e-003	0.00
tblVehicleEF	UBUS	0.01	1.0000e-004
tblVehicleEF	UBUS	0.12	8.0000e-004
tblVehicleEF	UBUS	4.3490e-003	1.0000e-004
tblVehicleEF	UBUS	1.18	1.12
tblVehicleEF	UBUS	0.03	1.0000e-004
tblVehicleEF	UBUS	1.21	5.8000e-003
tblVehicleEF	UBUS	0.72	1.10
tblVehicleEF	UBUS	0.07	1.5000e-003
tblVehicleEF	UBUS	6.18	8.13
tblVehicleEF	UBUS	11.13	0.25
tblVehicleEF	UBUS	1,862.73	1,559.20
tblVehicleEF	UBUS	160.85	2.75
tblVehicleEF	UBUS	4.28	0.64
tblVehicleEF	UBUS	11.67	0.03
tblVehicleEF	UBUS	0.46	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.07	4.9000e-003
tblVehicleEF	UBUS	1.3550e-003	0.00
tblVehicleEF	UBUS	0.20	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.07	4.7000e-003
tblVehicleEF	UBUS	1.2450e-003	0.00
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.15	8.0000e-004

tblVehicleEF	UBUS	8.7600e-003	1.0000e-004
tblVehicleEF	UBUS	0.44	0.02
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.97	5.3000e-003
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	1.8120e-003	0.00
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	0.15	8.0000e-004
tblVehicleEF	UBUS	8.7600e-003	1.0000e-004
tblVehicleEF	UBUS	1.20	1.12
tblVehicleEF	UBUS	0.02	1.0000e-004
tblVehicleEF	UBUS	1.06	5.8000e-003
tblVehicleEF	UBUS	0.71	1.10
tblVehicleEF	UBUS	0.09	1.5000e-003
tblVehicleEF	UBUS	5.99	8.13
tblVehicleEF	UBUS	17.47	0.25
tblVehicleEF	UBUS	1,862.73	1,559.20
tblVehicleEF	UBUS	160.85	2.75
tblVehicleEF	UBUS	4.66	0.64
tblVehicleEF	UBUS	11.94	0.03
tblVehicleEF	UBUS	0.46	0.08
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.07	4.9000e-003
tblVehicleEF	UBUS	1.3550e-003	0.00
tblVehicleEF	UBUS	0.20	0.03
tblVehicleEF	UBUS	3.0000e-003	7.2000e-003
tblVehicleEF	UBUS	0.07	4.7000e-003

tblVehicleEF	UBUS	1.2450e-003	0.00
tblVehicleEF	UBUS	3.4710e-003	1.0000e-004
tblVehicleEF	UBUS	0.12	8.0000e-004
tblVehicleEF	UBUS	2.0260e-003	1.0000e-004
tblVehicleEF	UBUS	0.42	0.02
tblVehicleEF	UBUS	0.03	1.0000e-004
tblVehicleEF	UBUS	1.27	5.3000e-003
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	1.9220e-003	0.00
tblVehicleEF	UBUS	3.4710e-003	1.0000e-004
tblVehicleEF	UBUS	0.12	8.0000e-004
tblVehicleEF	UBUS	2.0260e-003	1.0000e-004
tblVehicleEF	UBUS	1.16	1.12
tblVehicleEF	UBUS	0.03	1.0000e-004
tblVehicleEF	UBUS	1.39	5.8000e-003
tblVehicleTrips	CC_TTP	0.00	61.60
tblVehicleTrips	CC_TTP	0.00	61.60
tblVehicleTrips	CNW_TTP	0.00	19.00
tblVehicleTrips	CNW_TTP	0.00	19.00
tblVehicleTrips	CW_TTP	0.00	19.40
tblVehicleTrips	CW_TTP	0.00	19.40
tblVehicleTrips	DV_TP	0.00	38.00
tblVehicleTrips	DV_TP	0.00	38.00
tblVehicleTrips	PB_TP	0.00	4.00
tblVehicleTrips	PB_TP	0.00	4.00
tblVehicleTrips	PR_TP	0.00	58.00
tblVehicleTrips	PR_TP	0.00	58.00

tblVehicleTrips	ST_TR	1,448.33	364.50
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	ST_TR	8.19	10.40
tblVehicleTrips	ST_TR	0.00	10.40
tblVehicleTrips	ST_TR	0.00	131.10
tblVehicleTrips	SU_TR	1,182.08	364.50
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	SU_TR	5.95	10.40
tblVehicleTrips	SU_TR	0.00	10.40
tblVehicleTrips	SU_TR	0.00	131.10
tblVehicleTrips	WD_TR	845.60	364.50
tblVehicleTrips	WD_TR	6.97	0.00
tblVehicleTrips	WD_TR	8.17	10.40
tblVehicleTrips	WD_TR	0.00	10.40
tblVehicleTrips	WD_TR	0.00	131.10
tblWater	IndoorWaterUseRate	0.00	5,073,354.00
tblWater	IndoorWaterUseRate	0.00	5,073,354.00
tblWater	OutdoorWaterUseRate	0.00	563,706.00
tblWater	OutdoorWaterUseRate	0.00	563,706.00

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	0.4792	3.9511	3.8902	0.0116	1.2177	0.1331	1.3508	0.5297	0.1235	0.6531	0.0000	1,044.4897	1,044.4897	0.1567	0.0000	1,048.4074
2024	0.5147	3.7206	4.3908	0.0154	0.8833	0.0862	0.9695	0.2379	0.0810	0.3189	0.0000	1,406.7205	1,406.7205	0.1315	0.0000	1,410.0084
2025	2.2818	0.1922	0.3758	7.0000e-004	0.0263	9.1300e-003	0.0354	6.9800e-003	8.4800e-003	0.0155	0.0000	61.5600	61.5600	0.0130	0.0000	61.8856
Maximum	**2.2818**	**3.9511**	**4.3908**	**0.0154**	**1.2177**	**0.1331**	**1.3508**	**0.5297**	**0.1235**	**0.6531**	**0.0000**	**1,406.7205**	**1,406.7205**	**0.1567**	**0.0000**	**1,410.0084**

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	0.4792	3.9511	3.8902	0.0116	0.8173	0.1331	0.9504	0.3109	0.1235	0.4343	0.0000	1,044.4892	1,044.4892	0.1567	0.0000	1,048.4069
2024	0.5147	3.7206	4.3908	0.0154	0.8833	0.0862	0.9695	0.2379	0.0810	0.3189	0.0000	1,406.7201	1,406.7201	0.1315	0.0000	1,410.0081
2025	2.2818	0.1922	0.3758	7.0000e-004	0.0263	9.1300e-003	0.0354	6.9800e-003	8.4800e-003	0.0155	0.0000	61.5599	61.5599	0.0130	0.0000	61.8856
Maximum	**2.2818**	**3.9511**	**4.3908**	**0.0154**	**0.8833**	**0.1331**	**0.9695**	**0.3109**	**0.1235**	**0.4343**	**0.0000**	**1,406.7201**	**1,406.7201**	**0.1567**	**0.0000**	**1,410.0081**

Tachi Palace EE - Kings County, Annual

	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**	**18.82**	**0.00**	**17.00**	**28.25**	**0.00**	**22.16**	**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	**1-1-2023**	**3-31-2023**	0.9948	0.9948
2	**4-1-2023**	**6-30-2023**	1.2152	1.2152
3	**7-1-2023**	**9-30-2023**	1.1164	1.1164
4	**10-1-2023**	**12-31-2023**	1.1280	1.1280
5	**1-1-2024**	**3-31-2024**	1.0659	1.0659
6	**4-1-2024**	**6-30-2024**	1.0554	1.0554
7	**7-1-2024**	**9-30-2024**	1.0670	1.0670
8	**10-1-2024**	**12-31-2024**	1.0465	1.0465
9	**1-1-2025**	**3-31-2025**	1.7363	1.7363
10	**4-1-2025**	**6-30-2025**	0.7346	0.7346
		Highest	1.7363	1.7363

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	1.4460	2.0000e-004	0.0216	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0422	0.0422	1.1000e-004	0.0000	0.0449
Energy	0.0378	0.3434	0.2885	2.0600e-003		0.0261	0.0261		0.0261	0.0261	0.0000	1,356.9044	1,356.9044	0.0516	0.0161	1,362.9779
Mobile	1.4019	8.3101	13.4943	0.0477	3.2399	0.0561	3.2960	0.8699	0.0532	0.9231	0.0000	4,543.5508	4,543.5508	0.2165	0.0000	4,548.9628
Stationary	0.4330	0.2400	1.8463	5.2900e-003		0.0674	0.0674		0.0674	0.0674	0.0000	957.3081	957.3081	0.0647	0.0000	958.9248
Waste						0.0000	0.0000		0.0000	0.0000	95.5133	0.0000	95.5133	5.6447	0.0000	236.6303
Water						0.0000	0.0000		0.0000	0.0000	12.3061	63.0586	75.3648	1.2668	0.0304	116.1045
Total	**3.3186**	**8.8937**	**15.6507**	**0.0551**	**3.2399**	**0.1497**	**3.3896**	**0.8699**	**0.1468**	**1.0167**	**107.8195**	**6,920.8641**	**7,028.6836**	**7.2444**	**0.0465**	**7,223.6451**

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	1.4460	2.0000e-004	0.0216	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0422	0.0422	1.1000e-004	0.0000	0.0449
Energy	0.0378	0.3434	0.2885	2.0600e-003		0.0261	0.0261		0.0261	0.0261	0.0000	1,290.6376	1,290.6376	0.0486	0.0154	1,296.4514
Mobile	1.4019	8.3101	13.4943	0.0477	3.2399	0.0561	3.2960	0.8699	0.0532	0.9231	0.0000	4,543.5508	4,543.5508	0.2165	0.0000	4,548.9628
Stationary	0.4330	0.2400	1.8463	5.2900e-003		0.0674	0.0674		0.0674	0.0674	0.0000	957.3081	957.3081	0.0647	0.0000	958.9248
Waste						0.0000	0.0000		0.0000	0.0000	47.7567	0.0000	47.7567	2.8223	0.0000	118.3151
Water						0.0000	0.0000		0.0000	0.0000	9.8449	50.8468	60.6916	1.0135	0.0244	93.2850
Total	**3.3186**	**8.8937**	**15.6507**	**0.0551**	**3.2399**	**0.1497**	**3.3896**	**0.8699**	**0.1468**	**1.0167**	**57.6016**	**6,842.3854**	**6,899.9870**	**4.1657**	**0.0398**	**7,015.9840**

	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**	**46.58**	**1.13**	**1.83**	**42.50**	**14.41**	**2.87**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2023	12/30/2022	5	0	
2	Site Preparation	Site Preparation	1/1/2023	3/24/2023	5	60	
3	Grading	Grading	3/25/2023	6/16/2023	5	60	
4	Building Construction	Building Construction	6/17/2023	12/27/2024	5	400	
5	Paving	Paving	12/28/2024	2/21/2025	5	40	
6	Architectural Coating	Architectural Coating	2/22/2025	4/18/2025	5	40	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 8

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 448,500; Non-Residential Outdoor: 149,500; Striped Parking Area: 48,000 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
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
Demolition	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	457.00	180.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	91.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.3 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					0.5420	0.0000	0.5420	0.2979	0.0000	0.2979	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0798	0.8257	0.5473	1.1400e-003		0.0380	0.0380		0.0349	0.0349	0.0000	100.3521	100.3521	0.0325	0.0000	101.1635
Total	**0.0798**	**0.8257**	**0.5473**	**1.1400e-003**	**0.5420**	**0.0380**	**0.5800**	**0.2979**	**0.0349**	**0.3329**	**0.0000**	**100.3521**	**100.3521**	**0.0325**	**0.0000**	**101.1635**

3.3 Site Preparation - 2023

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	2.6600e-003	1.9700e-003	0.0190	6.0000e-005	6.7500e-003	4.0000e-005	6.7900e-003	1.7900e-003	4.0000e-005	1.8300e-003	0.0000	5.1013	5.1013	1.4000e-004	0.0000	5.1049
Total	**2.6600e-003**	**1.9700e-003**	**0.0190**	**6.0000e-005**	**6.7500e-003**	**4.0000e-005**	**6.7900e-003**	**1.7900e-003**	**4.0000e-005**	**1.8300e-003**	**0.0000**	**5.1013**	**5.1013**	**1.4000e-004**	**0.0000**	**5.1049**

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					0.2439	0.0000	0.2439	0.1341	0.0000	0.1341	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0798	0.8257	0.5473	1.1400e-003		0.0380	0.0380		0.0349	0.0349	0.0000	100.3520	100.3520	0.0325	0.0000	101.1634
Total	**0.0798**	**0.8257**	**0.5473**	**1.1400e-003**	**0.2439**	**0.0380**	**0.2819**	**0.1341**	**0.0349**	**0.1690**	**0.0000**	**100.3520**	**100.3520**	**0.0325**	**0.0000**	**101.1634**

3.3 Site Preparation - 2023

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	2.6600e-003	1.9700e-003	0.0190	6.0000e-005	6.7500e-003	4.0000e-005	6.7900e-003	1.7900e-003	4.0000e-005	1.8300e-003	0.0000	5.1013	5.1013	1.4000e-004	0.0000	5.1049
Total	**2.6600e-003**	**1.9700e-003**	**0.0190**	**6.0000e-005**	**6.7500e-003**	**4.0000e-005**	**6.7900e-003**	**1.7900e-003**	**4.0000e-005**	**1.8300e-003**	**0.0000**	**5.1013**	**5.1013**	**1.4000e-004**	**0.0000**	**5.1049**

3.4 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					0.1860	0.0000	0.1860	0.0999	0.0000	0.0999	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0997	1.0355	0.8415	1.8600e-003		0.0427	0.0427		0.0393	0.0393	0.0000	163.6056	163.6056	0.0529	0.0000	164.9285
Total	**0.0997**	**1.0355**	**0.8415**	**1.8600e-003**	**0.1860**	**0.0427**	**0.2287**	**0.0999**	**0.0393**	**0.1392**	**0.0000**	**163.6056**	**163.6056**	**0.0529**	**0.0000**	**164.9285**

3.4 Grading - 2023

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	2.9500e-003	2.1800e-003	0.0211	6.0000e-005	7.4900e-003	4.0000e-005	7.5400e-003	1.9900e-003	4.0000e-005	2.0300e-003	0.0000	5.6681	5.6681	1.6000e-004	0.0000	5.6721
Total	**2.9500e-003**	**2.1800e-003**	**0.0211**	**6.0000e-005**	**7.4900e-003**	**4.0000e-005**	**7.5400e-003**	**1.9900e-003**	**4.0000e-005**	**2.0300e-003**	**0.0000**	**5.6681**	**5.6681**	**1.6000e-004**	**0.0000**	**5.6721**

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					0.0837	0.0000	0.0837	0.0450	0.0000	0.0450	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0997	1.0355	0.8415	1.8600e-003		0.0427	0.0427		0.0393	0.0393	0.0000	163.6054	163.6054	0.0529	0.0000	164.9283
Total	**0.0997**	**1.0355**	**0.8415**	**1.8600e-003**	**0.0837**	**0.0427**	**0.1264**	**0.0450**	**0.0393**	**0.0843**	**0.0000**	**163.6054**	**163.6054**	**0.0529**	**0.0000**	**164.9283**

3.4 Grading - 2023

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	2.9500e-003	2.1800e-003	0.0211	6.0000e-005	7.4900e-003	4.0000e-005	7.5400e-003	1.9900e-003	4.0000e-005	2.0300e-003	0.0000	5.6681	5.6681	1.6000e-004	0.0000	5.6721
Total	**2.9500e-003**	**2.1800e-003**	**0.0211**	**6.0000e-005**	**7.4900e-003**	**4.0000e-005**	**7.5400e-003**	**1.9900e-003**	**4.0000e-005**	**2.0300e-003**	**0.0000**	**5.6681**	**5.6681**	**1.6000e-004**	**0.0000**	**5.6721**

3.5 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	0.1101	1.0069	1.1371	1.8900e-003		0.0490	0.0490		0.0461	0.0461	0.0000	162.2633	162.2633	0.0386	0.0000	163.2283
Total	**0.1101**	**1.0069**	**1.1371**	**1.8900e-003**		**0.0490**	**0.0490**		**0.0461**	**0.0461**	**0.0000**	**162.2633**	**162.2633**	**0.0386**	**0.0000**	**163.2283**

3.5 Building Construction - 2023

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	0.0267	0.9623	0.1990	3.2200e-003	0.0759	9.2000e-004	0.0768	0.0219	8.8000e-004	0.0228	0.0000	305.2931	305.2931	0.0240	0.0000	305.8933
Worker	0.1574	0.1165	1.1251	3.3400e-003	0.3996	2.3700e-003	0.4020	0.1062	2.1800e-003	0.1083	0.0000	302.2061	302.2061	8.4300e-003	0.0000	302.4169
Total	**0.1841**	**1.0788**	**1.3242**	**6.5600e-003**	**0.4755**	**3.2900e-003**	**0.4788**	**0.1281**	**3.0600e-003**	**0.1311**	**0.0000**	**607.4992**	**607.4992**	**0.0324**	**0.0000**	**608.3101**

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	0.1101	1.0069	1.1371	1.8900e-003		0.0490	0.0490		0.0461	0.0461	0.0000	162.2631	162.2631	0.0386	0.0000	163.2281
Total	**0.1101**	**1.0069**	**1.1371**	**1.8900e-003**		**0.0490**	**0.0490**		**0.0461**	**0.0461**	**0.0000**	**162.2631**	**162.2631**	**0.0386**	**0.0000**	**163.2281**

3.5 Building Construction - 2023

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	0.0267	0.9623	0.1990	3.2200e-003	0.0759	9.2000e-004	0.0768	0.0219	8.8000e-004	0.0228	0.0000	305.2931	305.2931	0.0240	0.0000	305.8933
Worker	0.1574	0.1165	1.1251	3.3400e-003	0.3996	2.3700e-003	0.4020	0.1062	2.1800e-003	0.1083	0.0000	302.2061	302.2061	8.4300e-003	0.0000	302.4169
Total	**0.1841**	**1.0788**	**1.3242**	**6.5600e-003**	**0.4755**	**3.2900e-003**	**0.4788**	**0.1281**	**3.0600e-003**	**0.1311**	**0.0000**	**607.4992**	**607.4992**	**0.0324**	**0.0000**	**608.3101**

3.5 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	0.1913	1.7477	2.1017	3.5000e-003		0.0797	0.0797		0.0750	0.0750	0.0000	301.4038	301.4038	0.0713	0.0000	303.1857
Total	**0.1913**	**1.7477**	**2.1017**	**3.5000e-003**		**0.0797**	**0.0797**		**0.0750**	**0.0750**	**0.0000**	**301.4038**	**301.4038**	**0.0713**	**0.0000**	**303.1857**

3.5 Building Construction - 2024

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	0.0480	1.7685	0.3497	5.9300e-003	0.1410	1.6800e-003	0.1426	0.0407	1.6100e-003	0.0423	0.0000	562.2733	562.2733	0.0456	0.0000	563.4120
Worker	0.2740	0.1948	1.9243	5.9800e-003	0.7421	4.3000e-003	0.7464	0.1971	3.9600e-003	0.2011	0.0000	540.9041	540.9041	0.0141	0.0000	541.2553
Total	**0.3220**	**1.9633**	**2.2740**	**0.0119**	**0.8831**	**5.9800e-003**	**0.8891**	**0.2378**	**5.5700e-003**	**0.2434**	**0.0000**	**1,103.1774**	**1,103.1774**	**0.0596**	**0.0000**	**1,104.6673**

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	0.1913	1.7477	2.1017	3.5000e-003		0.0797	0.0797		0.0750	0.0750	0.0000	301.4035	301.4035	0.0713	0.0000	303.1853
Total	**0.1913**	**1.7477**	**2.1017**	**3.5000e-003**		**0.0797**	**0.0797**		**0.0750**	**0.0750**	**0.0000**	**301.4035**	**301.4035**	**0.0713**	**0.0000**	**303.1853**

3.5 Building Construction - 2024

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	0.0480	1.7685	0.3497	5.9300e-003	0.1410	1.6800e-003	0.1426	0.0407	1.6100e-003	0.0423	0.0000	562.2733	562.2733	0.0456	0.0000	563.4120
Worker	0.2740	0.1948	1.9243	5.9800e-003	0.7421	4.3000e-003	0.7464	0.1971	3.9600e-003	0.2011	0.0000	540.9041	540.9041	0.0141	0.0000	541.2553
Total	**0.3220**	**1.9633**	**2.2740**	**0.0119**	**0.8831**	**5.9800e-003**	**0.8891**	**0.2378**	**5.5700e-003**	**0.2434**	**0.0000**	**1,103.1774**	**1,103.1774**	**0.0596**	**0.0000**	**1,104.6673**

3.6 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	9.9000e-004	9.5200e-003	0.0146	2.0000e-005		4.7000e-004	4.7000e-004		4.3000e-004	4.3000e-004	0.0000	2.0027	2.0027	6.5000e-004	0.0000	2.0189
Paving	3.3000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3200e-003**	**9.5200e-003**	**0.0146**	**2.0000e-005**		**4.7000e-004**	**4.7000e-004**		**4.3000e-004**	**4.3000e-004**	**0.0000**	**2.0027**	**2.0027**	**6.5000e-004**	**0.0000**	**2.0189**

3.6 Paving - 2024

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	7.0000e-005	5.0000e-005	4.9000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1366	0.1366	0.0000	0.0000	0.1367
Total	**7.0000e-005**	**5.0000e-005**	**4.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1366**	**0.1366**	**0.0000**	**0.0000**	**0.1367**

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	9.9000e-004	9.5200e-003	0.0146	2.0000e-005		4.7000e-004	4.7000e-004		4.3000e-004	4.3000e-004	0.0000	2.0027	2.0027	6.5000e-004	0.0000	2.0188
Paving	3.3000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3200e-003**	**9.5200e-003**	**0.0146**	**2.0000e-005**		**4.7000e-004**	**4.7000e-004**		**4.3000e-004**	**4.3000e-004**	**0.0000**	**2.0027**	**2.0027**	**6.5000e-004**	**0.0000**	**2.0188**

3.6 Paving - 2024

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	7.0000e-005	5.0000e-005	4.9000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1366	0.1366	0.0000	0.0000	0.1367
Total	**7.0000e-005**	**5.0000e-005**	**4.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1366**	**0.1366**	**0.0000**	**0.0000**	**0.1367**

3.6 Paving - 2025

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	0.0174	0.1631	0.2770	4.3000e-004		7.9500e-003	7.9500e-003		7.3200e-003	7.3200e-003	0.0000	38.0366	38.0366	0.0123	0.0000	38.3441
Paving	6.2200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0236**	**0.1631**	**0.2770**	**4.3000e-004**		**7.9500e-003**	**7.9500e-003**		**7.3200e-003**	**7.3200e-003**	**0.0000**	**38.0366**	**38.0366**	**0.0123**	**0.0000**	**38.3441**

3.6 Paving - 2025

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	1.2400e-003	8.4000e-004	8.4800e-003	3.0000e-005	3.5600e-003	2.0000e-005	3.5800e-003	9.5000e-004	2.0000e-005	9.6000e-004	0.0000	2.4935	2.4935	6.0000e-005	0.0000	2.4950
Total	**1.2400e-003**	**8.4000e-004**	**8.4800e-003**	**3.0000e-005**	**3.5600e-003**	**2.0000e-005**	**3.5800e-003**	**9.5000e-004**	**2.0000e-005**	**9.6000e-004**	**0.0000**	**2.4935**	**2.4935**	**6.0000e-005**	**0.0000**	**2.4950**

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	0.0174	0.1631	0.2770	4.3000e-004		7.9500e-003	7.9500e-003		7.3200e-003	7.3200e-003	0.0000	38.0365	38.0365	0.0123	0.0000	38.3441
Paving	6.2200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0236**	**0.1631**	**0.2770**	**4.3000e-004**		**7.9500e-003**	**7.9500e-003**		**7.3200e-003**	**7.3200e-003**	**0.0000**	**38.0365**	**38.0365**	**0.0123**	**0.0000**	**38.3441**

3.6 Paving - 2025

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	1.2400e-003	8.4000e-004	8.4800e-003	3.0000e-005	3.5600e-003	2.0000e-005	3.5800e-003	9.5000e-004	2.0000e-005	9.6000e-004	0.0000	2.4935	2.4935	6.0000e-005	0.0000	2.4950
Total	**1.2400e-003**	**8.4000e-004**	**8.4800e-003**	**3.0000e-005**	**3.5600e-003**	**2.0000e-005**	**3.5800e-003**	**9.5000e-004**	**2.0000e-005**	**9.6000e-004**	**0.0000**	**2.4935**	**2.4935**	**6.0000e-005**	**0.0000**	**2.4950**

3.7 Architectural Coating - 2025

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	2.2457					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.4200e-003	0.0229	0.0362	6.0000e-005		1.0300e-003	1.0300e-003		1.0300e-003	1.0300e-003	0.0000	5.1065	5.1065	2.8000e-004	0.0000	5.1135
Total	**2.2491**	**0.0229**	**0.0362**	**6.0000e-005**		**1.0300e-003**	**1.0300e-003**		**1.0300e-003**	**1.0300e-003**	**0.0000**	**5.1065**	**5.1065**	**2.8000e-004**	**0.0000**	**5.1135**

3.7 Architectural Coating - 2025

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	7.8900e-003	5.3900e-003	0.0541	1.8000e-004	0.0227	1.3000e-004	0.0229	6.0400e-003	1.2000e-004	6.1600e-003	0.0000	15.9234	15.9234	3.9000e-004	0.0000	15.9330
Total	**7.8900e-003**	**5.3900e-003**	**0.0541**	**1.8000e-004**	**0.0227**	**1.3000e-004**	**0.0229**	**6.0400e-003**	**1.2000e-004**	**6.1600e-003**	**0.0000**	**15.9234**	**15.9234**	**3.9000e-004**	**0.0000**	**15.9330**

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	2.2457					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.4200e-003	0.0229	0.0362	6.0000e-005		1.0300e-003	1.0300e-003		1.0300e-003	1.0300e-003	0.0000	5.1065	5.1065	2.8000e-004	0.0000	5.1135
Total	**2.2491**	**0.0229**	**0.0362**	**6.0000e-005**		**1.0300e-003**	**1.0300e-003**		**1.0300e-003**	**1.0300e-003**	**0.0000**	**5.1065**	**5.1065**	**2.8000e-004**	**0.0000**	**5.1135**

3.7 Architectural Coating - 2025

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	7.8900e-003	5.3900e-003	0.0541	1.8000e-004	0.0227	1.3000e-004	0.0229	6.0400e-003	1.2000e-004	6.1600e-003	0.0000	15.9234	15.9234	3.9000e-004	0.0000	15.9330
Total	**7.8900e-003**	**5.3900e-003**	**0.0541**	**1.8000e-004**	**0.0227**	**1.3000e-004**	**0.0229**	**6.0400e-003**	**1.2000e-004**	**6.1600e-003**	**0.0000**	**15.9234**	**15.9234**	**3.9000e-004**	**0.0000**	**15.9330**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Implement Trip Reduction Program

	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	1.4019	8.3101	13.4943	0.0477	3.2399	0.0561	3.2960	0.8699	0.0532	0.9231	0.0000	4,543.5508	4,543.5508	0.2165	0.0000	4,548.9628
Unmitigated	1.4019	8.3101	13.4943	0.0477	3.2399	0.0561	3.2960	0.8699	0.0532	0.9231	0.0000	4,543.5508	4,543.5508	0.2165	0.0000	4,548.9628

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Convenience Market With Gas Pumps	2,187.00	2,187.00	2187.00	1,073,079	1,073,079
General Light Industry	0.00	0.00	0.00		
Hotel	2,080.00	2,080.00	2080.00	4,179,071	4,179,071
Parking Lot	0.00	0.00	0.00		
Unenclosed Parking with Elevator	0.00	0.00	0.00		
User Defined Commercial	461.97	461.97	461.97	928,172	928,172
User Defined Recreational	1,124.84	1,124.84	1124.84	2,259,990	2,259,990
Total	5,853.81	5,853.81	5,853.81	8,440,312	8,440,312

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
Convenience Market With Gas	14.70	6.60	6.60	0.80	80.20	19.00	14	21	65
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Hotel	14.70	6.60	6.60	19.40	61.60	19.00	58	38	4
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
Unenclosed Parking with	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
User Defined Commercial	14.70	6.60	6.60	19.40	61.60	19.00	58	38	4
User Defined Recreational	14.70	6.60	6.60	19.40	61.60	19.00	58	38	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Convenience Market With Gas Pumps	0.516284	0.026651	0.153383	0.099383	0.013704	0.003843	0.011085	0.165761	0.001657	0.001520	0.005298	0.000873	0.000557
General Light Industry	0.516284	0.026651	0.153383	0.099383	0.013704	0.003843	0.011085	0.165761	0.001657	0.001520	0.005298	0.000873	0.000557
Hotel	0.516284	0.026651	0.153383	0.099383	0.013704	0.003843	0.011085	0.165761	0.001657	0.001520	0.005298	0.000873	0.000557
Parking Lot	0.516284	0.026651	0.153383	0.099383	0.013704	0.003843	0.011085	0.165761	0.001657	0.001520	0.005298	0.000873	0.000557
Unenclosed Parking with Elevator	0.516284	0.026651	0.153383	0.099383	0.013704	0.003843	0.011085	0.165761	0.001657	0.001520	0.005298	0.000873	0.000557
User Defined Commercial	0.516284	0.026651	0.153383	0.099383	0.013704	0.003843	0.011085	0.165761	0.001657	0.001520	0.005298	0.000873	0.000557
User Defined Recreational	0.516284	0.026651	0.153383	0.099383	0.013704	0.003843	0.011085	0.165761	0.001657	0.001520	0.005298	0.000873	0.000557

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Tachi Palace EE - Kings County, Annual

	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	916.8161	916.8161	0.0415	8.5800e-003	920.4085
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	983.0829	983.0829	0.0445	9.2000e-003	986.9350
NaturalGas Mitigated	0.0378	0.3434	0.2885	2.0600e-003		0.0261	0.0261		0.0261	0.0261	0.0000	373.8215	373.8215	7.1600e-003	6.8500e-003	376.0429
NaturalGas Unmitigated	0.0378	0.3434	0.2885	2.0600e-003		0.0261	0.0261		0.0261	0.0261	0.0000	373.8215	373.8215	7.1600e-003	6.8500e-003	376.0429

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					
Convenience Market With Gas Pumps	64200	3.5000e-004	3.1500e-003	2.6400e-003	2.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	3.4260	3.4260	7.0000e-005	6.0000e-005	3.4463
General Light Industry	2.087e+006	0.0113	0.1023	0.0859	6.1000e-004		7.7800e-003	7.7800e-003		7.7800e-003	7.7800e-003	0.0000	111.3703	111.3703	2.1300e-003	2.0400e-003	112.0321
Hotel	3.521e+006	0.0190	0.1726	0.1450	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	187.8940	187.8940	3.6000e-003	3.4400e-003	189.0105
Parking Lot	0	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
Unenclosed Parking with Elevator	0	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
User Defined Commercial	1.11711e+006	6.0200e-003	0.0548	0.0460	3.3000e-004		4.1600e-003	4.1600e-003		4.1600e-003	4.1600e-003	0.0000	59.6134	59.6134	1.1400e-003	1.0900e-003	59.9676
User Defined Recreational	215837	1.1600e-003	0.0106	8.8900e-003	6.0000e-005		8.0000e-004	8.0000e-004		8.0000e-004	8.0000e-004	0.0000	11.5179	11.5179	2.2000e-004	2.1000e-004	11.5864
Total		**0.0378**	**0.3434**	**0.2885**	**2.0600e-003**		**0.0261**	**0.0261**		**0.0261**	**0.0261**	**0.0000**	**373.8215**	**373.8215**	**7.1600e-003**	**6.8400e-003**	**376.0429**

5.2 Energy by Land Use - NaturalGas

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					
Convenience Market With Gas Pumps	64200	3.5000e-004	3.1500e-003	2.6400e-003	2.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	3.4260	3.4260	7.0000e-005	6.0000e-005	3.4463
General Light Industry	2.087e+006	0.0113	0.1023	0.0859	6.1000e-004		7.7800e-003	7.7800e-003		7.7800e-003	7.7800e-003	0.0000	111.3703	111.3703	2.1300e-003	2.0400e-003	112.0321
Hotel	3.521e+006	0.0190	0.1726	0.1450	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	187.8940	187.8940	3.6000e-003	3.4400e-003	189.0105
Parking Lot	0	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
Unenclosed Parking with Elevator	0	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
User Defined Commercial	1.11711e+006	6.0200e-003	0.0548	0.0460	3.3000e-004		4.1600e-003	4.1600e-003		4.1600e-003	4.1600e-003	0.0000	59.6134	59.6134	1.1400e-003	1.0900e-003	59.9676
User Defined Recreational	215837	1.1600e-003	0.0106	8.8900e-003	6.0000e-005		8.0000e-004	8.0000e-004		8.0000e-004	8.0000e-004	0.0000	11.5179	11.5179	2.2000e-004	2.1000e-004	11.5864
Total		**0.0378**	**0.3434**	**0.2885**	**2.0600e-003**		**0.0261**	**0.0261**		**0.0261**	**0.0261**	**0.0000**	**373.8215**	**373.8215**	**7.1600e-003**	**6.8400e-003**	**376.0429**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market With Gas Pumps	48900	14.2256	6.4000e-004	1.3000e-004	14.2813
General Light Industry	882000	256.5839	0.0116	2.4000e-003	257.5893
Hotel	1.1116e+006	323.3772	0.0146	3.0300e-003	324.6443
Parking Lot	140000	40.7276	1.8400e-003	3.8000e-004	40.8872
Unenclosed Parking with Elevator	776000	225.7473	0.0102	2.1100e-003	226.6318
User Defined Commercial	352679	102.5983	4.6400e-003	9.6000e-004	103.0004
User Defined Recreational	68141.1	19.8230	9.0000e-004	1.9000e-004	19.9007
Total		**983.0829**	**0.0445**	**9.2000e-003**	**986.9349**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Convenience Market With Gas Pumps	45338.4	13.1895	6.0000e-004	1.2000e-004	13.2411
General Light Industry	838800	244.0165	0.0110	2.2800e-003	244.9727
Hotel	1.07778e+006	313.5374	0.0142	2.9300e-003	314.7659
Parking Lot	117600	34.2112	1.5500e-003	3.2000e-004	34.3452
Unenclosed Parking with Elevator	664000	193.1652	8.7300e-003	1.8100e-003	193.9221
User Defined Commercial	341948	99.4765	4.5000e-003	9.3000e-004	99.8662
User Defined Recreational	66067.7	19.2198	8.7000e-004	1.8000e-004	19.2952
Total		**916.8161**	**0.0415**	**8.5700e-003**	**920.4085**

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	1.4460	2.0000e-004	0.0216	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0422	0.0422	1.1000e-004	0.0000	0.0449
Unmitigated	1.4460	2.0000e-004	0.0216	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0422	0.0422	1.1000e-004	0.0000	0.0449

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	0.2246					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2195					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.9900e-003	2.0000e-004	0.0216	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0422	0.0422	1.1000e-004	0.0000	0.0449
Total	**1.4460**	**2.0000e-004**	**0.0216**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0422**	**0.0422**	**1.1000e-004**	**0.0000**	**0.0449**

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	0.2246					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2195					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.9900e-003	2.0000e-004	0.0216	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.0422	0.0422	1.1000e-004	0.0000	0.0449
Total	**1.4460**	**2.0000e-004**	**0.0216**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0422**	**0.0422**	**1.1000e-004**	**0.0000**	**0.0449**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	60.6916	1.0135	0.0244	93.2850
Unmitigated	75.3648	1.2668	0.0304	116.1045

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market With Gas Pumps	0.444435 / 0.272396	1.1179	0.0145	3.5000e-004	1.5857
General Light Industry	23.125 / 0	43.7381	0.7552	0.0181	68.0211
Hotel	5.07335 / 0.563706	10.1696	0.1657	3.9800e-003	15.4992
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	5.07335 / 0.563706	10.1696	0.1657	3.9800e-003	15.4992
User Defined Recreational	5.07335 / 0.563706	10.1696	0.1657	3.9800e-003	15.4992
Total		**75.3648**	**1.2668**	**0.0304**	**116.1045**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Convenience Market With Gas Pumps	0.355548 / 0.272396	0.9498	0.0116	2.8000e-004	1.3243
General Light Industry	18.5 / 0	34.9905	0.6041	0.0145	54.4168
Hotel	4.05868 / 0.563706	8.2505	0.1326	3.1900e-003	12.5146
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	4.05868 / 0.563706	8.2505	0.1326	3.1900e-003	12.5146
User Defined Recreational	4.05868 / 0.563706	8.2505	0.1326	3.1900e-003	12.5146
Total		**60.6917**	**1.0135**	**0.0244**	**93.2850**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	47.7567	2.8223	0.0000	118.3151
Unmitigated	95.5133	5.6447	0.0000	236.6303

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Convenience Market With Gas Pumps	18.03	3.6599	0.2163	0.0000	9.0673
General Light Industry	124	25.1709	1.4876	0.0000	62.3598
Hotel	109.5	22.2275	1.3136	0.0000	55.0677
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	109.5	22.2275	1.3136	0.0000	55.0677
User Defined Recreational	109.5	22.2275	1.3136	0.0000	55.0677
Total		**95.5133**	**5.6447**	**0.0000**	**236.6303**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Convenience Market With Gas Pumps	9.015	1.8300	0.1082	0.0000	4.5337
General Light Industry	62	12.5854	0.7438	0.0000	31.1799
Hotel	54.75	11.1138	0.6568	0.0000	27.5339
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	54.75	11.1138	0.6568	0.0000	27.5339
User Defined Recreational	54.75	11.1138	0.6568	0.0000	27.5339
Total		**47.7567**	**2.8223**	**0.0000**	**118.3151**

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
Emergency Generator	1	0	30	2923	0.73	CNG

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
Boiler	2	0	8760	0.5	CNG

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/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
Equipment Type	tons/yr										MT/yr					
Boiler - CNG (0 - 2 MMBTU)	0.0472	0.2102	0.8417	5.1500e-003		0.0653	0.0653		0.0653	0.0653	0.0000	934.9499	934.9499	0.0179	0.0000	935.3979
Emergency Generator - CNG (500 - 9999 HP)	0.3858	0.0297	1.0047	1.3000e-004		2.1300e-003	2.1300e-003		2.1300e-003	2.1300e-003	0.0000	22.3582	22.3582	0.0468	0.0000	23.5269
Total	**0.4330**	**0.2400**	**1.8463**	**5.2800e-003**		**0.0674**	**0.0674**		**0.0674**	**0.0674**	**0.0000**	**957.3081**	**957.3081**	**0.0647**	**0.0000**	**958.9248**

11.0 Vegetation

APPENDIX D

NOISE MONITORING RESULTS

Tachi Palace Casino Resort Expansion Project
Noise Monitoring Site A

Information Panel

Name:
Study 1

Parent Session:
S206

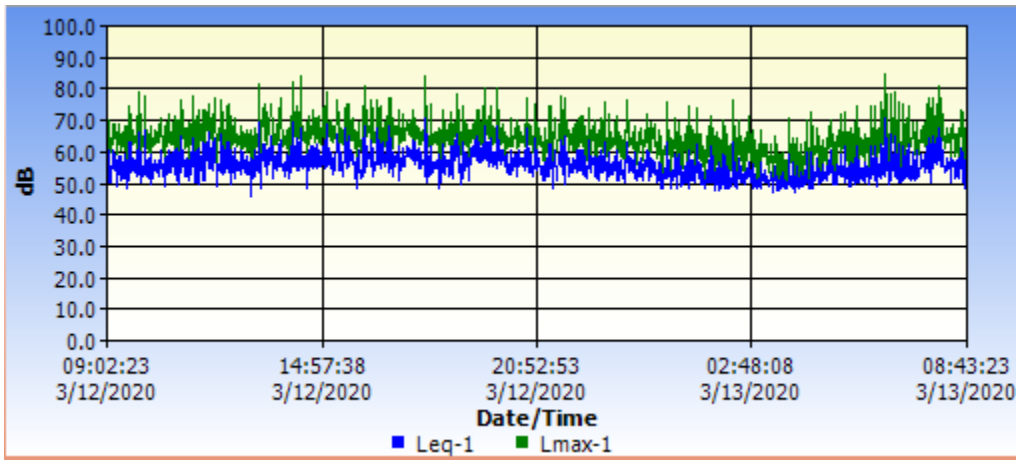
Start Time:
Thursday, March 12, 2020 09:01:23

Stop Time:
Friday, March 13, 2020 08:44:13

Data Panel

Description	Meter/Sensor	Value
Weighting	1	A
Bandwidth	1	OFF
Response	1	SLOW
Criterion Time	1	8 hrs.
Leq	1	57.5 dB
CNEL	1	62.7 dB
LDN	1	62.2 dB
SEL	1	106.8 dB
Lmax	1	84.7 dB

Logged Data Chart



Tachi Palace Casino Resort Expansion Project
Noise Monitoring Site B

Information Panel

Name:
Study 1

Parent Session:
S313

Start Time:
Wednesday, March 11, 2020 08:37:55

Stop Time:
Thursday, March 12, 2020 08:49:55

Data Panel

Description	Meter/Sensor	Value
Weighting	1	A
Bandwidth	1	OFF
Response	1	FAST
Criterion Time	1	8 hrs.
Leq	1	61.8 dB
CNEL	1	66.8 dB
LDN	1	66.5 dB
SEL	1	111.2 dB
Lmax	1	101.1 dB

Logged Data Chart

