APPENDICES

APPENDIX 1	SUMMARY OF STAKEHOLDER OUTREACH
APPENDIX 2	POLICY BRIEF
APPENDIX 3A	TRANSPORTATION IMPACT ANALYSIS
APPENDIX 3B	TIA SUPPLEMENTAL MEMO
APPENDIX 4	PROPERTY SURVEY
APPENDIX 5	NATURAL RESOURCES RECONNAISANCE
APPENDIX 6	STORMWATER CREDIT FEASIBILITY STUDY
APPENDIX 7	PATIENT RELEASE PROCEDURES
APPENDIX 8	SEPA CHECKLIST

Appendix 1: Stakeholder Meetings

MEETING SUMMARIES

HISTORIC FORT STEILACOOM

The WSH planning team met with the Historic Fort Steilacoom Association (HFSA) on August 20, 2019 to discuss the draft campus plan. The HFSA confirmed that Buildings 40-43 are associated with the Fort's historic period. They also noted that there is a small replica structure near Building 44, representing a munitions storage building from the Fort era.

They requested that the following be considered or addressed in the campus plan:

- HFSA leadership would prefer that the stone wall south of the Fort parade ground be removed - as it dates from the Hospital era - and be replaced with a fence of the style from the Fort era.
- They also would prefer that the line of trees along Steilacoom Boulevard be removed, as they also post-date the Fort era.
- Unmanageable parking in the parade grounds area is a significant problem for the Fort and visitor experience.
- The HFSA would like to see the east-west road and parking eliminated from the area within the crescent of the existing cottages removed, both to address the concern above and to allow for historic reenactments on the parade grounds.
- HFSA has developed an early vision for a visitor center along the southeastern edge of the parade grounds, of approximately 3,000 SF
- The Association also is evaluating a plan to demarcate the location/ footprint of former Fort structures, in the ground plane.

TOWN OF STEILACOOM

The Town Council of Steilacoom was briefed at a regular public meeting on March 3, 2020.

ADDITIONAL MEETINGS TO BE HELD

SCHOOL DISTRICT(S)

This meeting is in the process of being scheduled.

PIERCE COLLEGE - Fort Steilacoom

This meeting is in the process of being scheduled.

NEIGHBORHOOD ASSOCIATIONS:

- Central Lakes (LD O5)
  This meeting is in the process of being scheduled.
- North Lakewood (LD 06)
  This meeting is in the process of being scheduled.

7 MAY 2021

Appendix 2: Policy Brief - Transforming Washington's Behavioral Health Care System

This policy publication describes the transformation of Washington's Health Care System that underlies the reinvestment in Western State Hospital, as well as other facilities throughout the state.

Washington State Department of Social and Health Services

Community-Based Treatment

Transforming Lives

Governor Inslee's Five-Year Plan and Vision to Transform Washington's Behavioral Health Systems

"We are trying to provide 21st century medical care using a 19th century model of care. Large institutions were popular in 1918, but in 2018, we know smaller hospitals closer to home are far more effective for patients. Through a combination of mostly state-run options, we will be able to serve nearly all our civil patients in smaller facilities that are much closer to home and much more able to sustain the kind of supports that ensure patients get the right care at the right time."- Gov. Jay Inslee (Policy Brief. December 2018. https://ofm.wa.gov/sites/default/files/public/budget/statebudget/highlights/budget19/Behavioral_Health_policyBrief_0.pdf)

Supporting the Governor's Vision

Two years ago, Governor Inslee laid out his vision to provide services in local communities for people with acute mental illness. Serving people in their home communities is essential to this plan. To do this, this transformation requires development of a continuum of services that can prevent or divert people from being committed to the state hospitals and can support people in their recovery after treatment in a hospital is complete.

The interest by Governor Inslee and the Legislature is spurred by Washington's rank of 47th in the nation in capacity for appropriate mental health services. Compared to the rest of the country, Washington has a high prevalence of mental illness and low access to care. Within two years, the state will need almost 370 more civil beds than our current capacity.

The state is at the beginning of a major reform of the entire mental health service delivery model. Other state agencies and the University of Washington also have been funded and charged with the responsibility to increase the number of psychiatric services in our communities, as well as support services such as housing.

DSHS' Commitment to Community-Based Treatment

The Legislature supported Governor Inslee's concept and, in the 2019 Session, enacted a budget and provided direction to the **Department of Social and Health Services to begin development of three small community-based/behavioral health residential treatment facilities.**

These facilities would provide a range of services to people as they move through the treatment regimen: evaluation and treatment, 90-day to 180-day intensive treatment, and a step-down program to ready people for their return to home and work. The department is required to submit to the Legislature a "preliminary predesign" of these facilities by December 31, 2019.

The department is at the early stages of this development process. We have several geographic areas that we are researching to determine suitability based on access to a qualified staff pool; existence of other community services and supports; availability of land and utilities and; suitability for neighboring homes, businesses, and industries.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Washington State Department of Social and Health Services

Transforming Lives

Civil and Forensic Bed Capacity Investments

Capacity Investments

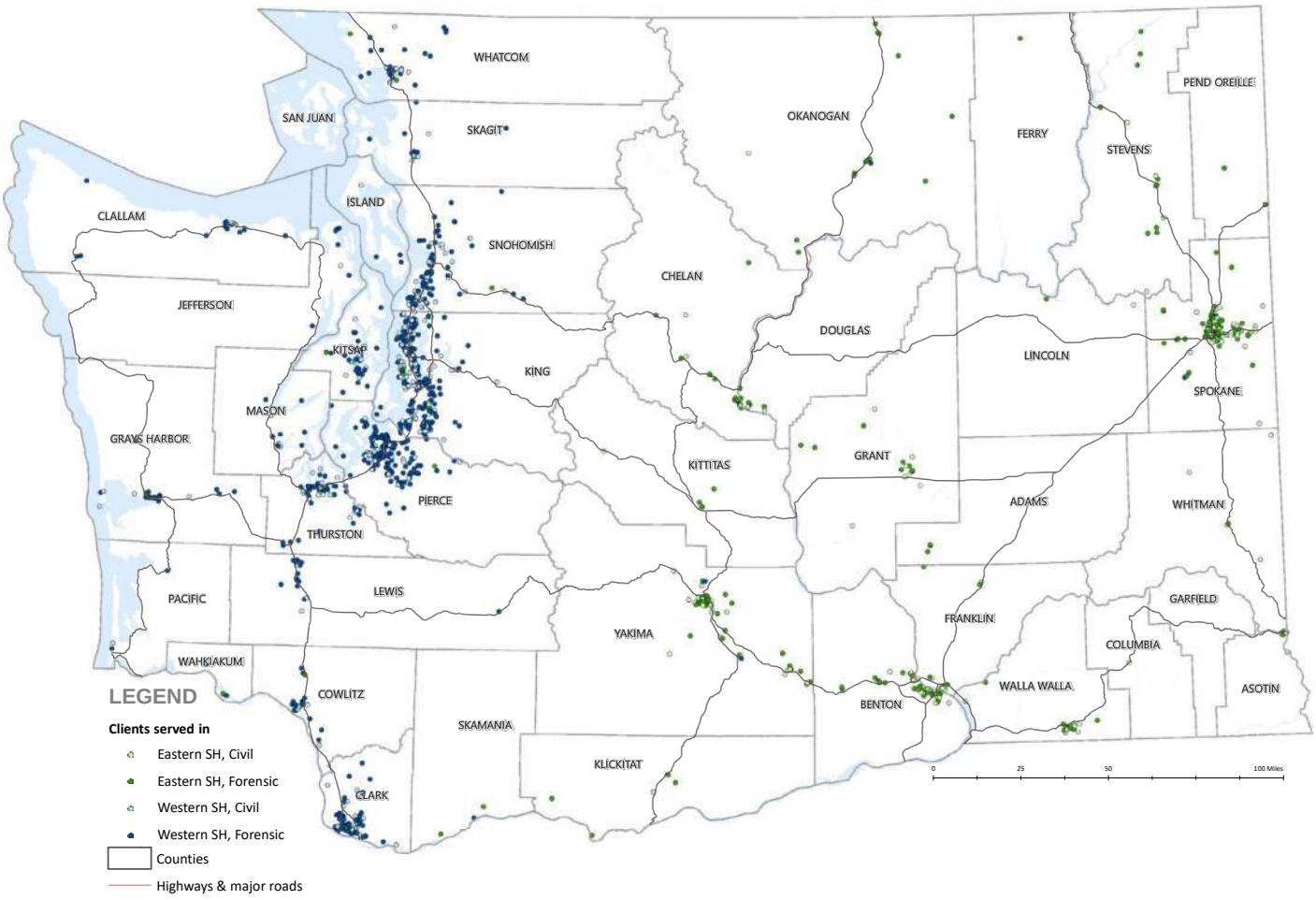
Forensic	Date Online	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27
WSH Forensic	current	330								
WSH Forensic (Building 27)	8/19/2019		30							
WSH Forensic (2 Ward-Gero to Forensic swap E3&E4)	6/1/2020		42							
WSH 2 Ward Addition (30002765)	4/1/2021				30		30			
WSH - Forensic Beds (TBD beds off-line *)			Estimate not available at this time							
New Forensic Center (40000385: up to 350 bed hospital)									350	
ESH Forensic	current	125								
ESH Forensic (Wards 1N 3)	5/1/2020		25							
ESH Forensic (Wards 3N 3)	6/1/2020		25							
Yakima closes no later than 12/31/21 (settlement)	current	24			(24)					
Maple Lane closes no later than 7/1/24 (settlement)	current	30						(30)		
Subtotal		509	122	-	6	-	30	(30)	350	-
Total Forensic Beds		**509**	**631**	**631**	**637**	**637**	**667**	**637**	**987**	**987**

Civil	Date Online	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27
ESH Civil	current	192								
WSH Civil	current	527								
WSH Forensic (2 Ward-Gero to Forensic swap E3&E4)	8/19/2019 offline		(60)							
ESH/WSH Civil beds (TBD beds off-line *)			Estimate not available at this time							
(91000075) 16 Bed Civil BH Community Facilities						16				
(91000074) 48 Bed Civil BH Community Facilities (1 of 2) - 90/180						16				
(91000077) 48 Bed Civil BH Community Facilities (2 of 2) - 90/180							16			
48 Bed Civil BH Community Facilities (1 of 2) - 90/180						16				
48 Bed Civil BH Community Facilities (2 of 2) - 90/180							16			
48 Bed Civil BH Community Facilities (1 of 2) - E&T/Step Down						16				
48 Bed Civil BH Community Facilities (2 of 2) - E&T/Step Down							16			
Aging and Long-Term Support Administration - AFH, AL, ARC, NH		56	39	37						
Aging and Long-Term Support Administration - Non-Citizen			5	5						
Aging and Long-Term Support Administration - ESF		62	46	48						
Aging and Long-Term Support Administration - Supportive Housing		58	30	30						
Aging and Long-Term Support Administration - Specialized Dementia			50	50						
Developmental Disabilities Administration - SOLA Investments***		17	11	13						
Developmental Disabilities Administration - Group Training Homes	7/1/2021				6					
Health Care Authority - Freestanding E&T Facilities/Certified E&T Beds		905								
Health Care Authority - Community 90/180 Beds			71	48						
Health Care Authority - Intensive BH Treatment Facilities			16	32						
Health Care Authority - Mental Health Drop-In Facilities				18						
Commerce Capital for MultiCare (HCA)	1/1/2024 (?)						136			
UW Teaching Hospital (150 beds)	1/1/2024						150			
Subtotal		1,817	208	281	6	64	334	-	-	-
Total Civil Beds		**1,817**	**2,025**	**2,306**	**2,312**	**2,376**	**2,710**	**2,710**	**2,710**	**2,710**
Total Capacity Beds		**2,326**	**2,656**	**2,937**	**2,949**	**3,013**	**3,377**	**3,347**	**3,697**	**3,697**

*** FY19 17 DDA beds funded by the 2017-19 Mental Health Initiative. FY20 and FY21 total reflect clients placed, not beds. Clients are phased in.
*Total number of beds taken off-line will need to be estimated at a later date.
Table above summarizes current and future bed capacity funded through FY21 (Operating Budget), with funded capital project listed through FY27.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Persons Served at State Hospitals, CY 2018



CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Washington State Department of Social and Health Services

Potential Use Scenario

Transforming Lives

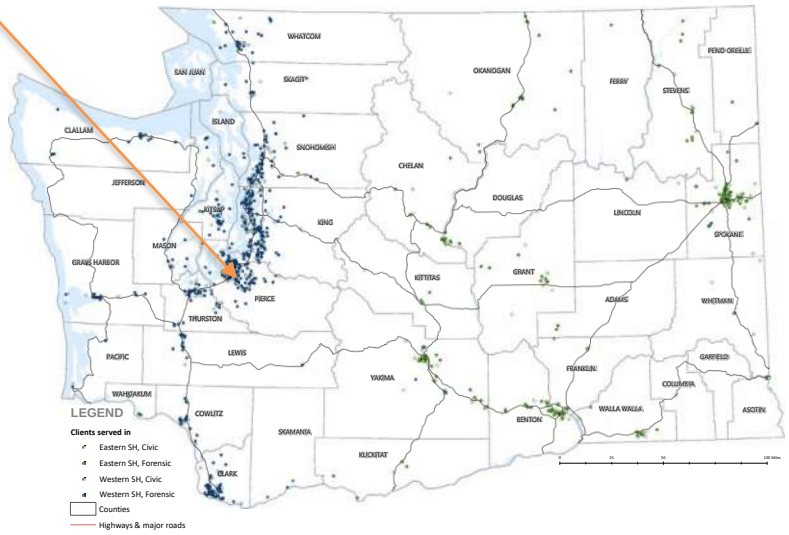
New State Hospitals at Western State Hospital Central Campus

(Legislative District 28)

Western State Hospital, Central Campus, Lakewood, WA
250 - 350 Bed Forensic Hospital
16 - 48 Civil Commitment State-Owned Facility

Western State Hospital, Bldg. 28

Western State Hospital in Lakewood, WA is a state-owned campus of 215 acres. The Governor's 2019-21 biennial budget proposed evolving the state psychiatric hospitals into Forensic Centers of Excellence and closing the hospitals to civil commitment admissions by the end of 2023. The 2019-21 Enacted Budget supported his vision and provided funding for predesign of a 250-350 new forensic hospital at WSH. Development of community placements also is required in order to move civilly committed people out of WSH.



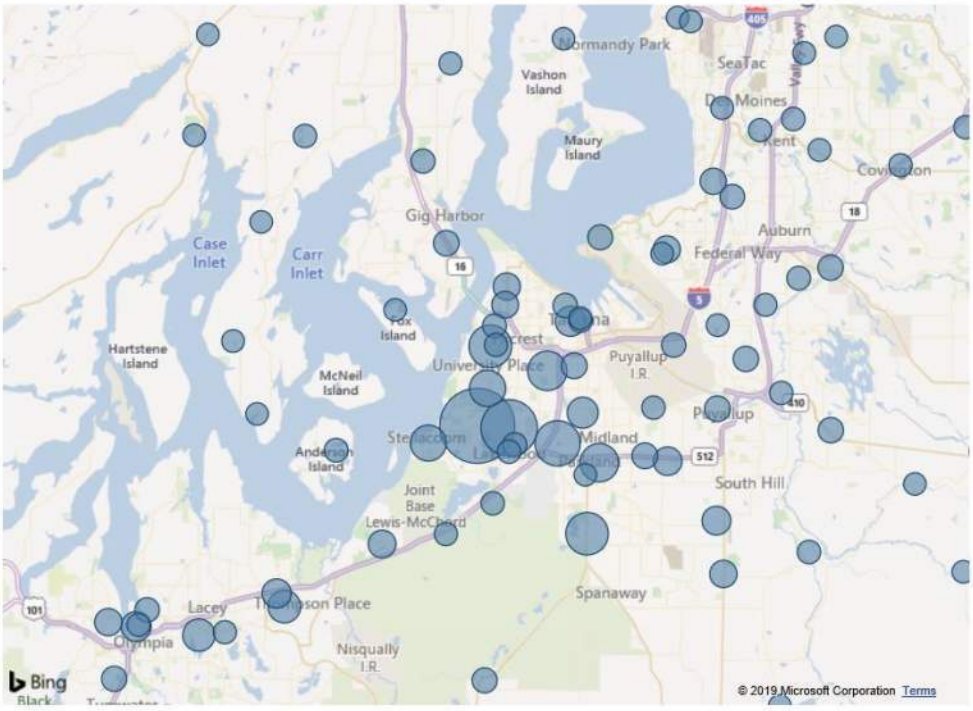
With some renovations, a 48-bed facility for other civil capacity could be housed in the existing Building 28, which is part of the current Center for Forensic Services (CFS). This building currently houses eight 30-bed wards and was built in 2001. This smaller facility could share services such as kitchen and laundry with the forensic hospital.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Pros & Cons for Western State Hospital Location

Pros	Cons
• Forensic/Civil zoning for central campus • Already zoned – quicker startup • Site already owned by state • Centrally located in Western WA along I-5 corridor • New kitchen that can be used for new hospitals • Existing staff – concentration of expertise, opportunity to realign staff with services • Planning underway to move civil patients to other facilities • Less impact to existing forensic patients • Longtime community presence • Possibility of using Lakewood water	• Significant building demolition required • Relocate or design around cemetery • Civil patient census will need to be decreased before demolition and construction. This is in the infancy stages • Spaghetti of utilities that will need to be addressed • Building 27 is in the way until at least 2022 • Underground surprises (dumps, foundations, archeological significance) • Closer to Steilacoom High School

Economic Impact of Western State Hospital Campus

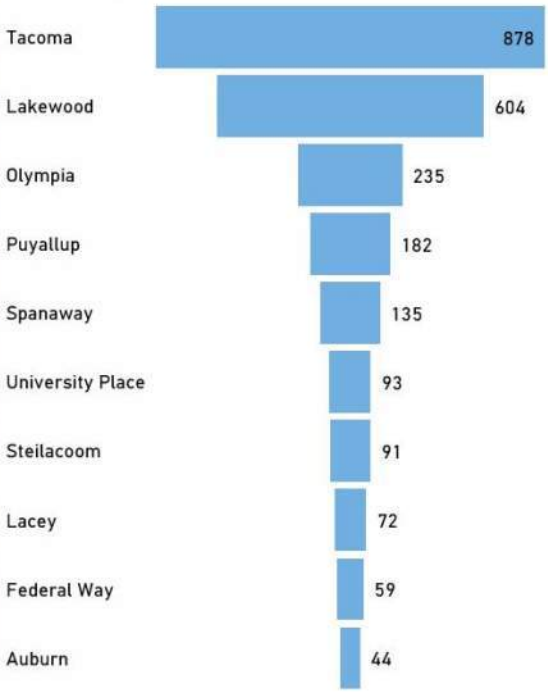


Source: DSHS Data Generated by HRD on 08/06/2019

Total Staff

2819

Top Cities Where Staff Live



CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Washington State Department of Social and Health Services

Transforming Lives

Potential Use Scenario

Fircrest School Campus

(Legislative District 32)

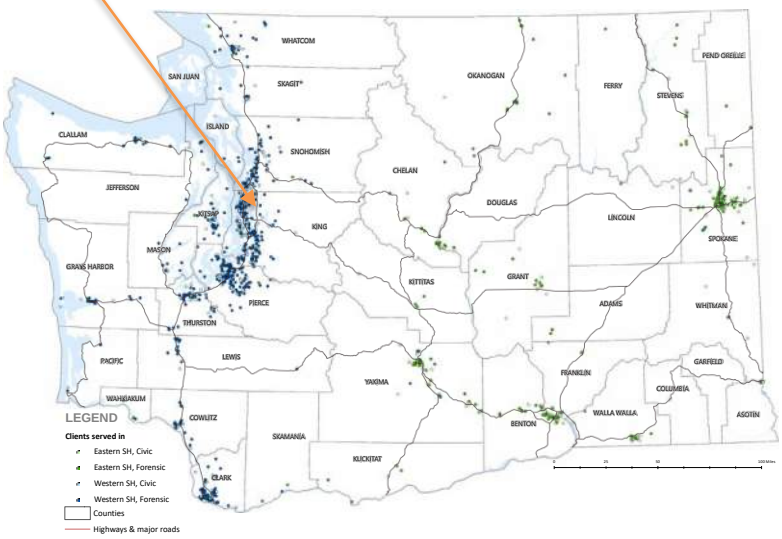
48-Bed State Owned, Mixed Use Community Civil Capacity located at Fircrest Campus, north of Seattle, WA

Fircrest School Campus.

The Governor's 2019-21 Biennial Budget proposed major investments to transform the way state-owned, state-operated civil commitments are served.

The Legislature supported Governor Inslee's concept and, in the 2019 Session, enacted a budget and provided direction to the Department of Social and Health Services to begin development of three small community-based/behavioral health residential treatment facilities.

Fircrest School Campus is state-owned. It is in Shoreline, just north of Seattle. There are two plots that might be suitable for a 48-bed facility at the south end of the campus.



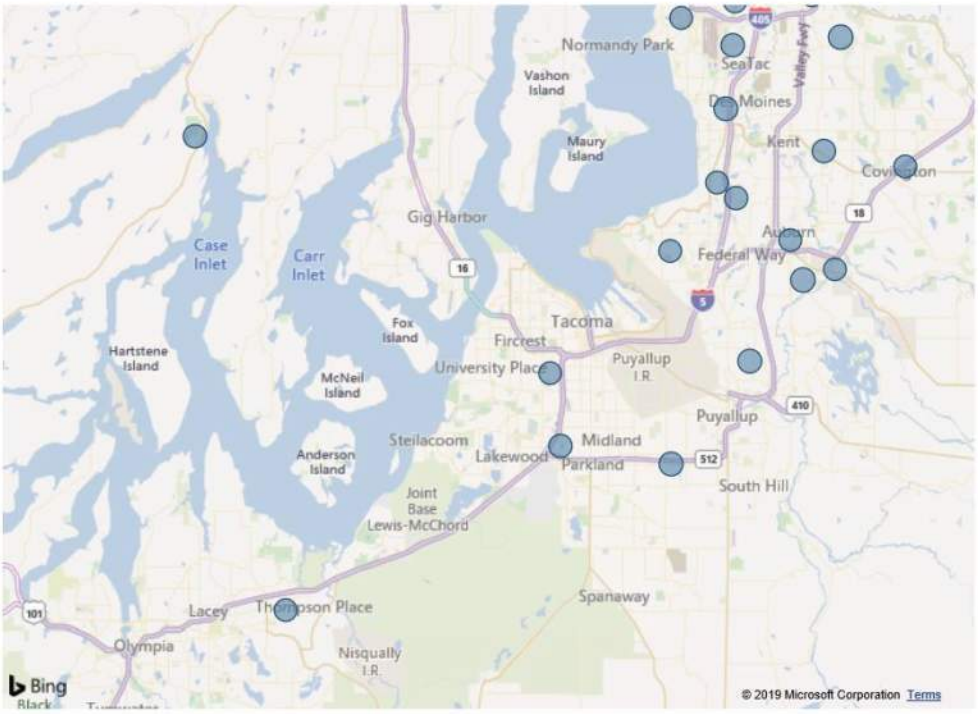
In addition to the site being state-owned, another advantage is the proximity to the UW medical school and to Seattle's medical industry. A disadvantage is the relatively small developable area as well as intense interest in the campus from other public and private parties.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Pros & Cons for Fircrest School Location

Pros	Cons
• Availability of professional staff • Close to WSH patients • Close to I-5 • Relationship with UW Medical School • Campus support from Fircrest (maintenance, laundry, etc.)	• Small, narrow parcels of land • Maybe 16 to 48 bed facilities • Premium pay for professional staff • Close to park and high school • Re-zone property

Economic Impact of Fircrest School

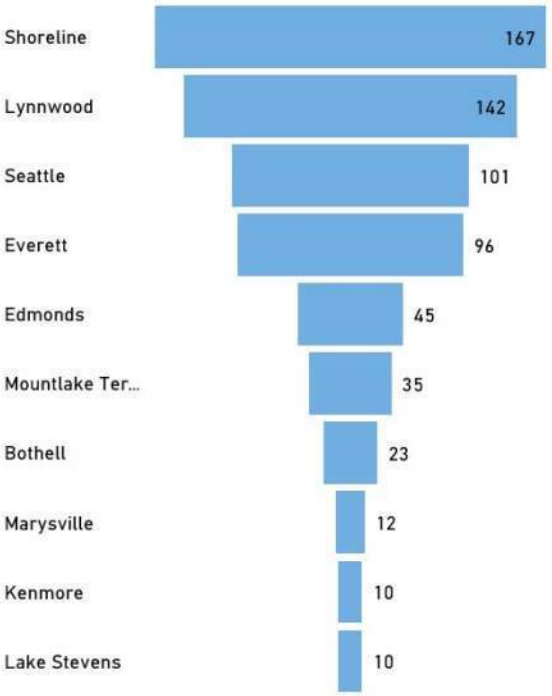


Source: DSHS Data Generated by HRD on 08/06/2019

Total Staff

727

Top Cities Where Staff Live



CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Washington State Department of Social and Health Services

Transforming Lives

Potential Use Scenario

Echo Glen Children's Center Campus

(Legislative District 5)

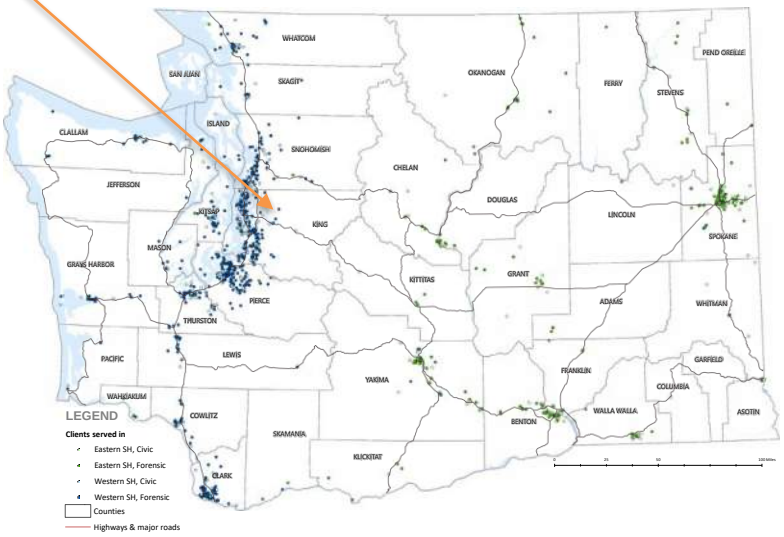
16-Bed or 48-Bed State Owned Community Civil Facility located at EGCC, Snoqualmie, WA

Echo Glen Children's Center Campus including surrounding DNR land

The Governor's 2019-21 Biennial Budget proposed major investments to transform the way state-owned, state-operated civil commitments are served.

The Legislature supported Governor Inslee's concept and, in the 2019 Session, enacted a budget and provided direction to the Department of Social and Health Services to begin development of three small community-based/behavioral health residential treatment facilities.

Echo Glen Children's Center campus is a state-owned site that is located in Snoqualmie, WA. It is approximately 25 miles east of Seattle and is adjacent to I-90.



In addition to the site being state-owned, another advantage is the existing relationship between the UW medical school and the Juvenile Rehabilitation program at EGCC. This relationship could be expanded for a civil psychiatric hospital. The site is also close to the medical industry in Seattle. A disadvantage might be the hilly topography. The site likely would require utilities, roads, and grading work be done.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Pros & Cons for Echo Glen Children's Center Location

Pros	Cons
• Lots of land around Echo Glen • Close to Seattle and Bellevue • Convenient access to I-90 and I-5 • CERPI undeveloped lands • Relationship with UW Medical School already established • Cost of living relatively low, could help draw staff to the area • Close to 25-bed community hospital • Close to medical services in Issaquah	• Difficult to access site – one way in and one way out • Much of the area is wetlands • Lack of utilities • Topography contains hills and swamps • Zoning may be an issue • More inclement weather since it is closer to mountains

Location Selection Criteria

The following criteria were used when considering locations.

Location and Proposed Configuration		Dr. & Staff Availability	Current Site Conditions	Time to Completion	Local Political Considerations	Local Prof. Partnerships
Western State Hospital	250 - 350 Forensic Beds 48 Civil beds (bldg. 28)	↑	↑	→	↑	→
Fircrest School Campus	48 Civil Beds	↑	→	→	↓	↑
Arlington	16 - 48 Civil Beds	→	↓	→	→	→
Clark County	16 - 48 Civil Beds	↑	↓	↑	→	↑
Echo Glen	16 - 48 Civil Beds	↑	→	→	↑	↑
Maple Lane	16 - 48 Civil Beds	↓	→	→	→	↓

Doctor and Staff Availability proximity to major freeways and metropolitan areas where doctors and staff reside.
Current Site Conditions could include ownership of the site, availability of utilities and other support services.
Time to Completion includes time for zoning, community meetings, site preparation, construction, etc.
Local Political Considerations include zoning, community involvement
Local Professional Partnerships the possibility of forming a partnership with major university mental health program.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Washington State Department of Social and Health Services

Transforming Lives

Potential Use Scenario

Arlington, WA

(Legislative District 39)

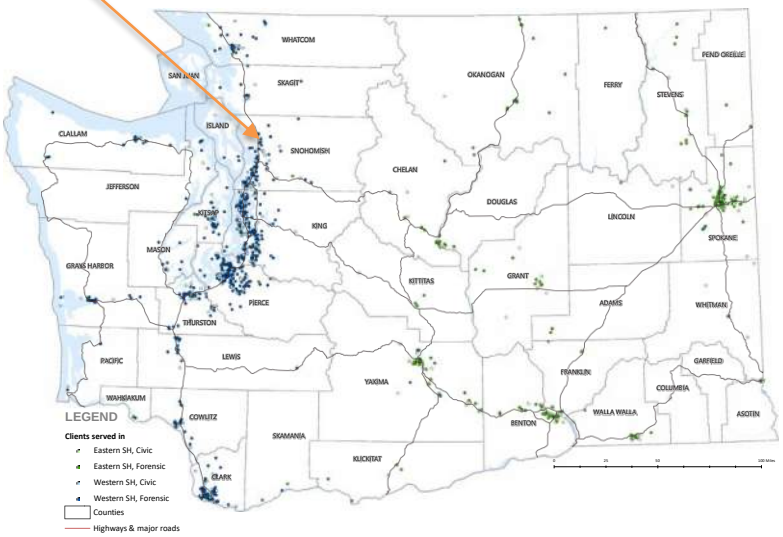
16-Bed or 48-Bed State Owned Community Civil Facility located in Arlington, WA

Arlington area. Parcel outlined in T-shape configuration is approximately 260 acres.

The Governor's 2019-21 Biennial Budget proposed major investments to transform the way state-owned, state-operated civil commitments are served.

The Legislature supported Governor Inslee's concept and, in the 2019 Session, enacted a budget and provided direction to the Department of Social and Health Services to begin development of three small community-based/behavioral health residential treatment facilities.

Arlington is located approximately 20 miles north of Everett, off I-5 and is within proximity of medical services in Everett. Paine Field, newly opened to commercial flights, is also nearby.



CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Pros & Cons for Arlington WA Location

Pros	Cons
• Close to Everett and Marysville • Possible land partnership with WSDOT and Snohomish County PUD • Site is 260 acres of DNR land, of that 60-80 acres are available • Proximity to Everett Clinic • Close to Paine Field in Everett • City is already amenable to a new SCC SCTF facility	• Commute north may be difficult due to traffic • Do we need to build? Utilities, Roads, Water, Sewer? • Zoning may be an issue

Location Selection Criteria

The following criteria were used when considering locations.

↑ Advantage → Neutral ↓ Disavantage

Location and Proposed Configuration		Dr. & Staff Availability	Current Site Conditions	Time to Completion	Local Political Considerations	Local Prof. Partnerships
Western State Hospital	250 - 350 Forensic Beds 48 Civil beds (bldg. 28)	↑	↑	→	↑	→
Fircrest School Campus	48 Civil Beds	↑	→	→	↓	↑
Arlington	16 - 48 Civil Beds	→	↓	→	→	→
Clark County	16 - 48 Civil Beds	↑	↓	↑	→	↑
Echo Glen	16 - 48 Civil Beds	↑	→	→	↑	↑
Maple Lane	16 - 48 Civil Beds	↓	→	→	→	↓

Doctor and Staff Availability proximity to major freeways and metropolitan areas where doctors and staff reside.
Current Site Conditions could include ownership of the site, availability of utilities and other support services.
Time to Completion includes time for zoning, community meetings, site preparation, construction, etc.
Local Political Considerations include zoning, community involvement
Local Professional Partnerships the possibility of forming a partnership with major university mental health program.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Washington State Department of Social and Health Services

Transforming Lives

Potential Use Scenario

Clark County, WA

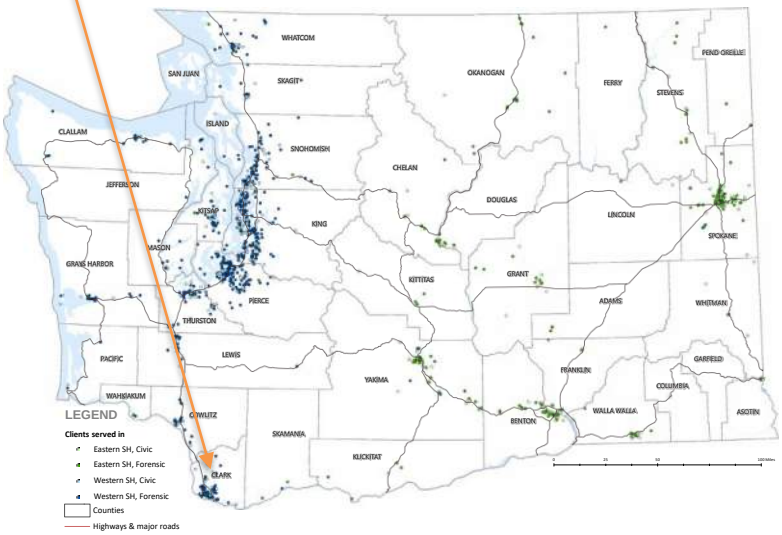
(Legislative Districts: 14, 17, 18, or 49)

16-Bed or 48-Bed State Owned Community Civil Facility located in Clark County, WA

Clark County. Red outlined areas are DNR land for possible location.

The Governor's 2019-21 Biennial Budget proposed major investments to transform the way state-owned, state-operated civil commitments are served.

The Legislature supported Governor Inslee's concept and, in the 2019 Session, enacted a budget and provided direction to the Department of Social and Health Services to begin development of three small community-based/behavioral health residential treatment Facilities.



Vancouver is one of the fastest growing areas in Washington. Its proximity to Portland Oregon's metro area and significant medical industry make it a good location for siting a civil facility.

Siting facilities on state-owned land could reduce the project development time by 12 months. This is because location selection, purchase, and zoning issues are avoided. Clark County, in southwest Washington, presents various state-owned potential sites for a 16-bed or 48-bed civil facility.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Pros & Cons for Clark County Location

Pros	Cons
• DNR land availability • Large parcels • Close to I-5 and I-205 • Close to Portland for staff	• Property prices are higher • Cost of living is increasing • No state presence in this area

Location Selection Criteria

The following criteria were used when considering locations.

Advantage Neutral Disavantage

Location and Proposed Configuration		Dr. & Staff Availability	Current Site Conditions	Time to Completion	Local Political Considerations	Local Prof. Partnerships
Western State Hospital	250 - 350 Forensic Beds 48 Civil beds (bldg. 28)	↑	↑	→	↑	→
Fircrest School Campus	48 Civil Beds	↑	→	→	↓	↑
Arlington	16 - 48 Civil Beds	→	↓	→	→	→
Clark County	16 - 48 Civil Beds	↑	↓	↑	→	↑
Echo Glen	16 - 48 Civil Beds	↑	→	→	↑	↑
Maple Lane	16 - 48 Civil Beds	↓	→	→	→	↓

Doctor and Staff Availability proximity to major freeways and metropolitan areas where doctors and staff reside.
Current Site Conditions could include ownership of the site, availability of utilities and other support services.
Time to Completion includes time for zoning, community meetings, site preparation, construction, etc.
Local Political Considerations include zoning, community involvement
Local Professional Partnerships the possibility of forming a partnership with major university mental health program.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Washington State Department of Social and Health Services

Transforming Lives

Potential Use Scenario

Maple Lane Campus
Centralia, WA

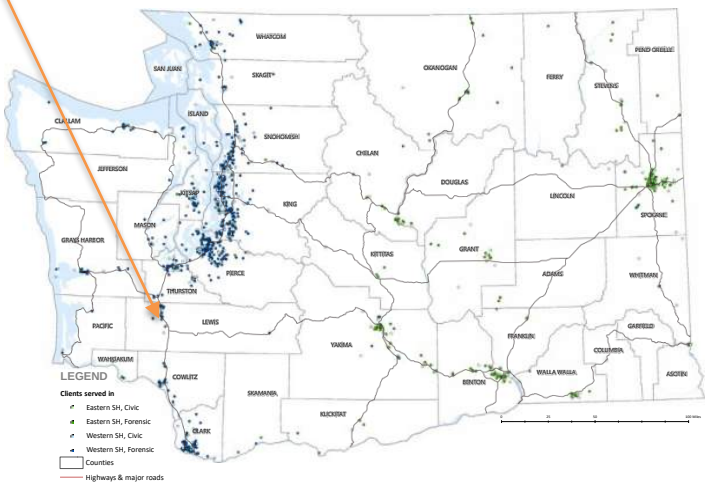
(Legislative District 20)

16 -Bed or 48-Bed State Owned Community Civil Facility located on the Maple Lane Campus, Centralia, WA

Maple Lane Campus, Centralia, WA

The Governor's 2019-21 Biennial Budget proposed major investments to transform the way state-owned, state-operated civil commitments are served.

The Legislature supported Governor Inslee's concept and, in the 2019 Session, enacted a budget and provided direction to the Department of Social and Health Services to begin development of three small community-based/behavioral health residential treatment facilities. Maple Lane Campus, in Centralia, Washington has been identified as a potential site.



Within minutes of the I-5 corridor, Maple Lane is located approximately 20 miles south of Olympia and 100 miles north of Portland.
The campus is currently used as a Competency Restoration facility in partnership with Wellpath.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Pros & Cons for Maple Lane Location

Pros	Cons
• Large parcels • Close to I-5 • Close to Olympia • Close to Portland • Property prices are lower	• No state presence in this area • No Maintenance and Administrative staff/support

Location Selection Criteria

The following criteria were used when considering locations.

↑ Advantage → Neutral ↓ Disavantage

Location and Proposed Configuration		Dr. & Staff Availability	Current Site Conditions	Time to Completion	Local Political Considerations	Local Prof. Partnerships
Western State Hospital	250 - 350 Forensic Beds 48 Civil beds (bldg. 28)	↑	↑	→	↑	→
Fircrest School Campus	48 Civil Beds	↑	→	→	↓	↑
Arlington	16 - 48 Civil Beds	→	↓	→	→	→
Clark County	16 - 48 Civil Beds	↑	↓	↑	→	↑
Echo Glen	16 - 48 Civil Beds	↑	→	→	↑	↑
Maple Lane	16 - 48 Civil Beds	↓	→	→	→	↓

Doctor and Staff Availability proximity to major freeways and metropolitan areas where doctors and staff reside.
Current Site Conditions could include ownership of the site, availability of utilities and other support services.
Time to Completion includes time for zoning, community meetings, site preparation, construction, etc.
Local Political Considerations include zoning, community involvement
Local Professional Partnerships the possibility of forming a partnership with major university mental health program.

CONTACTS: Judy Fitzgerald, 360.902.8174 judy.fitzgerald@dshs.wa.gov • Sean Murphy, 360.902-8155, sean.murphy@dshs.wa.gov
Prepared by DSHS Facilities, Finance, and Analytics Administration, Central Budget Office • September 2019

Appendix 3A: Transportation Impact Analysis

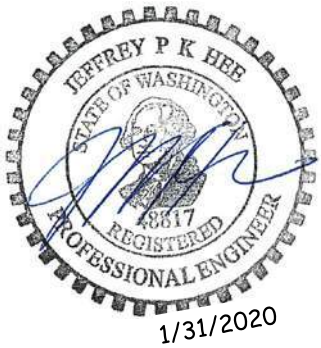
TSI
Transportation Solutions, Inc.
8250 - 165th Avenue NE
Suite 100
Redmond, WA 98052-6628
T 425-883-4134
F 425-867-0898
www.tsinw.com

Western State Hospital

Master Plan Update

Traffic Impact Analysis

January 31, 2020



Prepared for:

Western State Hospital,

SRG Partnership, Inc.

&

City of Lakewood

Table of Contents

List of Tables

List of Figures

Appendices

Abbreviations

DSHS	Departments of Social and Health Services
WSH	Western State Hospital
EIS	Environmental Impact Statement
CFS	Center for Forensic Services
Civil	Civil Commitment
CSTC	Child Study and Treatment Center
FHWA	Federal Highways Administration
WSDOT	Washington State Department of Transportation
MUTCD	Manual of Uniform Traffic Control Devices
HCM	Highway Capacity Manual
LOS	Level-of-Service
V/C	Volume-to-Capacity
Blvd.	Boulevard
Ave.	Avenue
St.	Street
Rd.	Road
Dr.	Drive
Pl.	Place
Ln.	Lane
Ct.	Court

Executive Summary

This Traffic Report summarizes the traffic impacts associated with an update of the Master Plan for WSH.

Over the next 10 years, the DSHS is proposing to reduce the overall number of patient beds at WSH. For the Master Plan, the number civil patient beds will reduce from 530 to 153, the number forensic patient beds will increase from 330 to 533, the number of CSTC patient beds will increase from 47 to 65, and a new 48 bed community hospital would be added to the campus.

The Master Plan proposes to vacate the South St. driveway off Sentinel Dr. SW and remove and relocate the existing CSTC Entrance driveway off Steilacoom Blvd. SW to a new location on Steilacoom Blvd. SW. Build-out of the Master Plan is intended to enhance access to the campus to and from Steilacoom Blvd. SW and to reduce traffic impacts on Sentinel Dr. SW and 87th Ave SW via Golf Course Rd. New traffic signals are also proposed at Chapel Gate Dr. and CSTC Entrance. Also, the existing signal at Circle Dr. is proposed to be removed and the intersection reconfigured.

Future traffic conditions were forecast for year 2030.

Proposed Action

The proposed changes are forecast to generate:

- 731 AM trips, between 6:30 and 7:30 AM, a 12% reduction from the campus' current trip generation.
- 603 AM trips, between 7:00 and 8:00 AM, an 11% reduction from the campus' current trip generation.
- 673 PM trips, between 2:15 and 3:15 PM, a 12% reduction from the campus' current trip generation.
- 325 PM trips, between 4:00 and 5:00 PM, a 12% reduction from the campus' current trip generation.
- 5,407 average weekday daily trips, a 12% reduction from the campus' current trip generation.

The technical analysis focuses on the AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak hour periods.

Level-of-Service/Operations

Currently, the CSTC Entrance driveway off Steilacoom Blvd. SW is computed to operate at LOS E (AM peak hour) and LOS F (PM peak hour) and outside of the City of Lakewood's LOS standards.

In the future No Action, the Chapel Gate Dr. and CSTC Entrance driveways off Steilacoom Blvd. SW are forecast to operate outside of the City of Lakewood's LOS standards:

- Chapel Gate Dr. LOS F (PM peak hour).
- CSTC Entrance. LOS F (AM and PM peak hours)

In the future with the Proposed Action, the Chapel Gate Dr. and CSTC Entrance driveways off Steilacoom Blvd. SW are forecast to operate similar to the No Action conditions.

When signalized, both driveways are forecast to operate at LOS B or better and the traffic conditions around the campus meet the City of Lakewood standards.

Circulation

Revised on-campus circulation patterns are not forecast to adversely impact traffic on the campus.

With the Proposed Action, a new forensic hospital would be built on the west side of the campus west of Chapel Gate Dr. This will shift more traffic to the Chapel Gate Dr. driveway.

Use of the central area of the campus will be reduced and less traffic is anticipated to use the Circle Dr. driveway.

The relocation of the CSTC Entrance off Steilacoom Blvd. SW allows for direct access to the new community hospital and expanded services at the CTSC and east WSH campus buildings. The new access location is also more midblock from Circle Dr. and 87th Ave SW, allowing for more spacing between the intersections.

The primary patient discharge route is anticipated to shift to the new CSTC Entrance. The primary service vehicles route is anticipated to be via Sentinel Dr. SW.

Safety

There were no existing safety deficiencies identified after review of the historical collision data. Improved access to the campus would reduce the potential safety risks with the revised traffic patterns on the campus.

Non-Motorized Impacts

On-campus pedestrian facilities will be upgraded to support campus activities.

The City of Lakewood and Town of Steilacoom are planning non-motorized improvements on Steilacoom Blvd. SW. The City of Lakewood's scope and timing for constructions of improvements on Steilacoom Blvd. SW including curb, gutter, sidewalk, sharrows, turn lanes, street lighting, drainage and overlay is undefined.

The Proposed Action is not forecast to change or adversely impact the current transit network.

Recommendations

The recommendations based on the Proposed Action are similar to those for the No Action.

- Circulation. Improve the campus's internal circulation by increasing the spacing between internal roadways and intersections and driveways.
- Access. Improve access to the campus by enhancing traffic flow to and from Steilacoom Blvd. SW via:
  - Install traffic control signals at Chapel Gate Dr. and at CSTC Entrance, with the intent to concentrate more traffic to these campus accesses and reduce traffic impacts on Sentinel Dr., 87th Ave. SW and Golf Course Rd. Traffic control signal installation requires certain "warrants" to be satisfied and these are discussed later in this document.
  - Widen Steilacoom Blvd. SW to provide left turn pockets and acceleration lanes to improve left turn maneuvers to and from the campus. Left turn lanes would enhance site access by providing a "pocket" off of the mainline for vehicles to queue in before making a left turn to the campus. Acceleration lanes, in the form of a center turn lane, would allow staged left turn maneuvers (left turn out of campus to turn lane to merge with opposing traffic volume). Widening requires right-of-way acquisition.
  - Remove the existing signal at Circle Drive and Steilacoom Blvd SW, and repurposing the intersection to be right-in and right-out only restricted. This will decentralize access at Circle Dr. and refocus traffic to the Chapel Gate Dr. and CSTC Entrance driveways.
  - An alternative to a traffic signal is a roundabout. Roundabouts do not create fixed stops and do not have adopted "warrant" criteria. Roundabouts do involve additional right-of-way.
  - Close or add gates (restrictions) to existing main campus access off Sentinel Dr. and Golf Course Rd. West St. could be gated and restricted for service vehicles only. Kids First Pl. could also be gated, for fire and emergency vehicle access to the site only. Also, vehicle access to campus' other secondary entrances off Golf Course Rd. could be restricted. By restricting or eliminating these access, the

campus traffic would be forced to access the site off Steilacoom Blvd SW, which would mitigate neighborhood concerns with campus traffic impacting the high school and residents.
    - The Proposed Action includes new buildings nearer to the Chapel Gate Dr. and CSTC Entrance where enhanced accessibility would allow support improvements to driveway traffic control off Steilacoom Blvd SW.
- Support. DSHS should provide their support for non-motorized and turn lane improvements on Steilacoom Blvd. SW, planned by both the Town of Steilacoom and City of Lakewood. The Proposed Action to support improvements by the Town of Steilacoom and City of Lakewood.
- Parking. Consolidate, mark, pave and manage parking areas to reduce parking sprawl on campus. Designate areas for staff based on the location and function of employees. The Proposed Action is consolidating parking and parking designations will be addressed with building-out of the site.

Introduction

This report describes the traffic impacts associated with an update of the Master Plan for WSH. The purpose of this report is to identify potentially significant and adverse traffic impacts and, where appropriate, outline programmatic and/or physical improvements to minimize or eliminate those impacts.

The study area for this analysis focuses on the public roadways and intersections fronting the WSH campus.

Project Location and Existing Use

WSH is located at 9601 Steilacoom Blvd. SW, in the City of Lakewood, WA.

Figure 1 shows the campus and surrounding roadway network.

The main campus is bordered by Steilacoom Blvd. SW and Fort Steilacoom Park, to the south; the former Fort Steilacoom Golf Course and Golf Course Rd., to the north, Sentinel Dr. SW/Farwest Dr. SW and Steilacoom High School, to the west; and 87th Ave. SW, to the east. Sentinel Dr. SW/Farwest Dr. SW separates the City of Lakewood from the Town of Steilacoom.

The site is zoned "Public/Institutional (PI)" by the City of Lakewood.

Project Description

The campus includes two major zones: Adult Hospital Zone and Adolescent Hospital Zone. Figure 1 shows the campus divided into four sub-zone: Adult Hospital West, Adult Hospital Central, Adult Hospital East, and Adolescent Hospital Zone. The Oakridge Group Home and West Pierce Fire and Rescue Station (No. 24) are on the campus but are under separate ownerships and are not connected to the campus by internal roadways.

The DSHS is proposing to reduce the number of civil patients on campus and expand both forensic and child services over a 10-year period. The Master Plan includes demolishing about 264,825 sq. ft. of existing building area, adding about 720,740 sq. ft. of new building area to the campus, including upgrading the existing central campus area and historic For Steilacoom Fort, and constructing a new community hospital on the campus.

Table 1 summarizes the number of patient beds of the existing and proposed for the future campus, broken down by bed type.

Table 1: Existing and Proposed Number of Beds

Bed Type	Existing Baseline	Near Term (1-5 years)[1]	Mid Term (6-10 years)[1]
Center for Forensic Services (CFS)	360	458	533
Civil Commitment (Civil)	500	348	153
Child Study and Treatment Center (CSTC)	47	65	65
New CFS Hospital	0	0	350
New Community Hospital	0	0	48
Oakridge Group Home[2]	16	16	16
Total	923	887	815

1. Master Plan
2. Not part of main campus

A conceptual site plan included as Figure 2.

Figure 1: Vicinity Map

Figure 2: Conceptual Site Plan

In additional to reducing the total number of beds on the campus, DSHS has also expressed their desire to increase accessibility to Steilacoom Blvd. SW. Site access enhancements on Steilacoom Blvd SW include improving traffic control at Chapel Gate Dr., removal of the existing signal and restricting turning movements at Circle Dr., and relocating the existing CSTC Entrance further east and improving traffic control. Traffic control improvements may include signalization. Additionally, the South St. driveway on Sentinel Dr. would be vacated and use of the 87th Ave. SW as an access-way to/from the campus' existing gravel lot is contemplated as being permanently gated and closed.

These access enhancements are intended to encourage more campus vehicle traffic on and off Steilacoom Blvd. SW as opposed to Sentinel Dr. and 87th Ave. SW.

Campus Accesses

The existing main campus includes six major driveways off the public roadway network:

- Two driveways off Sentinel Dr., at West St. and South St.
- Three driveways off Steilacoom Blvd. SW, at Chapel Gate Dr., Circle Dr. and CSTC Entrance
- Two driveways off Golf Course Rd., at Kid's First Pl. and at WSH's gravel lot

Gated accesses include South St. off Sentinel Dr. and the WSH's gravel lot off Golf Course Rd.

Internal roadways connect between the major campus areas.

Oakridge Group Home and the fire station are adjacent uses to the campus; however, both are operated independently of the campus. There are not internal roadway connections between the campus and Oakridge Group Home and the fire station.

Parking

The existing campus parking is dispersed around the campus grounds. The future Master Plan includes consolidating parking areas and improving visitor, staff, maintenance and service vehicle parking, adding pavement markings and signing. The future parking supply will meet the needs of the campus.

Study Area

This focuses on the following study intersections:

- Sentinel Dr. / Farwest Dr. SW and West St. (campus access)
- Sentinel Dr. / Farwest Dr. SW and South St. (campus access)
- Farwest Dr. SW and Steilacoom Blvd. SW
- Chapel Gate Dr. and Steilacoom Blvd. SW (campus access)
- Circle Dr. and Steilacoom Blvd. SW (campus access)
- CSTC Entrance and Steilacoom Blvd. SW (campus access)
- 87th Ave. SE and Steilacoom Blvd. SW
- 87th Ave. SE and Oakridge Group Home (standalone campus access)
- 87th Ave. SE and Golf Course Rd.
- Kids First Pl. and Golf Course Rd. (campus access)

Existing Traffic Conditions

The following describes the existing transportation system and its operational characteristics.

Major Roadway Network

- Steilacoom Blvd. SW is classified as a Principal Arterial in the City of Lakewood. West of Farwest Dr. SW, the roadway has a 3-lane cross-section with a center turn lane. Fronting WSH, the roadway has a 4-lane cross-section with no center turn lane. East of 87th Ave. SW, the roadway has a 5-lane cross-section with a center turn lane. The posted speed limit is 35-mph. Fronting WSH, signalized intersections are at Farwest Dr. SW, Circle Dr., and 87th Ave. SW. Both sides of Steilacoom Blvd. SW are lined with curb and gutter. A shared-use path is on the Fort Steilacoom Park side of Steilacoom Blvd. SW.
- Farwest Dr. SW/Sentinel Dr. is classified as a Minor Arterial in the Town of Steilacoom. North of Steilacoom Blvd. SW, Farwest Drive SW becomes Sentinel Dr. approaching Steilacoom High School. Farwest Dr. SW has a 5-lane cross-section and a posted speed limit of 35-mph south of Steilacoom Blvd. SW. Sentinel Dr. is 2-lanes wide and has posted 20-mph school zone speed signs. On Sentinel Dr. SW, curb, gutter and sidewalk extend from Steilacoom Blvd. SW to the high school. The intersection of Farwest Dr. SW and Sentinel Dr. SW is signalized at Steilacoom Blvd. SW.
- 87th Ave. SW is classified as a Minor Arterial at Steilacoom Blvd. SW and a Collector Arterial to the north of Golf Course Rd. Near Steilacoom Blvd. SW, the roadway has a 5-land cross-section that transitions into a 3-lane section near Oakridge Group Home and later transitions into a 2-lane roadway at Onyx Dr. SW, north of Golf Course Rd. The posted speed limit is 30-mph and the roadway include curb, gutter and sidewalk on both sides.
- Golf Course Rd. is an access road between the former Fort Steilacoom Golf Course, which closed in September 2018, and 87th Ave. SW. Golf Course Rd. is stop sign controlled at 87th Ave. SW. The roadway is paved but includes no pavement markings or marked pedestrian facilities. Disc golf players currently use the open field areas accessible off Golf Course Rd. There are pullouts for parking alongside the roadway to the east of Kids First Pl. and the CSTC campus.

Traffic Volumes

Year 2019 traffic volumes were collected by Traffic Count Consultants, Inc., an independent traffic data collection firm.

Pneumatic tube counters were located to capture daily traffic volumes at seven of the eight campus accesses and on Steilacoom Blvd. SW near the Chapel Gate Dr. and CSTC Entrance between May 28 and May 30, 2019. Figure 3 illustrates the calibrated daily traffic volumes around and at the campus.

Tube counters were not located at the gated WSH gravel lot access since the access was closed during the initial field reviews, WSH management indicated that this access is opened periodically to support campus traffic flows. It is noted that the former Steilacoom Golf Course and public land area surrounding Golf Course Rd. is currently used for disc golf course and other recreational activities.

The AM and PM peak hour periods are defined as the highest 4 consecutive 15-minute traffic volume intervals between 7 and 9 AM and between 4 and 6 PM. These periods represent conditions when traffic volumes on the local roadways are typically at their highest and correspond, in general, to traditional peak commute times.

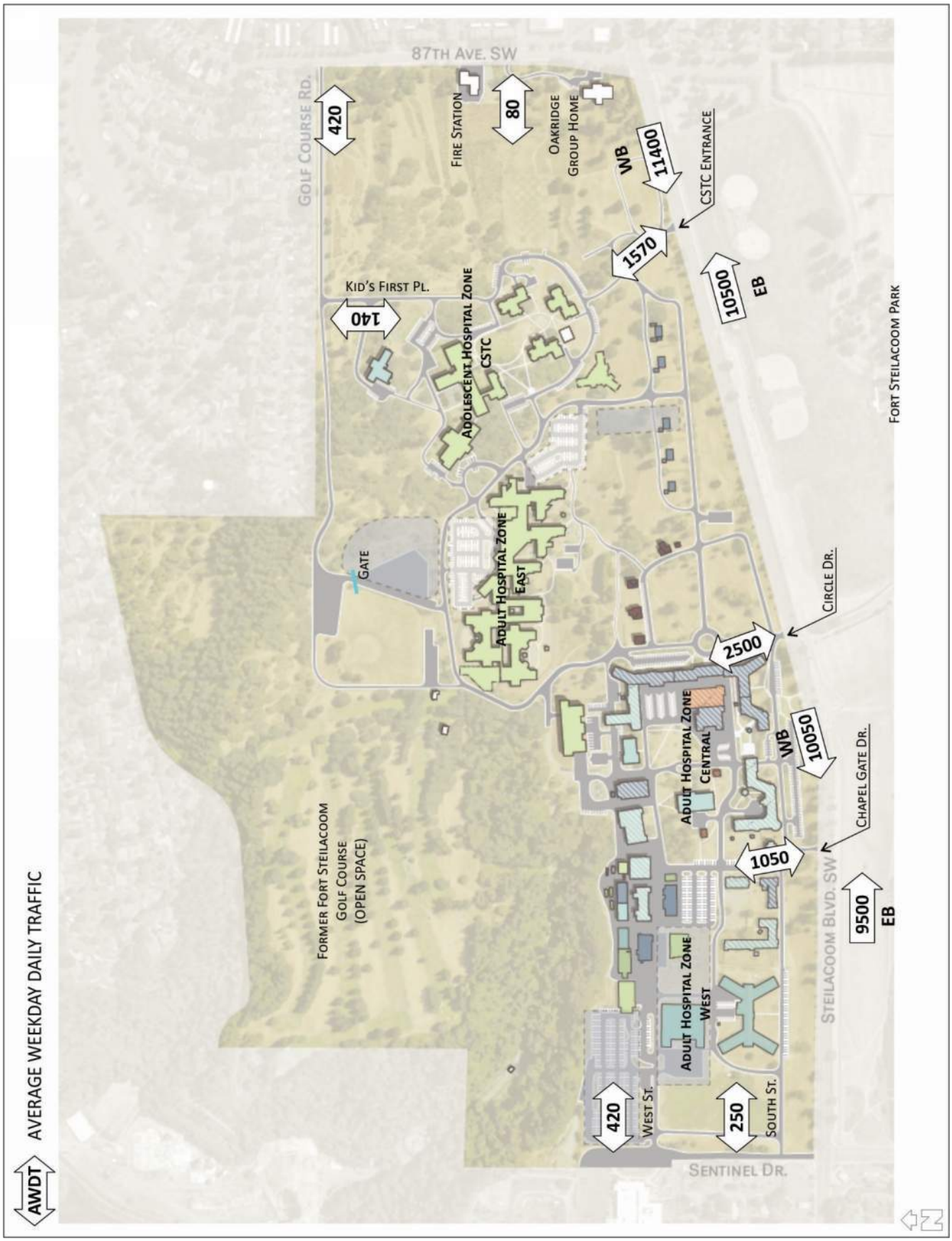


Figure 3: Average Weekday Daily Traffic Volumes

AM and PM peak hour intersection turning movement volumes were collected at the study intersections on Thursday, May 30, 2019 and Thursday, July 20, 2019. The driveway and intersection turning movement volumes were calibrated to be consistent with the daily traffic volumes. The raw count data is attached. Figure 4 illustrates the existing AM and PM peak hour traffic volumes at the study intersections and driveways.

Level-of-Service

Study area LOS was evaluated using the Synchro computer program and HCM 2010 methodology. Table 2 summarizes the intersection level-of-service and delay categories.

Table 2: Intersection Level-of-Service and Delay Categories

LOS	Signalized Intersection Delay	Stop-Controlled Intersection Delay
A	≤ 10 seconds	≤ 10 seconds
B	10-20 seconds	10-15 seconds
C	20-35 seconds	15-25 seconds
D	35-55 seconds	25-35 seconds
E	55-80 seconds	35-50 seconds
F	> 80 seconds	> 50 seconds

The City of Lakewood's level-of-service standards are as follows:

- Maintain LOS D with a V/C ratio threshold of 0.90 during weekday PM peak hour conditions on all arterial streets and intersections in the city, including state highways of statewide significance except as otherwise identified.
- Maintain LOS D during weekday PM peak hour conditions at all arterial street intersections in the city, including state highways of statewide significance except as otherwise identified.
- Maintain LOS F with a V/C ratio threshold of 1.10 in the Steilacoom Blvd. corridor between 88th St. SW and 83rd Ave. SW.
- Maintain LOS F with a V/C ratio threshold of 1.30 on Gravelly Lake Dr. between I-5 and Washington Blvd. SW and Washington Blvd. SW, west of Gravelly Lake Dr.
- The City may allow two-way and one-way stop-controlled intersections to operate worse than the level-of-service standards. However, the City requires that these instances be thoroughly analyzed from an operational and safety perspective.

Intersection Level of Service

Table 3 summarizes the existing peak hour intersection operations and the output is included in the Appendix.

The study intersections are calculated to operate at LOS D or better and satisfy the City of Lakewood's LOS threshold, except the CSTC Entrance at Steilacoom Blvd. SW. The southbound stop-controlled approach at CSTC Entrance is calculated to operate at LOS F, in the AM peak hour, and LOS E, in the PM peak hour.

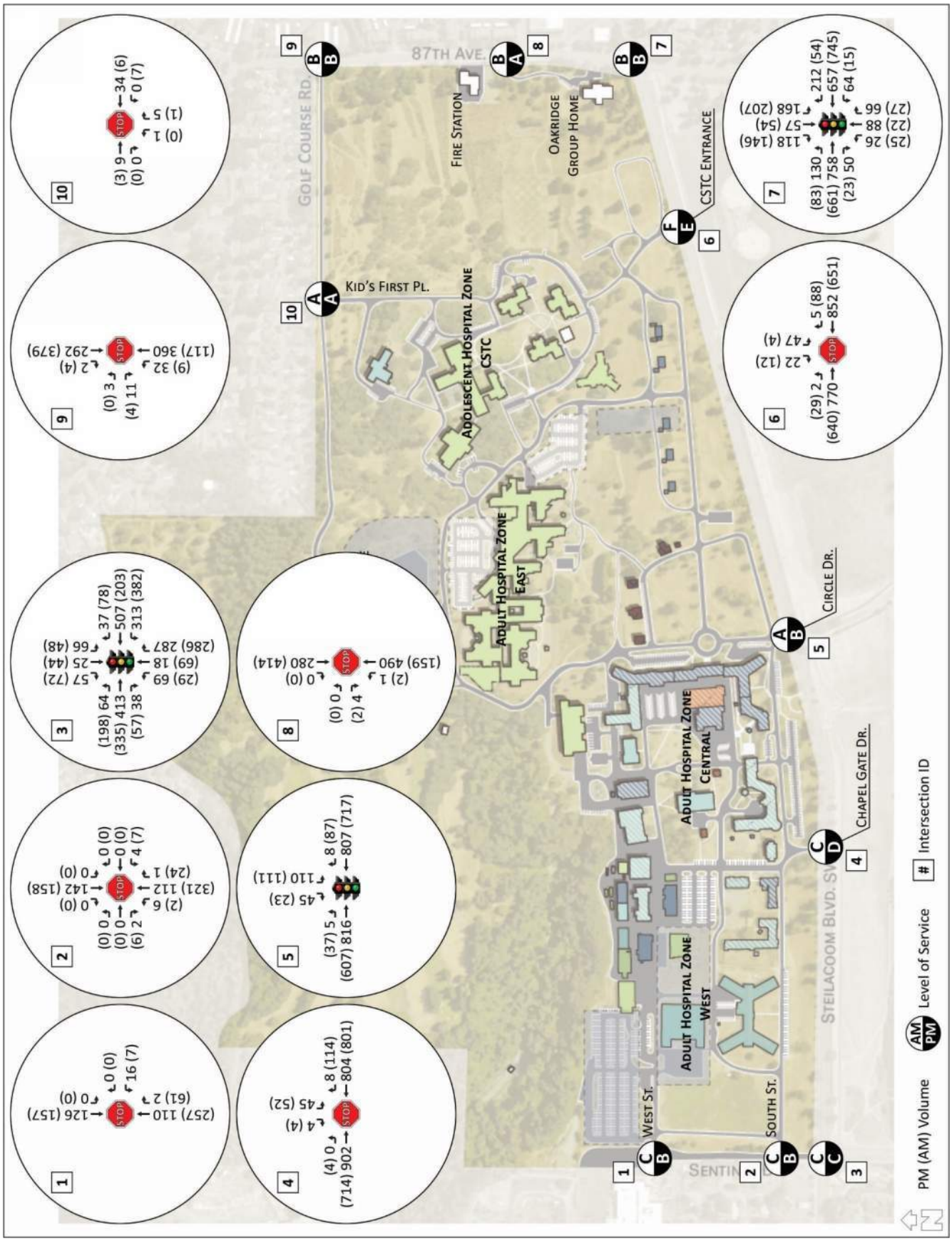


Figure 4: Existing AM and PM Peak Hour Traffic Volumes

Table 3: Existing AM and PM Peak Hour Intersection LOS

Intersection	Control	AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
Sentinel Dr. / West St.	WB Stop	C	19.1	B	11.3
Sentinel Dr. / South St.	WB Stop	C	22.1	B	10.8
Farwest Dr. / Steilacoom Blvd.	Signal	C	28.3	C	33.4
Chapel Gate Dr. / Steilacoom Blvd.	SB Stop	C	15.2	D	32.8
Circle Dr. / Steilacoom Blvd.	Signal	A	5.3	B	14.6
CSTC Entrance / Steilacoom Blvd.	SB Stop	F	52.7	E	39.9
87th Ave. / Steilacoom Blvd.	Signal	B	16.6	B	19.1
87th Ave. / Oakridge Group Home	EB Stop	B	10.9	A	9.9
87th Ave. / Golf Course Rd.	EB Stop	B	10.9	B	10.6
Kids First Pl. / Golf Course Rd.	NB Stop	A	8.3	A	8.4

Arterial Level of Service

Table 4 summarizes the existing peak hour arterial LOS on Steilacoom Blvd. SW. The arterial capacity is from the City of Lakewood's Comprehensive Plan EIS and the LOS is expressed as a V/C ratio. The arterial volumes on Steilacoom Blvd. SW in the vicinity of the campus satisfies the V/C threshold from the City of Lakewood.

Table 4: Existing Arterial LOS on Steilacoom Blvd. SW

Direction	Capacity[1]	Maximum Volume[2]	V/C Ratio
Eastbound	1,825	992	0.54
Westbound	1,825	933	0.51

1. City of Lakewood Comprehensive Plan Final EIS – June 2000
2. Maximum PM peak hour volume in one direction

Vehicle Queuing (Stacking)

Existing vehicle queues were computed at the existing study intersections using the HCM 2010 95th-percentile queue equations to identify existing vehicle queue impacts around the campus. 95th-percentile queues are typically used for traffic design and are a statistical calculation of the vehicle queue length that has a 5% probability of occurring during the analysis hour. Table 5 summarizes the queue output.

- The 95th-percentile queues are noticeable, but the intersection and driveway spacing on Steilacoom Blvd. SW are more than sufficient to support the computed queues.
- The westbound left turn queue on Steilacoom Blvd. SW approaching Farwest Drive. SW is computed to exceed the 200-foot storage pocket in both the AM and PM peak hours, by up to 150 feet. Overall, the westbound approach queues, overall, do not extend into the adjacent Chapel Game Dr. intersection.
- The southbound queue at Chapel Gate Dr. approaching Sentinel Dr. SW is computed to be up to 40 feet.
- The southbound queue at Circle Dr. approaching Steilacoom Blvd. SW is computed to be 80 feet. The Circle Dr. and internal Front St. intersection is located approximately 25 feet north of the signalized intersection. Peak hour queues were observed to frequently extend through the internal intersection from Steilacoom Blvd. SW.
- The southbound queue at CSTC Entrance approaching Sentinel Dr. SW is computed to be up to 55 feet.
- The eastbound left turn queue Steilacoom Blvd. SW approaching 87th Ave. SW is computed to fit within the 200-foot storage pocket in both the AM and PM peak hours.
- The AM peak hour southbound left turn queue on 87th Ave. SW approaching Steilacoom Blvd. SW is computed to exceed the 125-foot storage pocket, by 40 feet or roughly two vehicle lengths.

Table 5: Existing Steilacoom Blvd. SW 95th-Percentile Queue Analysis

Intersection	Mvmt.	AM Peak Hour			PM Peak Hour			Storage (feet)
		Q-V/L[1]	Q-feet[2]	V/C	Q-V/L[1]	Q-feet[2]	V/C	
Farwest Dr. / Steilacoom Blvd.	WB L	14.0	350	0.77	12.9	325	0.74	200
	WB T	6.3	160	0.25	11.9	300	0.45	1,380
	WB TR	6.3	160	0.26	12.2	305	0.45	1,380
	SB L	2.7	70	0.26	4	100	0.51	125
	SB TR	7.1	180	0.68	5.1	130	0.69	140
Chapel Gate Dr. / Steilacoom Blvd.	SB App.	0.1	5	0.05	1.6	40	0.36	
Circle Dr. / Steilacoom Blvd.	EB LT	3.3	85	0.36	10.1	255	0.58	1,000
	EB T	3.0	75	0.40	9.1	230	0.63	1,000
	WB T	4.2	105	0.47	9.2	230	0.60	1,955
	WB TR	4.2	105	0.47	9.6	240	0.60	1,955
	SB LT	2.1	55	0.50	3.1	80	0.21	25
CSTC Entrance / Steilacoom Blvd.	SB App.	2.1	55	0.47	1.4	35	0.34	
87th Ave. / Steilacoom Blvd.	EB L	2.9	75	0.78	5.3	135	0.79	200
	EB T	7.7	195	0.42	9.8	245	0.51	685
	EB TR	7.9	200	0.42	10	250	0.51	685
	SB L	6.6	165	0.58	0.7	20	0.48	125
	SB TR	1.6	40	0.19	1.6	40	0.18	550
	SB R	4.6	115	0.59	3.6	90	0.42	250

1. queue expressed as vehicles per lane
2. queue lengths are converted to fee with approximately 25 feet per vehicle and are rounded to the nearest multiple of "5"

Traffic Circulation

- Figure 5 shows the existing major traffic circulation routes on the campus.
- Figure 6 shows the existing patient admissions and discharge route to and from the WSH campus.
- Figure 7 shows the existing on-campus shuttle routes.
- Figure 8 shows the existing service routes.

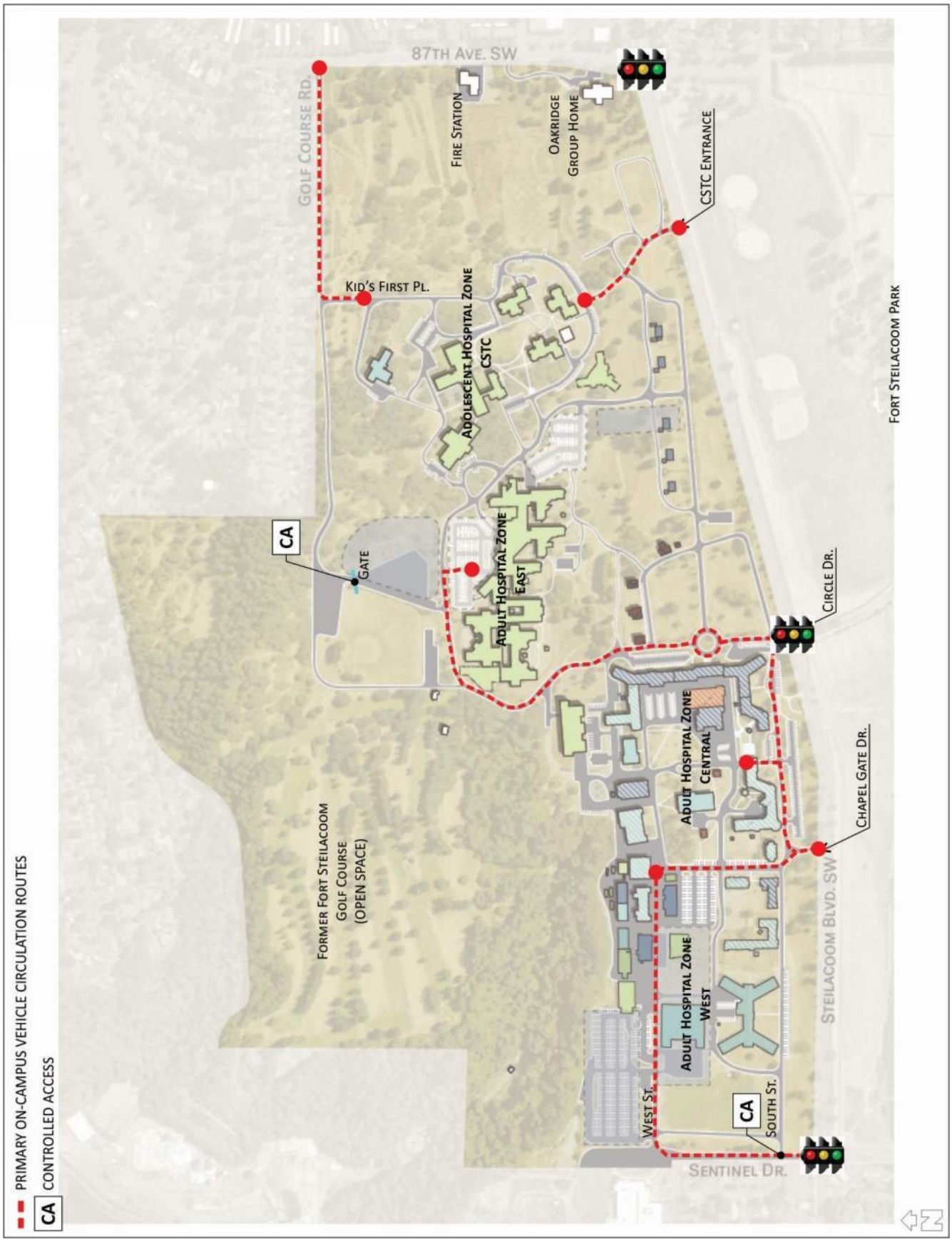


Figure 5: Existing On-Campus Primary Vehicle Circulation Routes

Figure 6: Existing Patient Admissions and Discharge Route

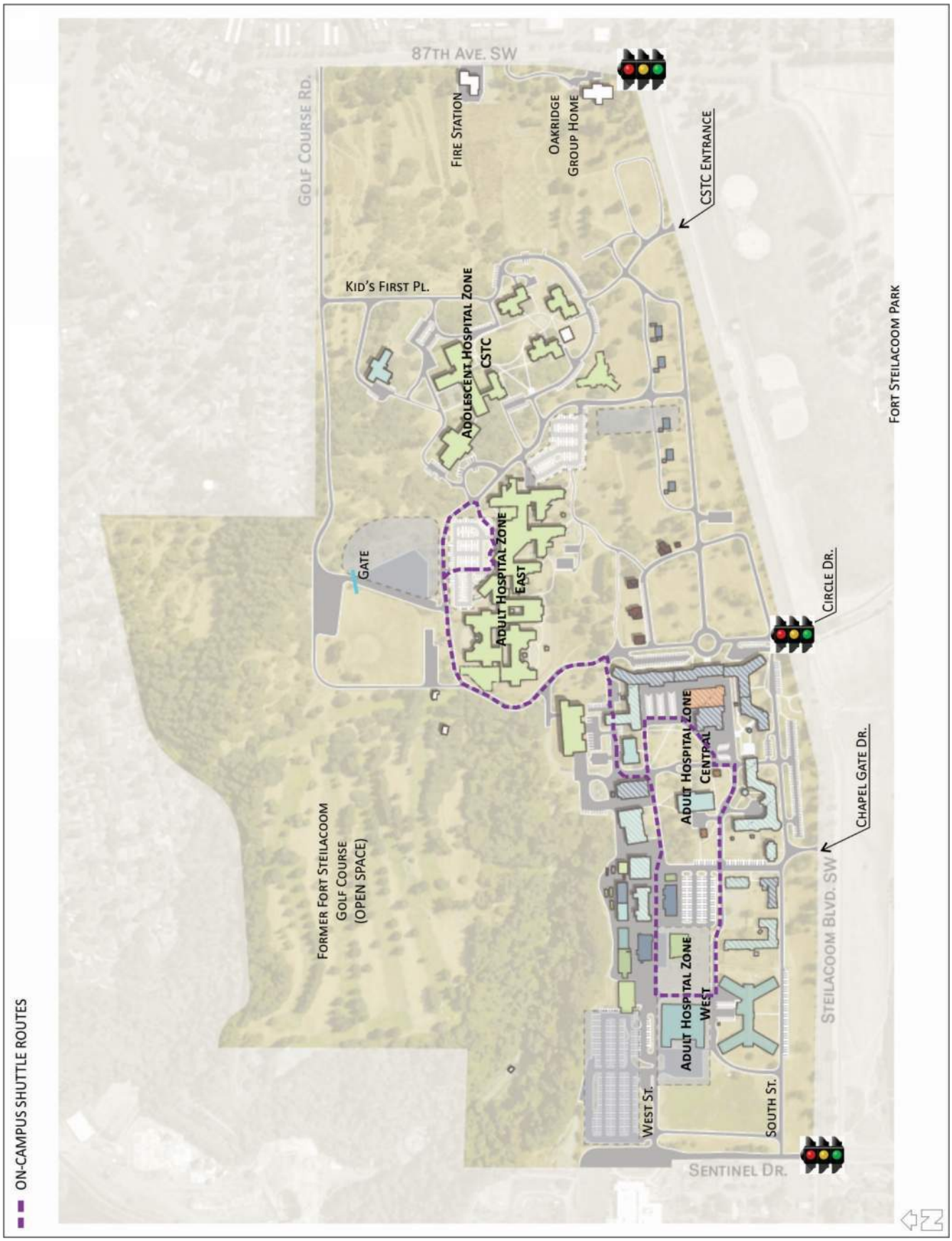


Figure 7: Existing On-Campus Shuttle Route

Figure 8: Existing Service Routes

Safety

A 6-year crash history was provided by the WSDOT for the area surrounding the campus on Sentinel Drive, Steilacoom Blvd SW, 87th Ave SW, and Golf Course Road Table 6 summarizes the crash history by year and resulting crash rates. Table 7 summarizes the crashes by location and by crash type.

Table 6: Crash History per Year

Location	Number of Crashes Reported per Year					Avg. Crashes	Est. AWDT [1]	Crash Rate
	2013	2014	2015	2016	2017			
Intersection								**MEV [2]**
87th Ave. at 82nd Street	0	0	0	1	0	0.20	6,000	0.09
87th Ave. at 83rd Street Ct.	0	1	1	0	1	0.60	6,000	0.27
87th Ave. at Oakridge Group Home	0	2	0	0	0	0.40	7,700	0.14
Steilacoom Blvd. at Farwest Drive	4	12	3	4	2	5.00	18,900	0.72
Steilacoom Blvd. at Chapel Gate Dr.	1	0	2	0	1	0.80	17,000	0.13
Steilacoom Blvd. at Circle Dr.	1	3	0	2	2	1.60	18,000	0.24
Steilacoom Blvd. at CSTC Entrance	0	0	0	0	1	0.20	17,700	0.03
Steilacoom Blvd. at 87th Ave.	3	1	3	3	5	3.00	23,900	0.34
Segment								**MVM [3]**
87th Ave. north of 82nd St.	0	0	1	0	0	0.20	6,000	1.29
87th Ave.: 82nd Street to 83rd St.	0	0	0	0	0	0.00	6,000	0.00
87th Ave.: 83rd Street to Steilacoom Blvd.	0	3	0	0	1	0.80	7,700	1.77
Sentinel Dr. north of Steilacoom Blvd.	0	1	0	0	0	0.20	2,700	4.76
Steilacoom Blvd.: Farwest to Chapel Gate	2	5	5	4	0	3.20	16,500	1.91
Steilacoom Blvd.: Chapel Gate to Circle Dr.	3	2	3	0	0	1.60	16,800	1.32
Steilacoom Blvd.: Circle Dr. to CSTC Entry	0	0	0	1	1	0.40	17,500	0.16
Steilacoom Blvd.: CSTC Entry to 87th Ave.	0	0	0	1	3	0.80	17,600	0.82
Golf Course Rd. west of 87th Ave.	0	0	0	0	1	0.20	500	1.10

1. Estimated Average Weekday Daily Traffic
2. Crashes per Million Entering Vehicles
3. Crashes per Million Vehicle Miles Traveled

Table 7: Crash History by Type

Location	Rear-End	Fixed Object	Opp. Dir. Left[1]	Side-swipe	Entering at Angle	Ped. / Bike	Other
Intersection							
87th Ave. at 82nd Street	0	1	0	0	0	0	0
87th Ave. at 83rd Street Ct.	1	0	0	0	2	0	0
87th Ave. at Oakridge Group Home	0	1	0	0	0	1	0
Steilacoom Blvd. at Farwest Drive	11	3	8	1	1	0	1
Steilacoom Blvd. at Chapel Gate Dr.	1	0	0	0	2	0	1
Steilacoom Blvd. at Circle Dr.	4	1	1	0	2	0	0
Steilacoom Blvd. at CSTC Entrance	0	0	1	0	0	0	0
Steilacoom Blvd. at 87th Ave.	5	1	3	4	2	0	0
Segment							
87th Ave. north of 82nd St.	0	0	0	0	0	1	0
87th Ave.: 82nd Street to 83rd St.	0	0	0	0	0	0	0
87th Ave.: 83rd Street to Steilacoom Blvd.	2	1	0	0	0	1	0
Sentinel Dr. north of Steilacoom Blvd.	1	0	0	0	0	0	0
Steilacoom Blvd.: Farwest to Chapel Gate	9	3	0	2	0	0	2
Steilacoom Blvd.: Chapel Gate to Circle Dr.	2	2	0	3	0	0	1
Steilacoom Blvd.: Circle Dr. to CSTC Entry	1	0	0	0	0	0	1
Steilacoom Blvd.: CSTC Entry to 87th Ave.	1	1	0	2	0	0	0
Golf Course Rd. west of 87th Ave.	0	0	0	0	0	0	1

1. Reported as “Opposite Direction - One Left - One Straight” and not “Entering at Angle”

Between 2013 and 2017 there were 96 collisions reported and 69% of those crashes resulted in property damage only. In 2015 there was one fatality reported on Steilacoom Blvd. SW with a vehicle in the eastbound direction colliding with the rock wall along the roadway.

Overall, the number of reported crashes peaked in 2014, with 30 total crashes reported. Compared to the other years, where the annual number of crashes ranged from 14 to 18 per year.

In general, intersections with crash rates of 1.00 crashes per million entering vehicles and roadway segments with crash rates of 10.00 crashes per million vehicle miles traveled are considered as high crash locations. None of the study area intersections or roadway segments meeting these crash rate thresholds.

The study area crashes included: rear-end (40%), fixed object (15%), opposite direction (14%), sideswipe (12%), entering at angle (9%), pedestrian or bicyclist (3%) and other (7%). On Steilacoom Blvd. SW the low rock walls on both sides of the roadway and lack of a center lane or turn lane factors into the types of crashes reported, with rear ends, opposite direction, sideswipes, entering at angle crashes.

Non-Motorized Conditions

Sentinel Dr. SW includes sidewalks on both sides of the roadway from Steilacoom Blvd. SW to the high school. There is one east-west crossing at the south end of the southmost high school driveway.

A shared-use path is along the Fort Steilacoom Park side of Steilacoom Blvd. SW. A tunnel under Steilacoom Blvd. SW provides direct access between the campus to the park. The signalized intersection at Circle Dr. includes marked crosswalks on the north and west legs of the intersection.

87th Ave. SW includes sidewalks and bicycle lanes on both sides of the roadway from Steilacoom Blvd. SW to Onyx Dr. SW, just north of Golf Course Rd.

There are no marked pedestrian facilities on Golf Course Rd.

Transit Conditions

Pierce Transit Route 212 Steilacoom provides weekday and weekend services along Steilacoom Blvd. SW and to Pierce College. Weekday headways are about 50 minutes in length. Transit stops are located at Farwest Dr. SW, between Chapel Gate Dr. and Circle Dr. and at 87th Ave. SW.

Future No Action

This section summarizes the future traffic conditions prior without improvement and modifications to the existing campus. The future "No Action" condition represents a baseline condition against which to measure specific impacts related to the proposed Master Plan.

Horizon Year

The Master Plan represents a 10-year build-out plan for WSH. For this analysis the horizon year is 2030.

The Comprehensive Plans from the City of Lakewood Comprehensive Plan and Town of Steilacoom were reviewed to estimate traffic growth in the study area. On Steilacoom Blvd. SW, the traffic volumes were forecast to grow by less than 0.5% per year, based on information from the Town of Steilacoom.

To be conservative, between now and 2030 traffic volumes around the WSH campus is estimated to grow at a rate of 1.0% annually. The growth rate includes both regional and local traffic growth.

The No Action analysis does not assume any growth on the campus and at the high school.

Transportation Improvements

The City of Lakewood's Six-Year 2020-2025 Transportation Improvement Plan (TIP) identifies the following transportation facility improvements near the campus:

- 302.0024 Steilacoom Blvd. SW – Farwest Dr. SW to Phillips Rd. SW. Acquire right-of-way to design and construct curb, gutter, sidewalk, sharrows, turn lanes, street lighting, drainage and overlay. Right-of-way acquisition and design are funded, and construction is not. With the exception of design, the project is anticipated to be complete by 2021. (Lakewood TIP)
- 302.0117 Roundabout 87th Ave. SW, Dresden Ln. SW and Fort Steilacoom Park Entrance. Constructs roundabout, with curb, gutter, sidewalk, sharrows, street lighting, drainage, roadway reconstruction and signage at the park entrance on 87th Ave. SW. This project is not currently funded. (Lakewood TIP)

The Town of Steilacoom's Six-Year Transportation Improvement Plan 2019 to 2024 and Comprehensive Plan identify the following transportation facility improvements near the campus:

- Steilacoom Blvd. SW Non-Motorized Improvements. Design and construct curb, gutter, sidewalk and bike lanes on Steilacoom Blvd. SW from Puyallup St. to Farwest D. SW. The project is fully funded, and completion is anticipated in 2019. (Steilacoom TIP/Comprehensive Plan)

Transportation facility improvements are incorporated into the analyses of future traffic conditions.

Traffic Volumes

Figure 9 illustrates the future no action traffic volumes.

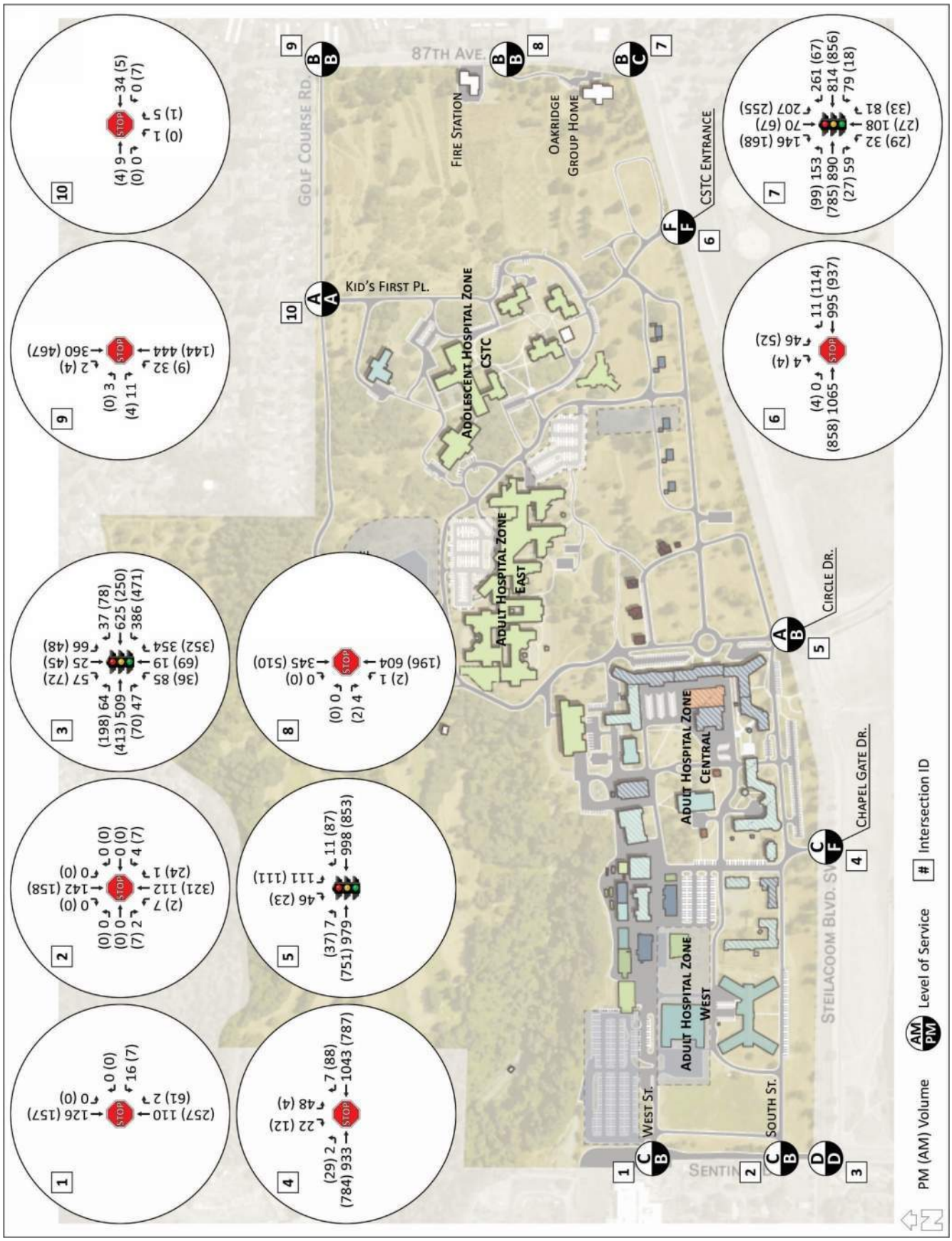


Figure 9: Future No Action AM and PM Peak Hour Traffic Volumes

Level of Service

Intersection Level of Service

Table 8 summarizes the future no action study intersection LOS.

Table 8: Future No Action AM and PM Peak Hour Intersection LOS

Intersection	Control	AM Peak Hour				PM Peak Hour			
		Existing		No Action		Existing		No Action	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Sentinel Dr. / West St.	WB Stop	C	19.1	C	19.1	B	11.3	B	11.3
Sentinel Dr. / South St.	WB Stop	C	22.1	C	18.8	B	10.8	B	10.8
Farwest Dr. / Steilacoom Blvd.	Signal	C	28.3	D	36.9	C	33.4	D	41.5
Chapel Gate Dr. / Steilacoom Blvd.	SB Stop	C	15.2	C	18.3	D	32.8	F	60.1
Circle Dr. / Steilacoom Blvd.	Signal	A	5.3	A	5.3	B	14.6	B	14.4
CSTC Entrance / Steilacoom Blvd.	SB Stop	F	52.7	F	100	E	39.9	F	74.8
87th Ave. / Steilacoom Blvd.	Signal	B	16.6	B	19.3	B	19.1	C	21.8
87th Ave. / Oakridge Group Home	EB Stop	B	10.9	B	11.8	A	9.9	B	10.4
87th Ave. / Golf Course Rd.	EB Stop	B	10.9	B	11.7	B	10.6	B	11.3
Kids First Pl. / Golf Course Rd.	NB Stop	A	8.3	A	8.4	A	8.4	A	8.5

In the future, the additional non-WSH traffic volumes result in increases in control delay at the study intersections. The study intersections are forecast to operate at LOS D or better and satisfy the City of Lakewood's LOS threshold, except the Chapel Gate Dr. and CSTC Entrance driveways off Steilacoom Blvd. SW.

- In the AM peak hour, the Chapel Gate Dr. stop-controlled approach to Steilacoom Blvd. SW is calculated to operate at LOS C (existing) and LOS C (No Action). In the PM peak hour, the approach is calculated to operate at LOS D (existing) and LOS F (No Action).
- In the AM peak hour, the CSTC Entrance stop-controlled approach to Steilacoom Blvd. SW is calculated to operate at LOS F (existing) and LOS F (No Action). In the PM peak hour, the approach is calculated to operate at LOS E (existing) and LOS F (No Action).

Arterial Level of Service

Table 9 summarizes the future No Action peak hour arterial LOS on Steilacoom Blvd. SW. The future arterial volumes on Steilacoom Blvd. SW in the vicinity of the campus satisfy the City of Lakewood's V/C threshold.

Table 9: No Action Arterial LOS on Steilacoom Blvd. SW

Direction	Capacity[1]	Existing V/C	No Action Vol.[2]	No Action V/C
Eastbound	1,825	0.54	1,178	0.65
Westbound	1,825	0.51	1,154	0.63

1. City of Lakewood Comprehensive Plan Final EIS – June 2000
2. Maximum PM peak hour volume in one direction

Vehicle Queuing (Stacking)

Vehicle queues were computed using the HCM 2010 95th-percentile queue equations to evaluate future vehicle queue impacts around the campus. Table 10 summarizes the queue output.

Table 10: Future No Action Steilacoom Blvd SW Queues

Intersection	Mvmt.	AM Peak Hour			PM Peak Hour			Storage (feet)
		Q-V/L[1]	Q-feet[2]	V/C	Q-V/L[1]	Q-feet[2]	V/C	
Farwest Dr. / Steilacoom Blvd.	WB L	22.3	560	0.95	12.8	320	0.97	200
	WB T	7.8	195	0.29	14.5	365	0.55	1,380
	WB TR	7.8	195	0.30	14.9	375	0.55	1,380
	SB L	2.8	70	0.26	4.0	100	0.51	125
	SB TR	7.4	185	0.69	5.1	130	0.69	140
Chapel Gate Dr. / Steilacoom Blvd.	SB	0.2	5	0.06	2.7	70	0.54	
Circle Dr. / Steilacoom Blvd.	EB LT	4.2	105	0.42	11.6	290	0.63	1,000
	EB T	4.0	100	0.74	10.8	270	0.68	1,000
	WB T	5.1	130	0.52	11.1	280	0.66	1,955
	WB TR	5.2	130	0.52	11.5	290	0.66	1,955
	SB LT	2.4	60	0.54	3.3	85	0.23	25
CSTC Entrance / Steilacoom Blvd.	SB	3.4	85	0.68	2.4	60	0.53	
87th Ave. / Steilacoom Blvd.	EB L	4.1	105	0.78	7.0	175	0.80	200
	EB T	9.6	240	0.51	12.0	300	0.60	685
	EB TR	9.6	240	0.51	12.3	310	0.60	685
	SB L	8.9	225	0.73	2.9	75	0.61	125
	SB TR	2.0	50	0.22	2.1	55	0.22	550
	SB R	5.4	135	0.63	4.6	115	0.51	250

1. queue expressed as vehicles per lane
2. queue lengths are converted to fee with approximately 25 feet per vehicle and are rounded to the nearest multiple of "5"

The 95th-percentile queues are noticeable, but the intersection and driveway spacing on Steilacoom Blvd SW are more than sufficient to support the computed queues.

- The westbound left turn queue on Steilacoom Blvd. SW approaching Farwest Dr. SW is computed to exceed the 200-foot storage pocket in both the AM and PM peak hours, by up to 360 feet. The peak hour westbound left turn V/C ratios are greater than 0.90 suggesting that the left turn movement is nearing capacity. Overall, the westbound approach queues, overall, do not extend into the adjacent Chapel Game Dr. intersection.
- The southbound queue at Chapel Gate Dr. approaching Sentinel Dr. SW is computed to be up to 70 feet.
- The southbound queue at Circle Dr. approaching Steilacoom Blvd. SW is computed to be 90 feet. The Circle Dr. and internal Front St. intersection is located approximately 25 feet north of the signalized intersection. Peak hour queues are forecast to continue to extend through the internal intersection from Steilacoom Blvd. SW.
- The southbound queue at CSTC Entrance approaching Sentinel Dr. SW is computed to be up to 85 feet.
- The eastbound left turn queue on Steilacoom Blvd. SW approaching 87th Ave. SW is computed to fit within the 200-foot storage pocket in both the AM and PM peak hours.
- The southbound left turn queue on 87th Ave. SW approaching Steilacoom Blvd. SW is computed to exceed the 125-foot storage pocket in the AM peak hour, by 100 feet or four vehicle lengths.

Traffic Circulation

The on-campus circulation is not forecast to substantially change in the future with the proposed No Action.

Safety

The crash frequency is forecast to increase proportional to the future traffic volumes.

Non-Motorized Conditions and Transit Conditions

The on-campus circulation and the non-motorized and transit conditions are not forecast to substantially change between now and 2030 with the No Action conditions.

Recommendations

The following outlines recommendations for the future No Action condition.

- Circulation. Improve the campus's internal roadway circulation by increasing the spacing between internal roadways and intersections and driveways.
- Access. Improve access to the campus by enhancing traffic flow to and from Steilacoom Blvd. SW via:
  - Install a traffic control signal at Chapel Gate Dr., with the intent of concentrating more traffic to this access and reducing traffic impacts on Sentinel Dr. The FHWA recommends that a traffic control signal meet certain "warrants", which are discussed later in this document.
  - Shift CSTC Entrance east and signalize the driveway, to increase the spacing between the CSTC Entrance and 87th Ave. SW and with the intent of concentrating more traffic to this access and reducing traffic impacts on 87th Ave. SW. The FHWA recommends that a traffic control signal meet certain "warrants", which are discussed later in this document.
  - Widen Steilacoom Blvd. SW to provide left turn pockets and acceleration lanes to improve left turn maneuvers to and from the campus. Left turn lanes would enhance site access by providing a "pocket" off of the mainline for vehicles to queue in before making a left turn to the campus. Acceleration lanes, in the form of a center turn lane, would allow staged left turn maneuvers (left turn out of campus to turn lane to merge with opposing traffic volume). Widening requires right-of-way acquisition.
  - An alternative to widening, is to reduce the number of lanes on Steilacoom Blvd. SW, this is often referred to as a "road diet". The lane reduction would create a three-lane cross-section with wide shoulders and bicycle lanes and a center turn lane. The FHWA recommends a feasibility study for a road diet of four- to three-lane roadway where the ADT is greater than 20,000 vehicles.
  - As alternative to traffic signals, install a single-lane (or multilane) roundabout. Unlike a signal, roundabouts have less of an impact on travel times since they are not creating designated stops for the mainline traffic flow. Roundabouts also do not have adopted "warrant" criteria.
  - Remove the existing signal at Circle Drive and Steilacoom Blvd SW, and repurposing the intersection to be right-in and right-out only restricted. This will decentralize access at Circle Dr. and refocus traffic to the Chapel Gate Dr. and CSTC Entrance driveways.
  - Close or add gates (restrictions) to existing main campus access off Sentinel Dr. and Golf Course Rd. West St. could be gated and restricted for service vehicles only. Kids First Pl. could also be gated, for fire and emergency vehicle access to the site only. Also, vehicle access to campus' other secondary entrances off Golf Course Rd. could be restricted. By restricting or eliminating these access, the campus traffic would be forced to access the site off Steilacoom Blvd SW, which would mitigate neighborhood concerns with campus traffic impacting the high school and residents.
- Support. DSHS should provide their support for non-motorized and turn lane improvements on Steilacoom Blvd. SW, planned by both the Town of Steilacoom and City of Lakewood.
- Parking. Consolidate, mark, pave and manage parking areas to reduce parking sprawl on campus. Designate areas for staff based on the location and function of employees

Trip Generation, Distribution and Assignment

This section describes the trip generation and PM peak hour trip distribution and travel assignment forecasts for the proposed Master Plan, or "Action" condition. The following analysis is consistent with the trip generation methodology from the traffic concurrency request and concurrency findings output.

Trip Generation

Trips generated by build-out of the Master Plan were forecast from the existing campus' driveway volumes. Trip rates were computed based on the number of vehicle trips generated per bed. Table 11 summarizes the trip forecast for the Proposed Action.

Table 11: Proposed Action Trip Generation Forecast

	"No Action" # of Beds[1,2]	"No Action" Trips	% (In/Out)	Rate (Trips/Bed)	"Action" # of Beds[1]	"Action" Trips	Trip Difference
AM Generator (6:30-7:30 AM)	907	828	66/34	0.91	799	727	(101)
AM Peak Hour (7:00-8:00 AM)	907	677	67/33	0.75	799	599	(78)
PM Generator (2:15-3:15 PM)	907	764	41/59	0.84	799	671	(93)
PM Peak Hour (4:00-5:00 PM)	907	366	16/84	0.40	799	320	(46)
Daily Trips	907	6,046	48/52	6.67	799	5,329	(717)

1. See Table 1
2. Excludes Oakridge Group Home, which is not proposing to change from its current 16 bed capacity.

Overall, the Proposed Action reduces the number of patient beds on the campus; and thus, is forecast to generate less trips compared to the current campus (No Action).

Campus Area Breakdown

Overall, the Proposed Action reduces the patient capacity of the main campus. Services in the existing civil and forensic care would be consolidated from 860 patient beds (No Action) to 336 patient beds (Proposed Action). Future conditions also include a new forensic hospital for 350 patients, expansion of the CSTC from 47 beds (No Action) to 65 beds (Proposed Action), and addition of new community hospital with 48 patient beds.

Tables 12 and 13 summarize the AM and PM peak hour trips generated by the major campus accesses.

Table 12: AM Peak Hour Trips Generation by Campus Area

Campus Area	Existing Campus			Proposed Action		
	In	Out	Total	In	Out	Total
Sentinel Drive Driveway(s)	85	14	99	70	15	85
Steilacoom Blvd West Driveway (Chapel Gate)	117	16	133	109	15	124
Steilacoom Blvd Central Driveway (Circle Drive)	124	134	258	95	106	201
Steilacoom Blvd Driveway East (CSTC)	118	56	174	117	61	178
87th Ave SW at Golf Course Road	11	2	13	10	1	11
Total	455	222	677	401	198	599

Table 13: PM Peak Hour Trips Generation by Campus Area

Campus Area	Existing Campus			Proposed Action		
	In	Out	Total	In	Out	Total
Sentinel Dr. Driveway(s)	3	20	23	3	20	23
Steilacoom Blvd. West Driveway (Chapel Gate Dr.)	9	70	79	15	60	75
Steilacoom Blvd. Central Driveway (Circle Dr.)	18	157	175	17	125	142
Steilacoom Blvd. East Driveway (CSTC)	11	50	61	16	59	75
87th Ave. SW at Golf Course Rd.	19	9	28	0	5	5
Total	60	306	366	51	269	320

Peak Hour Trip Assignment

Campus generated trips were distributed based on the traffic volumes at the campus driveways and on Steilacoom Blvd. SW and 87th Ave. SW.

This analysis assumes the future campus will generate similar peak hour trip patterns compared to existing conditions. With the Proposed Action:

- South St. driveway off Sentinel Dr. SW is vacated;
- CSTC Entrance is relocated about 800 feet to the west of its current location to be roughly midblock on Steilacoom Blvd. SW between Circle Dr. and 87th Ave. SW; and
- use of the gated access to the gravel lot off Golf Course Rd. is restricted with traffic redistributed to Steilacoom Blvd. SW.

Figure 10 illustrates the AM and PM peak hour trips of the existing campus (No Action).

Figure 11 illustrates the net new AM and PM peak hour trips with the Proposed Action.

With the Proposed Action, the overall campus the volumes in the study area reduced. Certain driveways are projected to see increases in traffic based on the locations of new buildings and certain driveways are projected to see decreases in traffic based on buildings being removed and activities being consolidated on the campus.

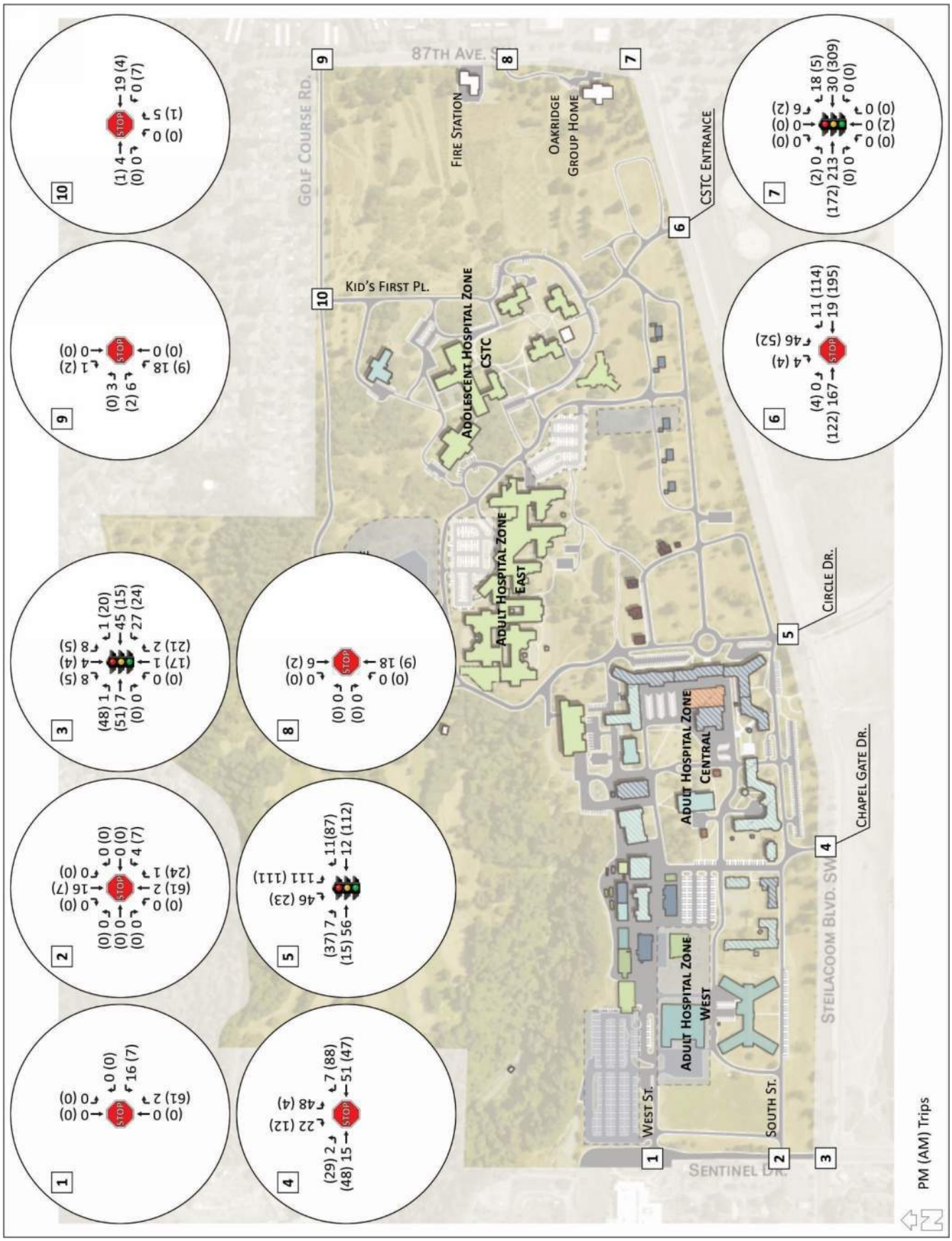


Figure 10: Existing Campus AM and PM Peak Hour Campus Trips

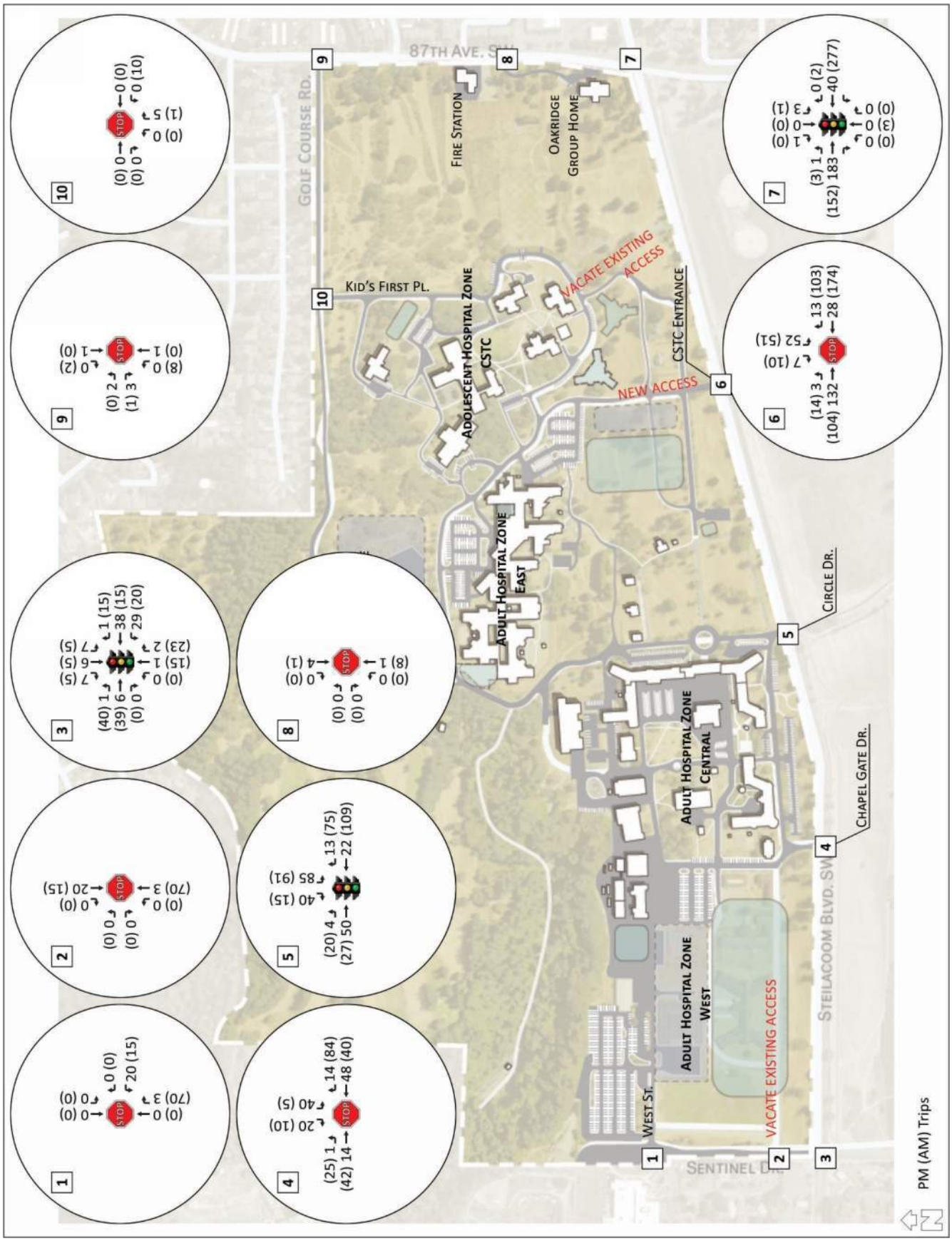


Figure 11: Net New AM and PM Peak Hour Campus Trips

Proposed Action

This section summarizes the future traffic conditions with built-out of the Proposed Action.

With the Proposed Action, the existing CSTC Entrance is proposed to be relocated to the east on Steilacoom Blvd. SW at roughly midway between the existing Circle Dr. intersection and 87th Ave. SW. Additionally, the existing South St. driveway off Sentinel Dr. SW would be closed.

Traffic Volumes

Future AM and PM peak hour traffic volumes with the Proposed Action were forecast by adding the net new trips generated with the proposal to the future No Action volumes. The future AM and PM peak hour traffic volumes with the Proposed Action are illustrated in Figure 12.

Level of Service

Intersection Level of Service

Table 8 summarizes the future no action study intersection LOS.

Future with-Project study intersection level-of-service is summarized in Table 14.

Table 14: Proposed Action AM and PM Peak Hour Intersection Level-of-Service

Intersection	Control	AM Peak Hour				PM Peak Hour			
		No Action		Proposed Action		No Action		Proposed Action	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Sentinel Dr. / West St.	WB Stop	C	19.1	C	20.0	B	11.3	B	11.3
Sentinel Dr. / South St.	WB Stop	C	18.8	Closed		B	10.8	Closed	
Farwest Dr. / Steilacoom Blvd.	Signal	D	36.9	D	36.0	D	41.5	D	41.7
Chapel Gate Dr. / Steilacoom Blvd.	SB Stop	C	18.3	C	19.9	F	60.1	F	51.1
Circle Dr. / Steilacoom Blvd.	Signal	A	5.3	A	5.1	B	14.4	B	14.5
CSTC Entrance / Steilacoom Blvd.	SB Stop	F	100	F	94.1	F	74.8	F	83.6
87th Ave. / Steilacoom Blvd.	Signal	B	19.3	B	19.3	C	21.8	C	21.8
87th Ave. / Oakridge Group Home	EB Stop	B	11.8	B	11.7	B	10.4	B	10.4
87th Ave. / Golf Course Rd.	EB Stop	B	11.7	B	11.7	B	11.3	B	11.1
Kids First Pl. / Golf Course Rd.	NB Stop	A	8.4	A	8.3	A	8.5	A	8.4

The study intersections are forecast to operate at LOS D or better and satisfy the City of Lakewood's level-of-service threshold, except the Chapel Gate Drive and CSTC Entrance driveways on Steilacoom Blvd SW.

- In the AM peak hour, the Chapel Gate Dr. stop-controlled approach to Steilacoom Blvd. SW is calculated to operate at LOS C (No Action) and LOS C (Proposed Action). In the PM peak hour, the approach is calculated to operate at LOS F (No Action) and LOS F (Proposed Action).
- In the AM peak hour, the CSTC Entrance stop-controlled approach to Steilacoom Blvd. SW is calculated to operate at LOS F (No Action) and LOS F (Proposed Action). In the PM peak hour, the approach is calculated to operate at LOS F (No Action) and LOS F (Proposed Action).

Consolidation of services on the campus, even with the expansion results in reducing the number of trips generated and vehicle delays at the West Street, South Street, Chapel Gate Drive and Circle Drive driveways.

Build-out of the proposed WSH East Zone and expansion of services in the CSTC Zone increase the number of trips generated and vehicle delays at the CSTC Entrance and Kids First Place driveways.

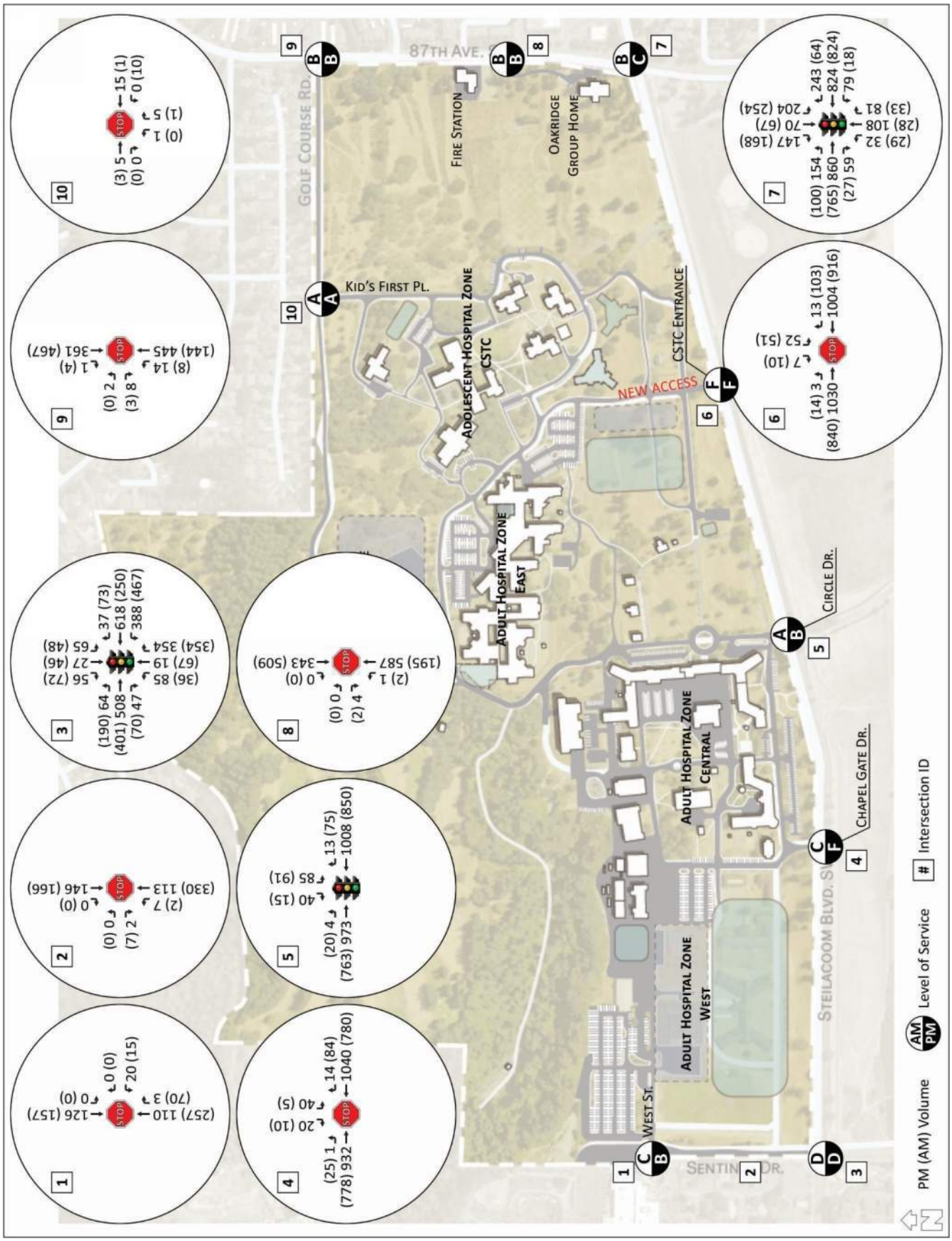


Figure 12: Future Proposed Action AM and PM Peak Hour Traffic Volumes

Arterial Level-of-Service

Table 15 summarizes the future Proposed Action peak hour arterial level-of-service on Steilacoom Blvd SW. The future arterial volumes on Steilacoom Blvd SW in the vicinity of the campus satisfies the volume-to-capacity threshold from the City of Lakewood.

Table 15: Proposed Action Arterial Level-of-Service on Steilacoom Blvd SW

Direction	Capacity[1]	No Action V/C	Action Vol.[2]	Action V/C
Eastbound	1,825	0.65	1,145	0.63
Westbound	1,825	0.63	1,150	0.63

1. City of Lakewood Comprehensive Plan Final EIS – June 2000
2. Maximum PM peak hour volume in one direction

With the Proposed Action, the volumes on Steilacoom Blvd SW and corresponding volume-to-capacity ratios are less than in the No Action conditions.

Vehicle Queuing (Stacking)

Vehicle queues were computed using the HCM 2010 95th-percentile queue equations to evaluate future vehicle queue impacts around the campus. Table 16 summarizes the queue output.

Table 16: Proposed Action Steilacoom Blvd SW Queues

Intersection	Mvmt.	AM Peak Hour			PM Peak Hour			Storage (feet)
		Q-V/L[1]	Q-feet[2]	V/C	Q-V/L[1]	Q-feet[2]	V/C	
Farwest Dr. / Steilacoom Blvd.	WB L	21.7	545	0.94	13.0	325	0.98	200
	WB T	7.6	190	0.29	14.4	360	0.54	1,380
	WB TR	7.7	195	0.29	14.7	370	0.54	1,380
	SB L	2.8	70	0.69	3.9	100	0.50	125
	SB TR	7.5	190	0.68	5.1	130	0.69	140
Chapel Gate Dr. / Steilacoom Blvd.	SB	0.2	5	0.06	2.0	50	0.45	
Circle Dr. / Steilacoom Blvd.	EB LT	4.3	110	0.41	11.5	290	0.63	1,000
	EB T	3.9	100	0.46	10.7	270	0.67	1,000
	WB T	5.0	125	0.51	11.5	290	0.67	1,250
	WB TR	5.1	130	0.51	11.9	300	0.67	1,250
	SB LT	1.8	45	0.42	2.6	65	0.19	25
CSTC Entrance / Steilacoom Blvd.	SB	3.5	90	0.68	3.0	75	0.61	
87th Ave. / Steilacoom Blvd.	EB L	4.2	105	0.78	7.1	180	0.80	200
	EB T	9.4	235	0.50	11.7	295	0.58	1,550
	EB TR	9.7	240	0.50	11.9	300	0.58	1,550
	SB L	8.9	225	0.73	2.6	65	0.60	125
	SB TR	2.0	50	0.22	2.1	55	0.22	550
	SB R	5.4	135	0.63	4.7	120	0.52	250

3. queue expressed as vehicles per lane
4. queue lengths are converted to fee with approximately 25 feet per vehicle and are rounded to the nearest multiple of "5"

The 95th-percentile queues are noticeable, but the intersection and driveway spacing on Steilacoom Blvd SW are more than sufficient to support the computed queues.

- The westbound left turn queue on Steilacoom Blvd. SW approaching Farwest Dr. SW is computed to exceed the 200-foot storage pocket in both the AM and PM peak hours, by up to 345 feet. Compared to the No Action condition, the Proposed Action queues are similar. With the Proposed Action, the peak hour westbound left turn V/C ratios are greater than 0.90 suggesting that the left turn movement is

nearing capacity. Overall, the westbound approach queues, overall, do not extend into the adjacent Chapel Game Dr. intersection.

- The southbound queue at Chapel Gate Dr. approaching Sentinel Dr. SW is computed to be up to 50 feet.
- The southbound queue at Circle Dr. approaching Steilacoom Blvd. SW is computed to be 65 feet. The Circle Dr. and internal Front St. intersection is located approximately 25 feet north of the signalized intersection. Peak hour queues are forecast to continue to extend through the internal intersection from Steilacoom Blvd. SW.
- The southbound queue at CSTC Entrance approaching Sentinel Dr. SW is computed to be up to 90 feet.
- The eastbound left turn queue on Steilacoom Blvd. SW approaching 87th Ave. SW is computed to fit within the 200-foot storage pocket in both the AM and PM peak hours.
- The southbound left turn queue on 87th Ave. SW approaching Steilacoom Blvd. SW is computed to exceed the 125-foot storage pocket in the AM peak hour, by 100 feet or four vehicle lengths.

Traffic Circulation

- Figure 13 shows the shows the major traffic circulation routes with the Proposed Action. Changes include deemphasizing use of Circle Dr. and Golf Course Rd, closure of the South St. driveway off Sentinel Dr. SW and enhancing use of the Chapel Gate Dr. and relocated CSTC Entrance driveways.
- Figure 14 shows the patient admissions and discharge route to and from the WSH campus with the Proposed Action. Changes include ingress and egress proposed from the relocated CSTC Entrance to deemphasize use of the Circle Dr.
- It is not yet clear whether the on-campus shuttle service will change or continue with the Proposed Action; and therefore, no new routing is being proposed.
- Figure 15 shows the primary service vehicle routes to the WSH campus with the Proposed Action. The major service vehicle routes are intended to shift to the periphery of the campus via Sentinel Dr. SW.

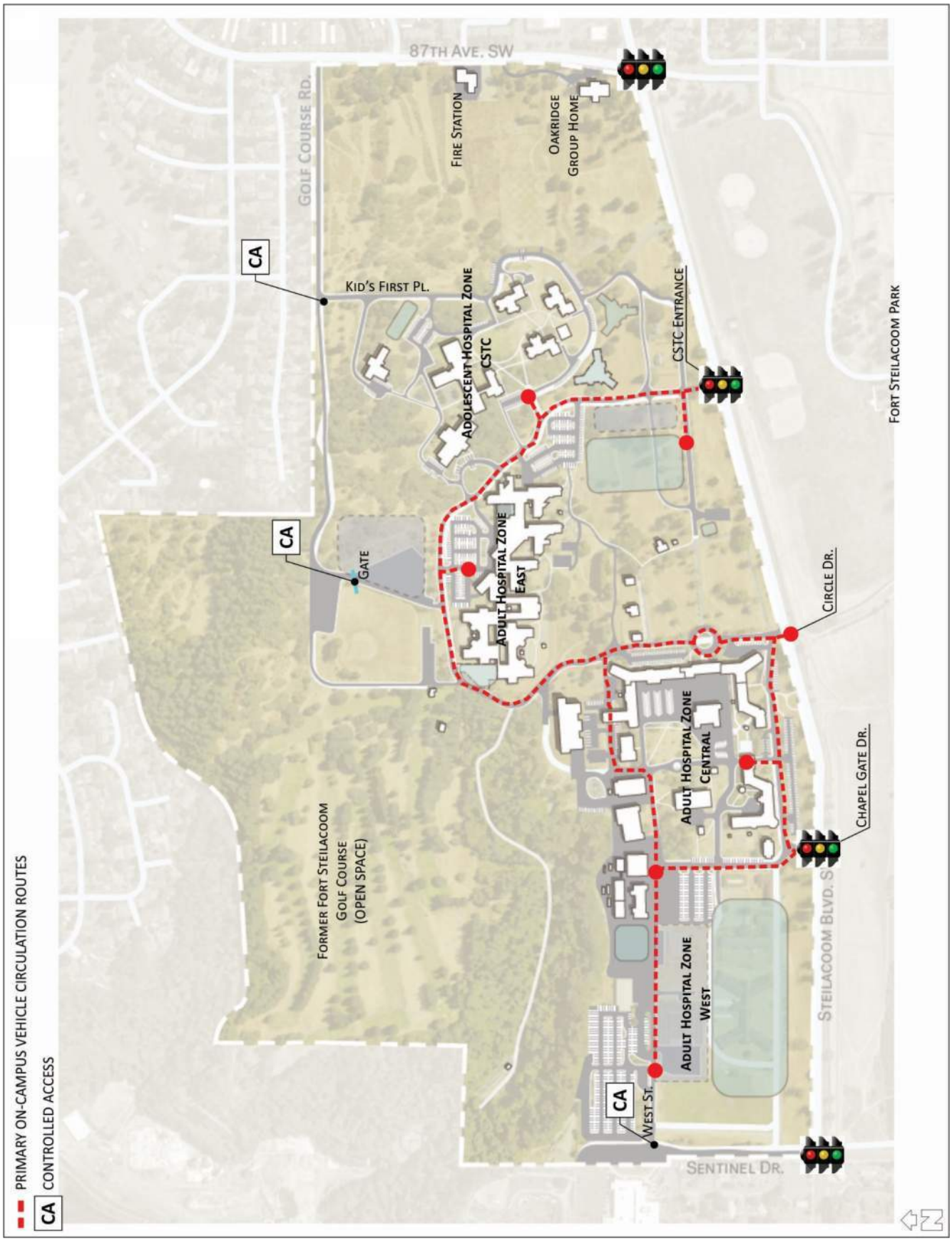


Figure 13: Proposed Action On-Campus Primary Vehicle Circulation Routes

Figure 14: Proposed Action Patient Admissions and Discharge Route

Figure 15: Proposed Action WSH Primary Service Vehicle Routes

Safety

The overall future crash frequency is anticipated to be proportional to the forecasted changes in the traffic volumes and patterns around the site.

Review of the 2013-2017 crash history identified no reported crashes on 87th Ave. SW at Golf Course Rd. or on Sentinel Dr. SW at West St. or South St. At the main campus accesses off Steilacoom Blvd. SW, there were no trends or crash incidents to suggest any significant safety issue(s).

With the Proposed Action, crash incidents at the three campus driveways off Steilacoom Blvd. SW. on were reviewed in further detail to provide recommendations for enhancing access to the campus off Steilacoom Blvd SW. Reported incidents at the main campus accesses on Steilacoom Blvd. SW include:

Chapel Gate Drive
- 2 lefts-out of Chapel Gate
- 1 rear-end on Steilacoom
- 1 vehicle strikes deer on Steilacoom Blvd SW

Circle Drive
- 1 left-in to Circle Drive
- 2 left-out of Circle Drive
- 4 rear-ends on Steilacoom
- 1 right-in strikes tree at Circle Drive

CSTC Entrance
- 1 left-out of CSTC Entrance

Most of the left-turn collisions appear to involve service or delivery vehicles, classified in the collision reports as "*pickup, panel truck, or vannette under 10,000 lb*" maneuvers into or out of the driveways.

To reduce the campus' traffic impacts on 87th Ave. SW and Sentinel Dr., DSHS is proposing to enhance access to the main campus off Steilacoom Blvd. SW. Enhancement-improvements options to consider include:

1A. Widen the Steilacoom Blvd. SW to accommodate left-turn pockets for vehicles making left-turns into the campus. Turn pockets, allow left turning vehicles to queue separate from the major eastbound traffic flow while drivers wait for a gap in the opposing traffic to turn into the campus. The left turn pockets would reduce the rear-end crash potential on Steilacoom Blvd. SW.

1B. Add a center lane to Steilacoom Blvd. SW. This may include a center turn lane with medians. A center lane allows vehicles turning left from the site to enter the center lane and accelerate to merge into the eastbound traffic flow. This movement option can reduce delays and queue impacts onsite and it is generally safer for the driveway only have to discern one direction of traffic at a time.

2. Signalize the Chapel Gate Dr. and CSTC Entrance. Signalizing the driveways creates more direct access to the campus and allows for improved exiting traffic flows. By signalizing the driveways, the existing Circle Dr. signal could be removed, and the driveway could further be restricted to right-turns in and right-turns out only. Signal warrants are discussed in more detail later in this report.

It was understood that there were potential historical impacts along Steilacoom Blvd. SW that may limit the ability to widening the roadway. If viable, a widening the roadway with a center lane (Option 1B) allows for both left turn pockets and acceleration lanes.

The signals option (Option 2) will stop traffic on Steilacoom Blvd. SW combined with left turn pockets (Option 1A), would further enhance access to the campus. A drawback of the additional traffic signals is that they will increase the travel time on Steilacoom Blvd. SW.

Non-Motorized and Transit Conditions

On-campus pedestrian facilities will be upgraded to support campus activities.

As noted above the City of Lakewood and Town of Steilacoom are planning non-motorized improvements on Steilacoom Blvd. SW. The City of Lakewood's scope and timing for constructions of improvements on Steilacoom Blvd. SW including curb, gutter, sidewalk, sharrows, turn lanes, street lighting, drainage and overlay is undefined.

The Proposed Action is not forecast to change or adversely impact the current transit network.

Recommendations

The recommendations based on the Proposed Action are similar to those for the No Action.

- Circulation. Improve the campus's internal circulation by increasing the spacing between internal roadways and intersections and driveways.
- Access. Improve access to the campus by enhancing traffic flow to and from Steilacoom Blvd. SW via:
  - Install traffic control signals at Chapel Gate Dr. and at CSTC Entrance, with the intent to concentrate more traffic to these campus accesses and reduce traffic impacts on Sentinel Dr., 87th Ave. SW and Golf Course Rd. Traffic control signal installation requires certain "warrants" to be satisfied and these are discussed later in this document.
  - Widen Steilacoom Blvd. SW to provide left turn pockets and acceleration lanes to improve left turn maneuvers to and from the campus. Left turn lanes would enhance site access by providing a "pocket" off of the mainline for vehicles to queue in before making a left turn to the campus. Acceleration lanes, in the form of a center turn lane, would allow staged left turn maneuvers (left turn out of campus to turn lane to merge with opposing traffic volume). Widening requires right-of-way acquisition.
  - Remove the existing signal at Circle Drive and Steilacoom Blvd SW, and repurposing the intersection to be right-in and right-out only restricted. This will decentralize access at Circle Dr. and refocus traffic to the Chapel Gate Dr. and CSTC Entrance driveways.
  - An alternative to a traffic signal is a roundabout. Roundabouts do not create fixed stops and do not have adopted "warrant" criteria. Roundabouts do involve additional right-of-way.
  - Close or add gates (restrictions) to existing main campus access off Sentinel Dr. and Golf Course Rd. West St. could be gated and restricted for service vehicles only. Kids First Pl. could also be gated, for fire and emergency vehicle access to the site only. Also, vehicle access to campus' other secondary entrances off Golf Course Rd. could be restricted. By restricting or eliminating these access, the campus traffic would be forced to access the site off Steilacoom Blvd SW, which would mitigate neighborhood concerns with campus traffic impacting the high school and residents.
  - The Proposed Action includes new buildings nearer to the Chapel Gate Dr. and CSTC Entrance where enhanced accessibility would allow support improvements to driveway traffic control off Steilacoom Blvd SW.
- Support. DSHS should provide their support for non-motorized and turn lane improvements on Steilacoom Blvd. SW, planned by both the Town of Steilacoom and City of Lakewood. The Proposed Action to support improvements by the Town of Steilacoom and City of Lakewood.
- Parking. Consolidate, mark, pave and manage parking areas to reduce parking sprawl on campus. Designate areas for staff based on the location and function of employees. The Proposed Action is consolidating parking and parking designations will be addressed with building-out of the site.

Signal Warrants

The MUTCD, published by the FHWA, includes the national guidance for supporting the installation of traffic control signals. The MUTCD outlines criteria to support the installation of a new traffic signal.

This following evaluates traffic volume conditions based on MUTCD Warrant 1, Eight-Hour Vehicular Volume, Warrant 2, Four-Hour Vehicular Volume, and Warrant 3, Peak Hour, as applied to the Chapel Gate Dr., Circle Dr. and CSTC Entrance driveways. The warrants were developed using the daily traffic volume data.

This analysis assumes that the volumes generated to/from the Circle Dr. intersection with Steilacoom Blvd. SW are reduced and that the driveway is restricted to right-in/right-out movements only, consistent with the recommendations in the previous section. Reducing the traffic impacts at Circle Dr., shifts more traffic to the Chapel Gate Dr. and CSTC Entrance driveways. The peak hour volume shift is illustrated in Figure 16.

Warrant 1, Eight-Hour Vehicular Volume

The eight-hour vehicular volume warrant criteria and analysis is provided in the charts included in Tables 17-19. The analysis incorporates conditions assuming the 85th-percentile vehicle speeds on Steilacoom Blvd. SW are above 40 mph. The analysis shows that with the forecasted conditions the warrant criteria are not met for eight consecutive hours of a typical day.

Warrant 2, Four-Hour Vehicular Volume

The four-hour vehicular volumes are evaluated Figure 18. The analysis incorporates conditions assuming the 85th-percentile vehicle speeds on Steilacoom Blvd. SW are above 40 mph. The analysis shows that with the forecasted conditions the four-hour warrant criteria are met at the Chapel Gate Dr. campus driveway, using the 70% volume conditions.

The warrant criteria are met for only three consecutive hours at the CSTC Entrance campus driveway.

Warrant 3, Peak Hour

The vehicular volume portion of the peak hour warrant is evaluated in Figure 19. The analysis incorporates conditions assuming the 85th-percentile vehicle speeds on Steilacoom Blvd. SW are above 40 mph. The analysis shows that with the forecasted conditions the peak hour volume portion of the warrant is satisfied at both the Chapel Gate Dr. and the CSTC Entrance campus driveways using the 100% volume conditions.

The peak hour warrant conditions are unique and also require analysis for excessive delays. The delay criteria of the warrant will not be satisfied based on the forecasted traffic conditions.

Warrant Conclusions

Warrant 2, the four-hour vehicular volumes warrant is nearly satisfied for the future conditions. Additional campus access restrictions to further limit use of Golf Course Rd. and Sentinel Dr. SW to access to the campus could allow the traffic conditions to support the warrant criteria.

The four-lane cross-section on Steilacoom Blvd. SW could support the signalized access controls to increase safety for left turning vehicles along this section of the roadway. Additionally, while the pedestrian volumes were low, the addition of signalized access, would allow additional controlled crossings of Steilacoom Blvd. SW to Fort Steilacoom Park to promote the park's usage.

A LOS of service analysis with traffic control signals at Chapel Gate Dr. and CSCT Entrance driveways is provided as Table 20.

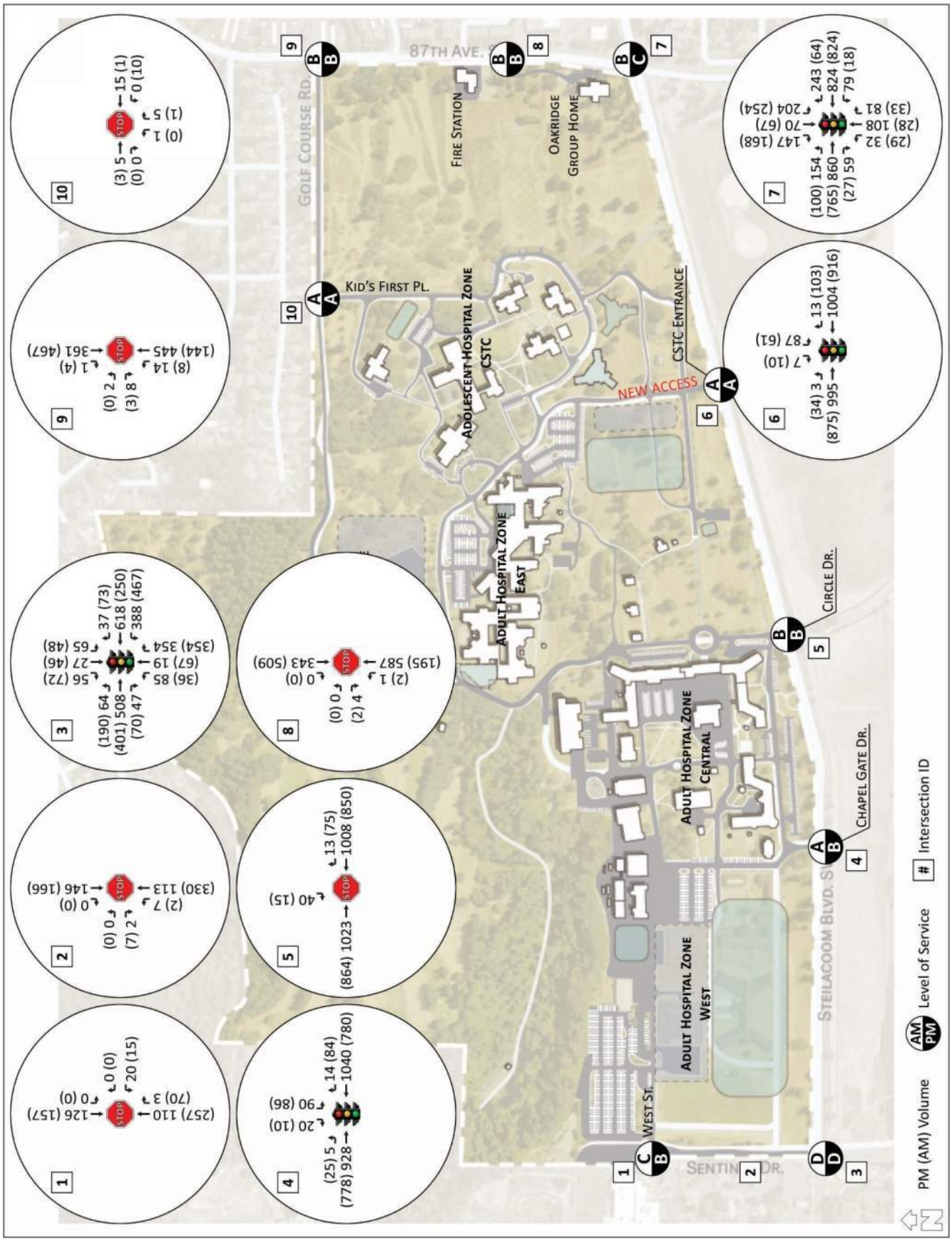


Figure 16: 2030 Proposed Action – Volume Reduction at Circle Dr.

Table 17: 2030 Proposed Action Warrant 1 – Chapel Gate Dr.

	Condition A			Condition A			Condition A			Condition A		
	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met
	100%	100%	Y/N?	80%	80%	Y/N?	70%	70%	Y/N?	56%	56%	Y/N?
	150	600		120	480		105	420		84	336	
12 AM	0%	16%	N	0%	20%	N	0%	23%	N	0%	29%	N
1 AM	0%	8%	N	0%	10%	N	0%	12%	N	0%	15%	N
2 AM	0%	7%	N	0%	8%	N	0%	9%	N	0%	12%	N
3 AM	0%	11%	N	0%	13%	N	0%	15%	N	0%	19%	N
4 AM	4%	21%	N	5%	26%	N	6%	29%	N	8%	37%	N
5 AM	6%	83%	N	7%	103%	N	8%	118%	N	10%	148%	N
6 AM	30%	167%	N	38%	209%	N	43%	239%	N	54%	298%	N
7 AM	23%	265%	N	29%	331%	N	33%	379%	N	41%	473%	N
8 AM	14%	212%	N	18%	265%	N	20%	303%	N	26%	379%	N
9 AM	26%	200%	N	32%	250%	N	37%	286%	N	46%	358%	N
10 AM	20%	180%	N	25%	225%	N	29%	257%	N	36%	322%	N
11 AM	34%	202%	N	43%	253%	N	49%	289%	N	61%	362%	N
12 PM	50%	217%	N	63%	271%	N	72%	310%	N	90%	387%	N
1 PM	46%	209%	N	57%	261%	N	66%	298%	N	82%	373%	N
2 PM	70%	264%	N	88%	330%	N	100%	377%	Y	125%	472%	Y
3 PM	136%	266%	Y	170%	332%	Y	195%	379%	Y	243%	474%	Y
4 PM	100%	287%	Y	125%	359%	Y	143%	410%	Y	179%	513%	Y
5 PM	42%	294%	N	52%	367%	N	59%	420%	N	74%	525%	N
6 PM	19%	218%	N	23%	272%	N	27%	311%	N	33%	388%	N
7 PM	17%	184%	N	22%	230%	N	25%	262%	N	31%	328%	N
8 PM	9%	152%	N	11%	190%	N	12%	217%	N	15%	272%	N
9 PM	10%	109%	N	13%	136%	N	14%	156%	N	18%	195%	N
10 PM	33%	79%	N	41%	99%	N	47%	113%	N	59%	142%	N
11 PM	30%	40%	N	38%	50%	N	43%	57%	N	54%	71%	N
	Condition B			Condition B			Condition B			Condition B		
	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met
	100%	100%	Y/N?	80%	80%	Y/N?	70%	70%	Y/N?	56%	56%	Y/N?
	75	900		60	720		53	630		42	504	
12 AM	0%	11%	N	0%	14%	N	0%	16%	N	0%	19%	N
1 AM	0%	6%	N	0%	7%	N	0%	8%	N	0%	10%	N
2 AM	0%	4%	N	0%	5%	N	0%	6%	N	0%	8%	N
3 AM	0%	7%	N	0%	9%	N	0%	10%	N	0%	13%	N
4 AM	9%	14%	N	11%	17%	N	12%	20%	N	15%	25%	N
5 AM	11%	55%	N	14%	69%	N	16%	79%	N	20%	99%	N
6 AM	60%	111%	N	75%	139%	N	85%	159%	N	108%	199%	Y
7 AM	46%	177%	N	57%	221%	N	65%	253%	N	82%	316%	N
8 AM	29%	141%	N	36%	177%	N	41%	202%	N	51%	252%	N
9 AM	52%	134%	N	65%	167%	N	73%	191%	N	92%	238%	N
10 AM	40%	120%	N	50%	150%	N	57%	172%	N	72%	215%	N
11 AM	69%	135%	N	86%	169%	N	97%	193%	N	123%	241%	Y
12 PM	100%	145%	Y	125%	181%	Y	142%	207%	Y	179%	258%	Y
1 PM	92%	139%	N	115%	174%	Y	130%	199%	Y	164%	249%	Y
2 PM	140%	176%	Y	176%	220%	Y	199%	252%	Y	251%	315%	Y
3 PM	272%	177%	Y	340%	221%	Y	385%	253%	Y	486%	316%	Y
4 PM	201%	192%	Y	251%	239%	Y	284%	274%	Y	358%	342%	Y
5 PM	83%	196%	N	104%	245%	Y	118%	280%	Y	148%	350%	Y
6 PM	37%	145%	N	47%	181%	N	53%	207%	N	67%	259%	N
7 PM	34%	122%	N	43%	153%	N	49%	175%	N	61%	219%	N
8 PM	17%	101%	N	22%	127%	N	24%	145%	N	31%	181%	N
9 PM	20%	73%	N	25%	91%	N	28%	104%	N	36%	130%	N
10 PM	66%	53%	N	82%	66%	N	93%	76%	N	118%	95%	N
11 PM	60%	26%	N	75%	33%	N	85%	38%	N	108%	47%	N

Assumes Circle Dr. volumes are reduced, and driveway is restricted to rights-in and rights-out

Condition A (100%) criteria satisfied if met for 8-hours of an average day -or-
Condition B (100%) criteria satisfied if met for 8-hours of an average day -or-
Conditions A & B (80%) criteria satisfied if met for 8-hours of an average day

WARRANT MET: NO

Condition A (70%) criteria satisfied if met for 8-hours of an average day -or-
Condition B (70%) criteria satisfied if met for 8-hours of an average day -or-
Conditions A & B (56%) criteria satisfied if met for 8-hours of an average day
* 85th percentile speed on the Steilacoom Blvd. SW exceeds 40 mph
WARRANT MET: NO

Table 18: 2030 Proposed Action Warrant 1 – Circle Dr.

	Condition A			Condition A			Condition A			Condition A		
	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met
	100%	100%	Y/N?	80%	80%	Y/N?	70%	70%	Y/N?	56%	56%	Y/N?
	150	600		120	480		105	420		84	336	
12 AM	1%	17%	N	2%	22%	N	2%	25%	N	3%	31%	N
1 AM	0%	9%	N	1%	11%	N	1%	12%	N	1%	15%	N
2 AM	1%	7%	N	2%	9%	N	2%	10%	N	3%	12%	N
3 AM	2%	12%	N	3%	15%	N	3%	18%	N	4%	22%	N
4 AM	1%	23%	N	2%	28%	N	2%	33%	N	2%	41%	N
5 AM	6%	89%	N	7%	112%	N	8%	128%	N	10%	160%	N
6 AM	16%	192%	N	20%	241%	N	23%	275%	N	29%	344%	N
7 AM	17%	285%	N	21%	357%	N	24%	408%	N	30%	510%	N
8 AM	5%	222%	N	6%	278%	N	7%	317%	N	9%	396%	N
9 AM	5%	206%	N	7%	258%	N	8%	295%	N	10%	368%	N
10 AM	5%	187%	N	6%	234%	N	7%	267%	N	9%	334%	N
11 AM	9%	213%	N	11%	266%	N	12%	304%	N	15%	381%	N
12 PM	12%	232%	N	15%	289%	N	17%	331%	N	21%	413%	N
1 PM	10%	219%	N	13%	274%	N	15%	313%	N	19%	391%	N
2 PM	19%	288%	N	24%	360%	N	27%	412%	N	34%	515%	N
3 PM	28%	283%	N	35%	353%	N	40%	404%	N	50%	505%	N
4 PM	19%	299%	N	24%	373%	N	27%	427%	N	34%	533%	N
5 PM	8%	300%	N	10%	375%	N	12%	428%	N	15%	535%	N
6 PM	9%	224%	N	11%	280%	N	12%	320%	N	15%	400%	N
7 PM	2%	185%	N	3%	232%	N	3%	265%	N	4%	331%	N
8 PM	3%	155%	N	3%	193%	N	4%	221%	N	5%	276%	N
9 PM	2%	112%	N	3%	140%	N	3%	160%	N	4%	200%	N
10 PM	12%	97%	N	15%	121%	N	17%	138%	N	21%	172%	N
11 PM	12%	47%	N	15%	58%	N	18%	67%	N	22%	83%	N
	Condition B			Condition B			Condition B			Condition B		
	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met
	100%	100%	Y/N?	80%	80%	Y/N?	70%	70%	Y/N?	56%	56%	Y/N?
	105	420		84	336		53	630		42	504	
12 AM	3%	12%	N	4%	15%	N	4%	17%	N	5%	21%	N
1 AM	1%	6%	N	1%	7%	N	1%	8%	N	1%	10%	N
2 AM	3%	5%	N	4%	6%	N	4%	7%	N	5%	8%	N
3 AM	5%	8%	N	6%	10%	N	6%	12%	N	8%	15%	N
4 AM	2%	15%	N	3%	19%	N	3%	22%	N	4%	27%	N
5 AM	12%	60%	N	15%	75%	N	17%	85%	N	21%	106%	N
6 AM	33%	128%	N	41%	160%	N	46%	183%	N	58%	229%	N
7 AM	33%	190%	N	42%	238%	N	47%	272%	N	60%	340%	N
8 AM	10%	148%	N	12%	185%	N	14%	211%	N	18%	264%	N
9 AM	11%	137%	N	14%	172%	N	15%	196%	N	20%	245%	N
10 AM	10%	125%	N	13%	156%	N	14%	178%	N	18%	223%	N
11 AM	17%	142%	N	22%	178%	N	25%	203%	N	31%	254%	N
12 PM	23%	154%	N	29%	193%	N	33%	220%	N	41%	276%	N
1 PM	21%	146%	N	26%	182%	N	29%	209%	N	37%	261%	N
2 PM	38%	192%	N	48%	240%	N	54%	275%	N	68%	343%	N
3 PM	57%	188%	N	71%	236%	N	80%	269%	N	101%	337%	Y
4 PM	38%	199%	N	48%	249%	N	54%	284%	N	69%	356%	N
5 PM	16%	200%	N	20%	250%	N	23%	286%	N	29%	357%	N
6 PM	17%	149%	N	21%	187%	N	24%	213%	N	30%	267%	N
7 PM	4%	123%	N	5%	154%	N	6%	176%	N	8%	220%	N
8 PM	5%	103%	N	7%	129%	N	8%	147%	N	10%	184%	N
9 PM	5%	75%	N	6%	93%	N	6%	107%	N	8%	133%	N
10 PM	24%	64%	N	30%	80%	N	34%	92%	N	43%	115%	N
11 PM	25%	31%	N	31%	39%	N	35%	44%	N	44%	55%	N

Assumes Circle Dr. volumes are reduced, and driveway is restricted to rights-in and rights-out

Condition A (100%) criteria satisfied if met for 8-hours of an average day -or-
Condition B (100%) criteria satisfied if met for 8-hours of an average day -or-
Conditions A & B (80%) criteria satisfied if met for 8-hours of an average day

WARRANT MET: NO

Condition A (70%) criteria satisfied if met for 8-hours of an average day -or-
Condition B (70%) criteria satisfied if met for 8-hours of an average day -or-
Conditions A & B (56%) criteria satisfied if met for 8-hours of an average day
* 85th percentile speed on the Steilacoom Blvd. SW exceeds 40 mph
WARRANT MET: NO

Table 19: 2030 Proposed Action Warrant 1 – CSTS Entrance

	Condition A			Condition A			Condition B			Condition B		
	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met
	100%	100%	Y/N?	80%	80%	Y/N?	100%	100%	Y/N?	80%	80%	Y/N?
	150	600		120	480		75	900		60	720	
12 AM	0%	19%	N	0%	23%	N	0%	27%	N	0%	33%	N
1 AM	0%	9%	N	0%	11%	N	0%	12%	N	0%	16%	N
2 AM	0%	7%	N	0%	9%	N	0%	10%	N	0%	13%	N
3 AM	0%	14%	N	0%	17%	N	0%	20%	N	0%	25%	N
4 AM	0%	25%	N	0%	31%	N	0%	36%	N	0%	44%	N
5 AM	5%	96%	N	6%	120%	N	7%	137%	N	9%	172%	N
6 AM	21%	218%	N	26%	272%	N	30%	311%	N	37%	389%	N
7 AM	47%	306%	N	58%	382%	N	66%	437%	N	83%	546%	N
8 AM	20%	232%	N	25%	290%	N	28%	332%	N	35%	414%	N
9 AM	22%	212%	N	27%	265%	N	31%	303%	N	39%	379%	N
10 AM	21%	194%	N	26%	242%	N	30%	277%	N	37%	346%	N
11 AM	35%	224%	N	44%	280%	N	50%	320%	N	63%	399%	N
12 PM	43%	246%	N	54%	308%	N	62%	351%	N	78%	439%	N
1 PM	24%	229%	N	30%	286%	N	34%	327%	N	42%	409%	N
2 PM	79%	312%	N	98%	390%	N	112%	446%	Y	140%	558%	Y
3 PM	103%	300%	Y	129%	375%	Y	148%	428%	Y	185%	536%	Y
4 PM	54%	310%	N	67%	387%	N	77%	443%	N	96%	554%	N
5 PM	31%	306%	N	39%	382%	N	44%	437%	N	55%	546%	N
6 PM	26%	231%	N	32%	288%	N	37%	330%	N	46%	412%	N
7 PM	18%	187%	N	22%	233%	N	25%	267%	N	31%	333%	N
8 PM	16%	157%	N	19%	196%	N	22%	224%	N	28%	280%	N
9 PM	7%	115%	N	9%	144%	N	10%	164%	N	13%	206%	N
10 PM	63%	114%	N	79%	142%	N	90%	162%	N	113%	203%	Y
11 PM	51%	54%	N	63%	67%	N	72%	77%	N	90%	96%	N

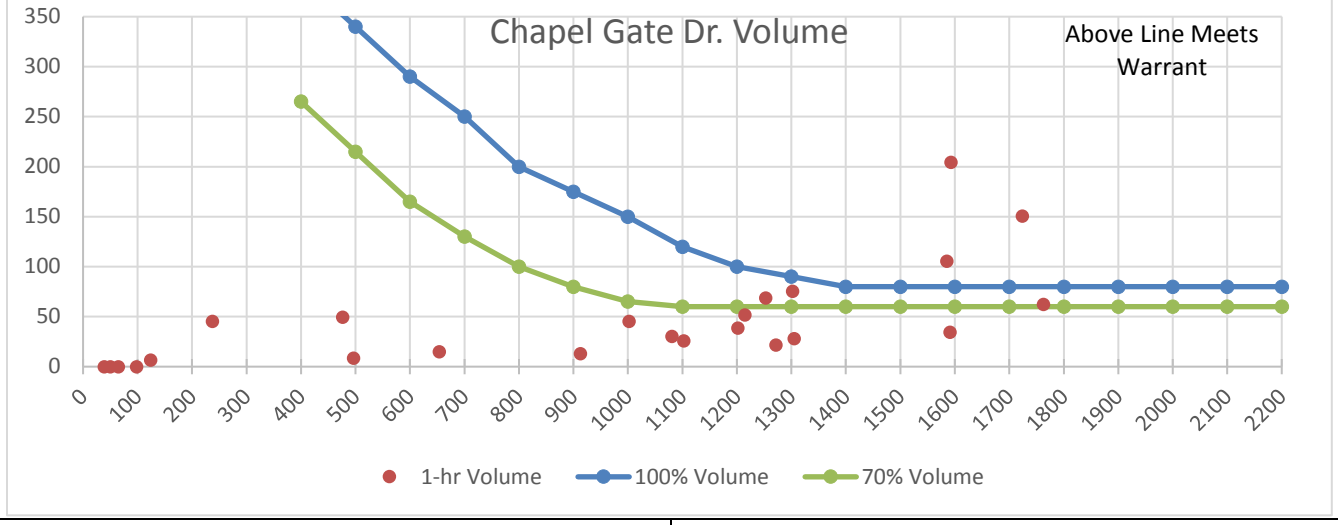
	Condition A			Condition A			Condition B			Condition B		
	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met	MINOR	MAJOR	Met
	70%	70%	Y/N?	56%	56%	Y/N?	70%	70%	Y/N?	56%	56%	Y/N?
	105	420		84	336		53	630		42	504	
12 AM	0%	12%	N	0%	15%	N	0%	18%	N	0%	22%	N
1 AM	0%	6%	N	0%	7%	N	0%	8%	N	0%	10%	N
2 AM	0%	5%	N	0%	6%	N	0%	7%	N	0%	9%	N
3 AM	0%	9%	N	0%	11%	N	0%	13%	N	0%	16%	N
4 AM	0%	17%	N	0%	21%	N	0%	24%	N	0%	30%	N
5 AM	5%	64%	N	6%	80%	N	7%	92%	N	9%	114%	N
6 AM	21%	145%	N	26%	182%	N	30%	208%	N	37%	259%	N
7 AM	47%	204%	N	58%	255%	N	66%	291%	N	83%	364%	N
8 AM	20%	155%	N	25%	193%	N	28%	221%	N	35%	276%	N
9 AM	22%	141%	N	27%	177%	N	31%	202%	N	39%	253%	N
10 AM	21%	129%	N	26%	162%	N	30%	185%	N	37%	231%	N
11 AM	35%	149%	N	44%	186%	N	50%	213%	N	63%	266%	N
12 PM	43%	164%	N	54%	205%	N	62%	234%	N	78%	293%	N
1 PM	24%	153%	N	30%	191%	N	34%	218%	N	42%	273%	N
2 PM	79%	208%	N	98%	260%	N	112%	298%	Y	140%	372%	Y
3 PM	103%	200%	Y	129%	250%	Y	148%	286%	Y	185%	357%	Y
4 PM	54%	207%	N	67%	258%	N	77%	295%	N	96%	369%	N
5 PM	31%	204%	N	39%	255%	N	44%	291%	N	55%	364%	N
6 PM	26%	154%	N	32%	192%	N	37%	220%	N	46%	275%	N
7 PM	18%	124%	N	22%	156%	N	25%	178%	N	31%	222%	N
8 PM	16%	105%	N	19%	131%	N	22%	149%	N	28%	187%	N
9 PM	7%	77%	N	9%	96%	N	10%	110%	N	13%	137%	N
10 PM	63%	76%	N	79%	95%	N	90%	108%	N	113%	135%	Y
11 PM	51%	36%	N	63%	45%	N	72%	51%	N	90%	64%	N

Assumes Circle Dr. volumes are reduced, and driveway is restricted to rights-in and rights-out

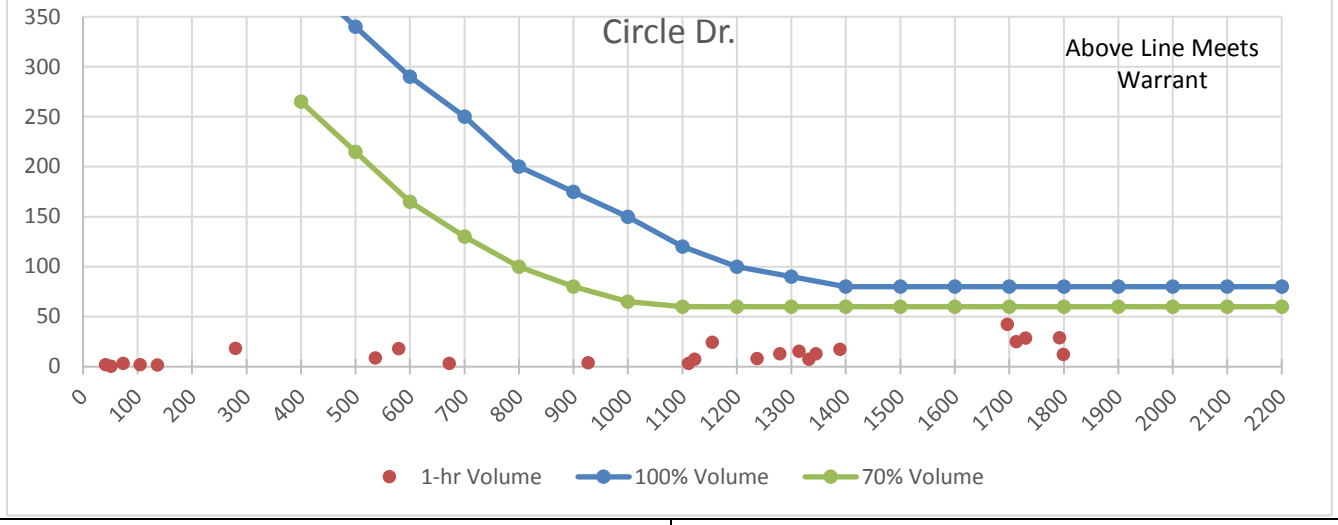
Condition A (100%) criteria satisfied if met for 8-hours of an average day -or-
Condition B (100%) criteria satisfied if met for 8-hours of an average day -or-
Conditions A & B (80%) criteria satisfied if met for 8-hours of an average day

WARRANT MET: NO

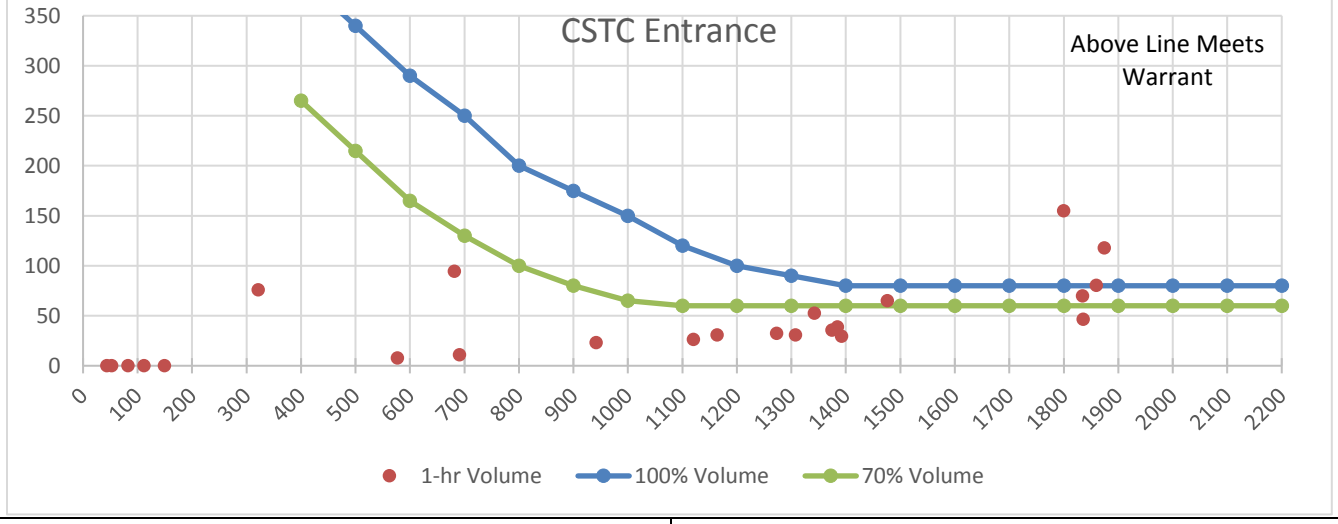
Condition A (70%) criteria satisfied if met for 8-hours of an average day -or-
Condition B (70%) criteria satisfied if met for 8-hours of an average day -or-
Conditions A & B (56%) criteria satisfied if met for 8-hours of an average day
* 85th percentile speed on the Steilacoom Blvd. SW exceeds 40 mph
WARRANT MET: NO



100% VOLUME WARRANT MET: NO	70% VOLUME WARRANT MET: YES

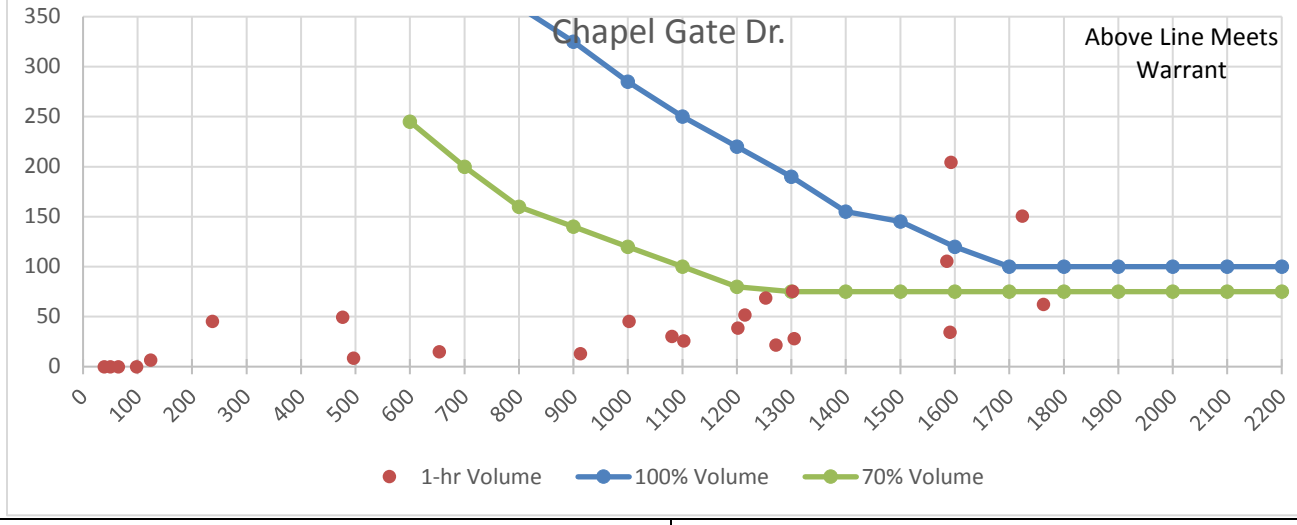


100% VOLUME WARRANT MET: NO	70% VOLUME WARRANT MET: NO

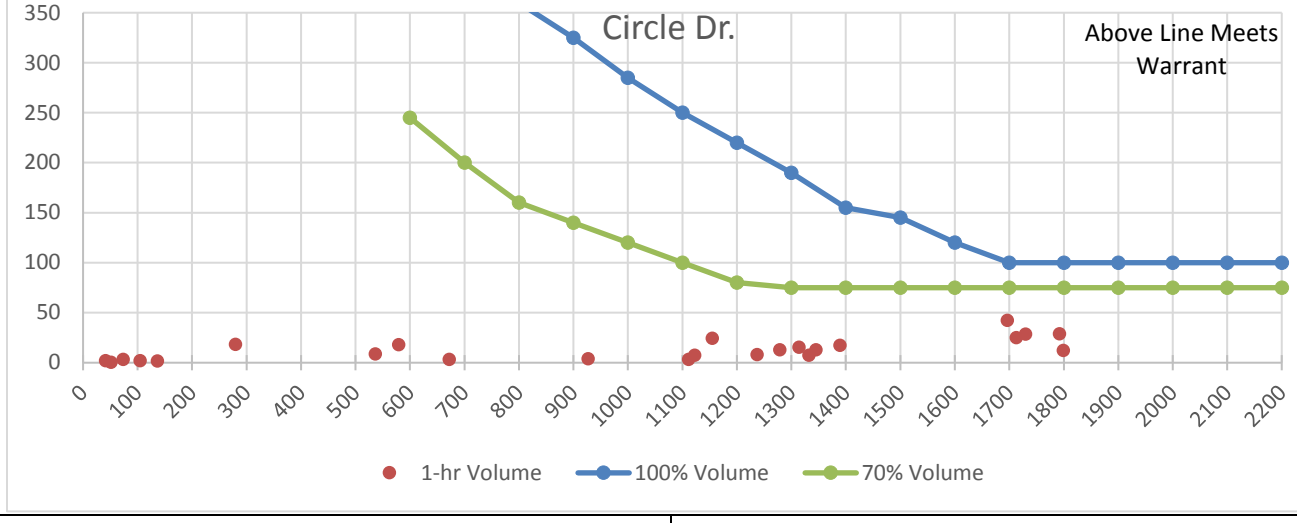


100% VOLUME WARRANT MET: NO	70% VOLUME WARRANT MET: NO

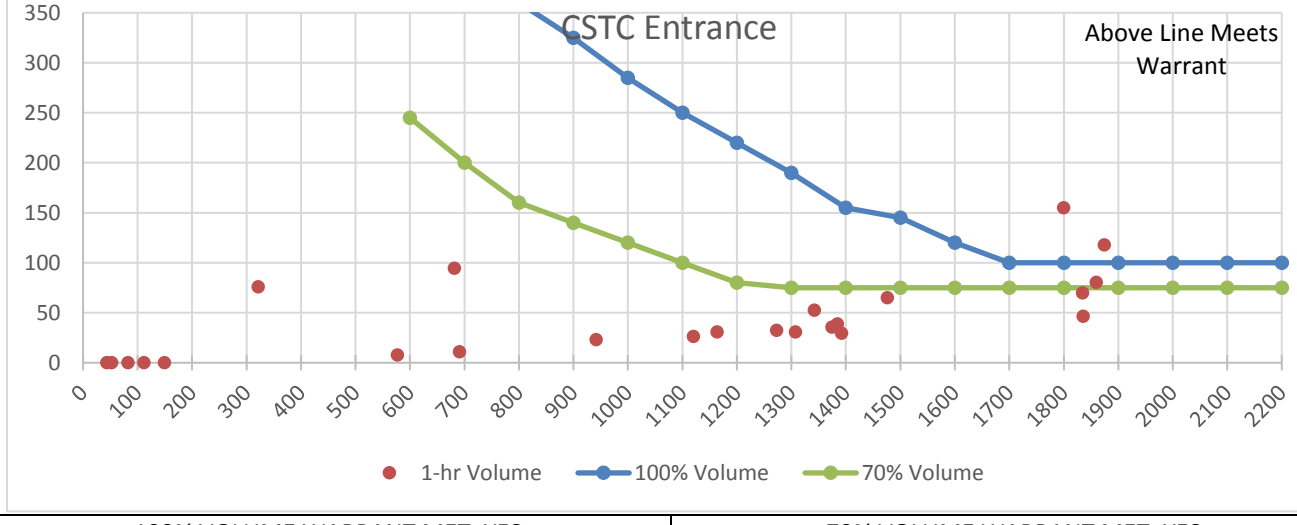
Figure 17: Four-Hour Vehicular Volume Warrant Analysis



100% VOLUME WARRANT MET: YES	70% VOLUME WARRANT MET: YES



100% VOLUME WARRANT MET: NO	70% VOLUME WARRANT MET: NO



100% VOLUME WARRANT MET: YES	70% VOLUME WARRANT MET: YES

Figure 18: Peak Hour Volume Warrant Analysis

Table 20: Proposed Action AM and PM Peak Hour Intersection Level-of-Service with Access Changes

Intersection	Control	AM Peak Hour				PM Peak Hour			
		Proposed Action		Access Change		Proposed Action		Access Change	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Sentinel Dr. / West St.	WB Stop	C	20.0	C	20.0	B	11.3	B	11.3
Sentinel Dr. / South St.	WB Stop	Closed		Closed		Closed		Closed	
Farwest Dr. / Steilacoom Blvd.	Signal	D	36.0	D	36.0	D	41.7	D	40.1
Chapel Gate Dr. / Steilacoom Blvd.	Signal	C	19.9	A	4.9	F	51.1	B	11.0
Circle Dr. / Steilacoom Blvd.	SB Stop	A	5.1	B	12.3	B	14.5	B	13.0
CSTC Entrance / Steilacoom Blvd.	Signal	F	94.1	A	4.7	F	83.6	A	4.8
87th Ave. / Steilacoom Blvd.	Signal	B	19.3	B	19.3	C	21.8	C	21.8
87th Ave. / Oakridge Group Home	EB Stop	B	11.7	B	11.7	B	10.4	B	10.4
87th Ave. / Golf Course Rd.	EB Stop	B	11.7	B	11.7	B	11.1	B	11.1
Kids First Pl. / Golf Course Rd.	NB Stop	A	8.3	A	8.3	A	8.4	A	8.4

With removal of the traffic signal at Circle Dr., conversion of the Circle Dr. driveway to right-in/right-out movements only, shift in traffic volumes to the Chapel Gate Dr. and CSTC Entrance driveways, and installation of traffic signals at the Chapel Gate Dr. and CSTC Entrance driveways, the study intersection LOS improve and all meet the City of Lakewood's LOS thresholds.

Appendix

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
WEST ST E/O
SENTINEL DR
LOC# 01 V TSI19016TM

Site Code: 01

Date Start: 28-May-19
Date End: 30-May-19

Start	27-May-19		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
12:00 AM	*	*	0	1	1	3	1	1	*	*	*	*	*	*	1	2
01:00	*	*	0	0	2	2	0	0	*	*	*	*	*	*	1	1
02:00	*	*	0	0	2	0	0	0	*	*	*	*	*	*	1	0
03:00	*	*	0	0	0	0	1	1	*	*	*	*	*	*	0	0
04:00	*	*	1	0	1	0	1	0	*	*	*	*	*	*	1	0
05:00	*	*	17	0	19	0	19	1	*	*	*	*	*	*	18	0
06:00	*	*	22	1	26	3	25	1	*	*	*	*	*	*	24	2
07:00	*	*	**42**	11	**55**	**15**	**56**	**16**	*	*	*	*	*	*	**51**	**14**
08:00	*	*	19	3	28	8	24	8	*	*	*	*	*	*	24	6
09:00	*	*	17	2	14	10	10	6	*	*	*	*	*	*	14	6
10:00	*	*	13	9	7	5	11	7	*	*	*	*	*	*	10	7
11:00	*	*	10	**13**	9	12	9	8	*	*	*	*	*	*	9	11
12:00 PM	*	*	16	13	**30**	11	15	9	*	*	*	*	*	*	**20**	11
01:00	*	*	13	6	22	14	21	8	*	*	*	*	*	*	19	9
02:00	*	*	**18**	13	21	9	**22**	10	*	*	*	*	*	*	20	11
03:00	*	*	8	28	7	24	9	23	*	*	*	*	*	*	8	25
04:00	*	*	6	**36**	9	**33**	4	**30**	*	*	*	*	*	*	6	**33**
05:00	*	*	0	6	1	7	6	16	*	*	*	*	*	*	2	10
06:00	*	*	2	4	3	5	3	4	*	*	*	*	*	*	3	4
07:00	*	*	2	4	4	1	6	13	*	*	*	*	*	*	4	6
08:00	*	*	2	1	3	1	2	8	*	*	*	*	*	*	2	3
09:00	*	*	0	1	3	3	4	7	*	*	*	*	*	*	2	4
10:00	*	*	5	2	7	5	2	3	*	*	*	*	*	*	5	3
11:00	*	*	3	2	1	3	3	5	*	*	*	*	*	*	2	3
Lane	0	0	216	156	275	174	254	185	0	0	0	0	0	0	247	171
Day	0		372		449		439		0		0		0		418	
AM Peak	-	-	07:00	11:00	07:00	07:00	07:00	07:00	-	-	-	-	-	-	07:00	07:00
Vol.	-	-	42	13	55	15	56	16	-	-	-	-	-	-	51	14
PM Peak	-	-	14:00	16:00	12:00	16:00	14:00	16:00	-	-	-	-	-	-	12:00	16:00
Vol.	-	-	18	36	30	33	22	30	-	-	-	-	-	-	20	33

Comb. Total	0	372	449	439	0	0	0	418

ADT ADT 420 AADT 420

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
SOUTH ST E/O
SENTINEL DR
LOC# 02 V TSI19016TM

Site Code: 02

Date Start: 28-May-19
Date End: 30-May-19

Start	27-May-19		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN
12:00 AM	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
01:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
02:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	0	0	0	2	0	0	*	*	*	*	*	*	0	1
04:00	*	*	0	0	0	0	1	0	*	*	*	*	*	*	0	0
05:00	*	*	3	2	7	6	3	6	*	*	*	*	*	*	4	5
06:00	*	*	**11**	**44**	10	**20**	11	**24**	*	*	*	*	*	*	11	**29**
07:00	*	*	10	10	**14**	20	**12**	18	*	*	*	*	*	*	**12**	16
08:00	*	*	6	14	8	20	1	16	*	*	*	*	*	*	5	17
09:00	*	*	11	28	11	10	10	14	*	*	*	*	*	*	11	17
10:00	*	*	5	6	4	6	9	22	*	*	*	*	*	*	6	11
11:00	*	*	8	4	10	10	10	8	*	*	*	*	*	*	9	7
12:00 PM	*	*	10	6	12	0	7	**4**	*	*	*	*	*	*	10	3
01:00	*	*	10	8	9	8	8	4	*	*	*	*	*	*	9	7
02:00	*	*	**15**	**14**	11	**12**	**19**	4	*	*	*	*	*	*	**15**	**10**
03:00	*	*	15	2	**15**	4	15	0	*	*	*	*	*	*	15	2
04:00	*	*	6	0	13	2	9	2	*	*	*	*	*	*	9	1
05:00	*	*	2	8	5	8	2	2	*	*	*	*	*	*	3	6
06:00	*	*	2	0	1	0	1	0	*	*	*	*	*	*	1	0
07:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
08:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
09:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
10:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
11:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
Lane	0	0	114	146	130	128	118	124	0	0	0	0	0	0	120	132
Day	0		260		258		242		0		0		0		252	
AM Peak	-	-	06:00	06:00	07:00	06:00	07:00	06:00	-	-	-	-	-	-	07:00	06:00
Vol.	-	-	11	44	14	20	12	24	-	-	-	-	-	-	12	29
PM Peak	-	-	14:00	14:00	15:00	14:00	14:00	12:00	-	-	-	-	-	-	14:00	14:00
Vol.	-	-	15	14	15	12	19	4	-	-	-	-	-	-	15	10

Comb. Total	0	260	258	242	0	0	0	252

ADT ADT 253 AADT 253

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
CHAPEL GATE DR N/O
STEILACOOM BLVD
LOC# 03N V TSI19016TM

Site Code: 03N

Date Start: 28-May-19
Date End: 30-May-19

Start	27-May-19		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
12:00 AM	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
01:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
02:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
04:00	*	*	3	0	4	1	5	3	*	*	*	*	*	*	4	1
05:00	*	*	18	5	32	5	26	4	*	*	*	*	*	*	25	5
06:00	*	*	**115**	20	**117**	27	120	21	*	*	*	*	*	*	**117**	23
07:00	*	*	97	16	104	21	**121**	16	*	*	*	*	*	*	107	18
08:00	*	*	44	13	45	12	40	10	*	*	*	*	*	*	43	12
09:00	*	*	30	20	31	12	33	18	*	*	*	*	*	*	31	17
10:00	*	*	20	18	21	17	18	14	*	*	*	*	*	*	20	16
11:00	*	*	15	**28**	20	**30**	21	**24**	*	*	*	*	*	*	19	**27**
12:00 PM	*	*	**36**	30	34	32	31	35	*	*	*	*	*	*	34	32
01:00	*	*	29	27	23	50	23	32	*	*	*	*	*	*	25	36
02:00	*	*	31	63	**48**	49	**44**	49	*	*	*	*	*	*	**41**	54
03:00	*	*	12	**85**	12	**90**	16	**95**	*	*	*	*	*	*	13	**90**
04:00	*	*	4	76	8	61	6	70	*	*	*	*	*	*	6	69
05:00	*	*	3	25	4	32	8	29	*	*	*	*	*	*	5	29
06:00	*	*	9	19	5	18	3	13	*	*	*	*	*	*	6	17
07:00	*	*	0	8	2	12	9	12	*	*	*	*	*	*	4	11
08:00	*	*	2	2	8	6	1	6	*	*	*	*	*	*	4	5
09:00	*	*	3	4	4	2	5	7	*	*	*	*	*	*	4	4
10:00	*	*	17	30	14	31	23	23	*	*	*	*	*	*	18	28
11:00	*	*	0	25	3	17	2	21	*	*	*	*	*	*	2	21
Lane	0	0	488	514	539	525	555	502	0	0	0	0	0	0	528	515
Day	0		1002		1064		1057		0		0		0		1043	
AM Peak	-	-	06:00	11:00	06:00	11:00	07:00	11:00	-	-	-	-	-	-	06:00	11:00
Vol.	-	-	115	28	117	30	121	24	-	-	-	-	-	-	117	27
PM Peak	-	-	12:00	15:00	14:00	15:00	14:00	15:00	-	-	-	-	-	-	14:00	15:00
Vol.	-	-	36	85	48	90	44	95	-	-	-	-	-	-	41	90

Comb. Total	0	1002	1064	1057	0	0	0	1043

ADT ADT 1,041 AADT 1,041

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
CIRCLE DR N/O
STEILACOOM BLVD
LOC# 04 V TSI19016TM

Site Code: 04

Date Start: 28-May-19
Date End: 30-May-19

Start	27-May-19		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
12:00 AM	*	*	3	9	5	18	3	11	*	*	*	*	*	*	4	13
01:00	*	*	2	7	2	14	1	3	*	*	*	*	*	*	2	8
02:00	*	*	3	8	3	10	2	11	*	*	*	*	*	*	3	10
03:00	*	*	4	14	7	14	5	17	*	*	*	*	*	*	5	15
04:00	*	*	12	10	11	11	14	9	*	*	*	*	*	*	12	10
05:00	*	*	47	34	56	53	71	44	*	*	*	*	*	*	58	44
06:00	*	*	**180**	**124**	**181**	108	**174**	122	*	*	*	*	*	*	**178**	**118**
07:00	*	*	113	107	125	**111**	121	**125**	*	*	*	*	*	*	120	114
08:00	*	*	62	41	66	35	62	37	*	*	*	*	*	*	63	38
09:00	*	*	45	41	45	28	45	41	*	*	*	*	*	*	45	37
10:00	*	*	24	31	24	40	27	38	*	*	*	*	*	*	25	36
11:00	*	*	23	59	38	75	28	65	*	*	*	*	*	*	30	66
12:00 PM	*	*	60	78	52	81	49	87	*	*	*	*	*	*	54	82
01:00	*	*	48	48	50	65	44	78	*	*	*	*	*	*	47	64
02:00	*	*	**92**	145	**95**	153	110	143	*	*	*	*	*	*	**99**	147
03:00	*	*	15	**187**	19	**206**	40	**212**	*	*	*	*	*	*	25	**202**
04:00	*	*	13	155	14	157	27	144	*	*	*	*	*	*	18	152
05:00	*	*	8	89	12	89	6	61	*	*	*	*	*	*	9	80
06:00	*	*	11	55	10	55	20	64	*	*	*	*	*	*	14	58
07:00	*	*	8	21	15	35	6	16	*	*	*	*	*	*	10	24
08:00	*	*	11	20	13	22	13	20	*	*	*	*	*	*	12	21
09:00	*	*	13	16	16	23	21	17	*	*	*	*	*	*	17	19
10:00	*	*	79	114	80	128	**116**	90	*	*	*	*	*	*	92	111
11:00	*	*	4	69	7	82	10	92	*	*	*	*	*	*	7	81
Lane	0	0	880	1482	946	1613	1015	1547	0	0	0	0	0	0	949	1550
Day	0		2362		2559		2562		0		0		0		2499	
AM Peak	-	-	06:00	06:00	06:00	07:00	06:00	07:00	-	-	-	-	-	-	06:00	06:00
Vol.	-	-	180	124	181	111	174	125	-	-	-	-	-	-	178	118
PM Peak	-	-	14:00	15:00	14:00	15:00	22:00	15:00	-	-	-	-	-	-	14:00	15:00
Vol.	-	-	92	187	95	206	116	212	-	-	-	-	-	-	99	202

Comb. Total	0	2362	2559	2562	0	0	0	2499

ADT ADT 2,494 AADT 2,494

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
CSTC ENTRANCE N/O
STEILACOOM BLVD
LOC# 05N V TSI19016TM

Site Code: 05N

Date Start: 28-May-19
Date End: 30-May-19

Start	27-May-19		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
12:00 AM	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
01:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
02:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	1	1	0	0	1	0	*	*	*	*	*	*	1	0
04:00	*	*	5	0	9	1	5	0	*	*	*	*	*	*	6	0
05:00	*	*	48	1	45	4	48	5	*	*	*	*	*	*	47	3
06:00	*	*	**171**	30	**159**	22	**175**	20	*	*	*	*	*	*	**168**	24
07:00	*	*	142	**42**	135	**45**	139	**45**	*	*	*	*	*	*	139	**44**
08:00	*	*	73	19	86	14	80	19	*	*	*	*	*	*	80	17
09:00	*	*	26	13	28	19	24	21	*	*	*	*	*	*	26	18
10:00	*	*	22	21	16	9	27	20	*	*	*	*	*	*	22	17
11:00	*	*	36	41	25	38	38	34	*	*	*	*	*	*	33	38
12:00 PM	*	*	59	34	69	30	64	42	*	*	*	*	*	*	64	35
01:00	*	*	40	24	36	31	41	23	*	*	*	*	*	*	39	26
02:00	*	*	**133**	76	**126**	73	**147**	76	*	*	*	*	*	*	**135**	75
03:00	*	*	20	**97**	22	**104**	18	**100**	*	*	*	*	*	*	20	**100**
04:00	*	*	17	61	15	71	12	52	*	*	*	*	*	*	15	61
05:00	*	*	11	21	8	24	7	30	*	*	*	*	*	*	9	25
06:00	*	*	6	24	16	23	11	25	*	*	*	*	*	*	11	24
07:00	*	*	12	16	9	16	11	17	*	*	*	*	*	*	11	16
08:00	*	*	7	17	10	12	16	15	*	*	*	*	*	*	11	15
09:00	*	*	8	10	14	14	9	7	*	*	*	*	*	*	10	10
10:00	*	*	57	43	62	48	69	61	*	*	*	*	*	*	63	51
11:00	*	*	1	74	4	60	2	49	*	*	*	*	*	*	2	61
Lane	0	0	895	665	894	658	944	661	0	0	0	0	0	0	912	660
Day	0		1560		1552		1605		0		0		0		1572	
AM Peak	-	-	06:00	07:00	06:00	07:00	06:00	07:00	-	-	-	-	-	-	06:00	07:00
Vol.	-	-	171	42	159	45	175	45	-	-	-	-	-	-	168	44
PM Peak	-	-	14:00	15:00	14:00	15:00	14:00	15:00	-	-	-	-	-	-	14:00	15:00
Vol.	-	-	133	97	126	104	147	100	-	-	-	-	-	-	135	100

Comb. Total	0	1560	1552	1605	0	0	0	1572

ADT ADT 1,572 AADT 1,572

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
OAKRIDGE GROUP HOME ENT W/O
87TH AVE SW
LOC# 06 V TSI19016TM

Site Code: 06

Date Start: 28-May-19
Date End: 30-May-19

Start	27-May-19		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
12:00 AM	*	*	1	1	1	1	1	1	*	*	*	*	*	*	1	1
01:00	*	*	0	2	0	1	0	1	*	*	*	*	*	*	0	1
02:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
04:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
05:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
06:00	*	*	1	0	1	0	1	0	*	*	*	*	*	*	1	0
07:00	*	*	3	3	4	3	2	2	*	*	*	*	*	*	3	3
08:00	*	*	**14**	**6**	**13**	**4**	**10**	**7**	*	*	*	*	*	*	**12**	**6**
09:00	*	*	3	2	2	2	3	0	*	*	*	*	*	*	3	1
10:00	*	*	1	0	2	3	0	3	*	*	*	*	*	*	1	2
11:00	*	*	1	0	3	2	3	5	*	*	*	*	*	*	2	2
12:00 PM	*	*	**5**	5	2	**10**	2	**5**	*	*	*	*	*	*	**3**	**7**
01:00	*	*	2	1	**6**	2	2	0	*	*	*	*	*	*	3	1
02:00	*	*	1	1	2	2	1	1	*	*	*	*	*	*	1	1
03:00	*	*	3	4	1	8	1	2	*	*	*	*	*	*	2	5
04:00	*	*	1	**6**	0	4	1	4	*	*	*	*	*	*	1	5
05:00	*	*	3	3	0	2	**3**	3	*	*	*	*	*	*	2	3
06:00	*	*	1	2	1	4	0	1	*	*	*	*	*	*	1	2
07:00	*	*	0	0	0	0	1	1	*	*	*	*	*	*	0	0
08:00	*	*	1	1	2	1	3	2	*	*	*	*	*	*	2	1
09:00	*	*	1	1	1	0	1	1	*	*	*	*	*	*	1	1
10:00	*	*	0	0	0	1	0	1	*	*	*	*	*	*	0	1
11:00	*	*	1	0	2	0	2	1	*	*	*	*	*	*	2	0
Lane	0	0	43	38	43	50	37	41	0	0	0	0	0	0	41	43
Day	0		81		93		78		0		0		0		84	
AM Peak	-	-	08:00	08:00	08:00	08:00	08:00	08:00	-	-	-	-	-	-	08:00	08:00
Vol.	-	-	14	6	13	4	10	7	-	-	-	-	-	-	12	6
PM Peak	-	-	12:00	16:00	13:00	12:00	17:00	12:00	-	-	-	-	-	-	12:00	12:00
Vol.	-	-	5	6	6	10	3	5	-	-	-	-	-	-	3	7

Comb. Total	0	81	93	78	0	0	0	84

ADT ADT 84 AADT 84

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
GOLF COURSE RD SW W/O
87TH AVE SW
LOC# 07 V TSI19016TM

Site Code: 07

Date Start: 28-May-19
Date End: 30-May-19

Start	27-May-19		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
12:00 AM	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
01:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
02:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
04:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
05:00	*	*	3	2	1	1	0	0	*	*	*	*	*	*	1	1
06:00	*	*	3	0	4	3	3	1	*	*	*	*	*	*	3	1
07:00	*	*	7	8	10	4	11	4	*	*	*	*	*	*	9	5
08:00	*	*	18	5	8	3	10	1	*	*	*	*	*	*	12	3
09:00	*	*	8	3	12	12	11	9	*	*	*	*	*	*	10	8
10:00	*	*	**21**	**15**	**18**	11	7	**16**	*	*	*	*	*	*	**15**	**14**
11:00	*	*	12	15	11	**14**	**12**	13	*	*	*	*	*	*	12	14
12:00 PM	*	*	13	29	**18**	15	15	8	*	*	*	*	*	*	15	17
01:00	*	*	11	13	11	18	20	10	*	*	*	*	*	*	14	14
02:00	*	*	10	14	14	23	12	25	*	*	*	*	*	*	12	21
03:00	*	*	12	**31**	16	**34**	18	**49**	*	*	*	*	*	*	15	**38**
04:00	*	*	**16**	24	16	21	27	19	*	*	*	*	*	*	**20**	21
05:00	*	*	10	14	10	19	**37**	15	*	*	*	*	*	*	19	16
06:00	*	*	12	15	12	13	14	17	*	*	*	*	*	*	13	15
07:00	*	*	10	7	6	17	3	17	*	*	*	*	*	*	6	14
08:00	*	*	1	13	8	10	8	36	*	*	*	*	*	*	6	20
09:00	*	*	0	7	2	8	2	10	*	*	*	*	*	*	1	8
10:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
11:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
Lane	0	0	167	215	177	226	210	250	0	0	0	0	0	0	183	230
Day	0		382		403		460		0		0		0		413	
AM Peak	-	-	10:00	10:00	10:00	11:00	11:00	10:00	-	-	-	-	-	-	10:00	10:00
Vol.	-	-	21	15	18	14	12	16	-	-	-	-	-	-	15	14
PM Peak	-	-	16:00	15:00	12:00	15:00	17:00	15:00	-	-	-	-	-	-	16:00	15:00
Vol.	-	-	16	31	18	34	37	49	-	-	-	-	-	-	20	38

Comb. Total	0	382	403	460	0	0	0	413

ADT ADT 415 AADT 415

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
KIDS FIRST PL S/O
GOLF COURSE RD
LOC# 08 V TSI19016TM

Site Code: 08

Date Start: 28-May-19
Date End: 30-May-19

Start	27-May-19		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
12:00 AM	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
01:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
02:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
03:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
04:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
05:00	*	*	0	1	0	0	0	1	*	*	*	*	*	*	0	1
06:00	*	*	2	2	3	3	1	0	*	*	*	*	*	*	2	2
07:00	*	*	4	4	**4**	2	**6**	2	*	*	*	*	*	*	**5**	3
08:00	*	*	**5**	4	4	0	4	1	*	*	*	*	*	*	4	2
09:00	*	*	4	3	4	8	3	**7**	*	*	*	*	*	*	4	6
10:00	*	*	1	**7**	3	4	3	7	*	*	*	*	*	*	2	6
11:00	*	*	2	4	4	**10**	4	7	*	*	*	*	*	*	3	**7**
12:00 PM	*	*	**3**	10	**5**	7	**6**	6	*	*	*	*	*	*	**5**	8
01:00	*	*	3	6	2	6	4	3	*	*	*	*	*	*	3	5
02:00	*	*	1	6	4	13	2	16	*	*	*	*	*	*	2	12
03:00	*	*	0	**27**	2	**24**	0	**39**	*	*	*	*	*	*	1	**30**
04:00	*	*	2	11	2	13	2	8	*	*	*	*	*	*	2	11
05:00	*	*	1	3	1	4	3	5	*	*	*	*	*	*	2	4
06:00	*	*	1	1	0	0	1	0	*	*	*	*	*	*	1	0
07:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
08:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
09:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
10:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
11:00	*	*	0	0	0	0	0	0	*	*	*	*	*	*	0	0
Lane	0	0	29	89	38	94	39	102	0	0	0	0	0	0	36	97
Day	0		118		132		141		0		0		0		133	
AM Peak	-	-	08:00	10:00	07:00	11:00	07:00	09:00	-	-	-	-	-	-	07:00	11:00
Vol.	-	-	5	7	4	10	6	7	-	-	-	-	-	-	5	7
PM Peak	-	-	12:00	15:00	12:00	15:00	12:00	15:00	-	-	-	-	-	-	12:00	15:00
Vol.	-	-	3	27	5	24	6	39	-	-	-	-	-	-	5	30

Comb. Total	0	118	132	141	0	0	0	133

ADT ADT 130 AADT 130

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
STEILACOOM BLVD SW W/O
CHAPEL GATE DR
LOC# 03W V TSI19016TM

Site Code: 03W

Date Start: 28-May-19
Date End: 30-May-19

Start Time	Mon 27-May-19	Tue 28-May-19	Wed 29-May-19	Thu 30-May-19	Fri 31-May-19	Average Day	Sat 01-Jun-19	Sun 02-Jun-19	Week Average
12:00 AM	*	37	45	36	*	39	*	*	39
01:00	*	21	9	15	*	15	*	*	15
02:00	*	16	14	16	*	15	*	*	15
03:00	*	30	24	32	*	29	*	*	29
04:00	*	77	79	67	*	74	*	*	74
05:00	*	179	192	206	*	192	*	*	192
06:00	*	412	429	444	*	428	*	*	428
07:00	*	**651**	**707**	**679**	*	**679**	*	*	**679**
08:00	*	538	590	543	*	557	*	*	557
09:00	*	539	597	571	*	569	*	*	569
10:00	*	568	522	501	*	530	*	*	530
11:00	*	602	604	576	*	594	*	*	594
12:00 PM	*	618	583	611	*	604	*	*	604
01:00	*	578	629	608	*	605	*	*	605
02:00	*	695	**741**	**738**	*	**725**	*	*	**725**
03:00	*	651	690	658	*	666	*	*	666
04:00	*	643	671	724	*	679	*	*	679
05:00	*	**696**	727	729	*	717	*	*	717
06:00	*	520	505	519	*	515	*	*	515
07:00	*	396	395	468	*	420	*	*	420
08:00	*	338	417	377	*	377	*	*	377
09:00	*	203	213	272	*	229	*	*	229
10:00	*	131	147	171	*	150	*	*	150
11:00	*	64	84	75	*	74	*	*	74
Day Total	0	9203	9614	9636	0	9482	0	0	9482
% Avg. WkDay	0.0%	97.1%	101.4%	101.6%	0.0%				
% Avg. Week	0.0%	97.1%	101.4%	101.6%	0.0%	100.0%	0.0%	0.0%	
AM Peak	-	07:00	07:00	07:00	-	07:00	-	-	07:00
Vol.	-	651	707	679	-	679	-	-	679
PM Peak	-	17:00	14:00	14:00	-	14:00	-	-	14:00
Vol.	-	696	741	738	-	725	-	-	725
Grand Total	0	9203	9614	9636	0	9482	0	0	9482

ADT	ADT 9,484	AADT 9,484

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
STEILACOOM BLVD SW E/O
CHAPEL GATE DR
LOC# 03E V TSI19016TM

Site Code: 03E

Date Start: 28-May-19
Date End: 30-May-19

Start Time	Mon 27-May-19	Tue 28-May-19	Wed 29-May-19	Thu 30-May-19	Fri 31-May-19	Average Day	Sat 01-Jun-19	Sun 02-Jun-19	Week Average
12:00 AM	*	45	49	52	*	49	*	*	49
01:00	*	25	30	30	*	28	*	*	28
02:00	*	19	23	19	*	20	*	*	20
03:00	*	26	28	26	*	27	*	*	27
04:00	*	40	47	44	*	44	*	*	44
05:00	*	201	228	239	*	223	*	*	223
06:00	*	412	429	454	*	432	*	*	432
07:00	*	**741**	**736**	**747**	*	**741**	*	*	**741**
08:00	*	585	597	597	*	593	*	*	593
09:00	*	488	533	506	*	509	*	*	509
10:00	*	508	481	468	*	486	*	*	486
11:00	*	529	496	513	*	513	*	*	513
12:00 PM	*	574	616	556	*	582	*	*	582
01:00	*	552	629	515	*	565	*	*	565
02:00	*	645	666	683	*	665	*	*	665
03:00	*	711	720	770	*	734	*	*	734
04:00	*	**767**	822	821	*	803	*	*	803
05:00	*	763	**830**	**851**	*	**815**	*	*	**815**
06:00	*	708	636	651	*	665	*	*	665
07:00	*	471	526	520	*	506	*	*	506
08:00	*	408	424	441	*	424	*	*	424
09:00	*	281	290	314	*	295	*	*	295
10:00	*	164	181	256	*	200	*	*	200
11:00	*	117	150	138	*	135	*	*	135
Day Total	0	9780	10167	10211	0	10054	0	0	10054
% Avg. WkDay	0.0%	97.3%	101.1%	101.6%	0.0%				
% Avg. Week	0.0%	97.3%	101.1%	101.6%	0.0%	100.0%	0.0%	0.0%	
AM Peak	-	07:00	07:00	07:00	-	07:00	-	-	07:00
Vol.	-	741	736	747	-	741	-	-	741
PM Peak	-	16:00	17:00	17:00	-	17:00	-	-	17:00
Vol.	-	767	830	851	-	815	-	-	815
Grand Total	0	9780	10167	10211	0	10054	0	0	10054

ADT ADT 10,053 AADT 10,053

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
STEILACOOM BLVD SW W/O
CSTC ENTRANCE
LOC# 05W V TSI19016TM

Site Code: 05W

Date Start: 28-May-19
Date End: 30-May-19

Start Time	Mon 27-May-19	Tue 28-May-19	Wed 29-May-19	Thu 30-May-19	Fri 31-May-19	Average Day	Sat 01-Jun-19	Sun 02-Jun-19	Week Average
12:00 AM	*	39	55	43	*	46	*	*	46
01:00	*	24	16	15	*	18	*	*	18
02:00	*	22	19	22	*	21	*	*	21
03:00	*	31	25	38	*	31	*	*	31
04:00	*	72	75	66	*	71	*	*	71
05:00	*	161	168	173	*	167	*	*	167
06:00	*	370	367	389	*	375	*	*	375
07:00	*	669	**738**	**702**	*	**703**	*	*	**703**
08:00	*	515	552	535	*	534	*	*	534
09:00	*	557	589	579	*	575	*	*	575
10:00	*	577	551	536	*	555	*	*	555
11:00	*	**676**	669	640	*	662	*	*	662
12:00 PM	*	673	644	686	*	668	*	*	668
01:00	*	611	695	650	*	652	*	*	652
02:00	*	791	829	825	*	815	*	*	815
03:00	*	**865**	**926**	889	*	**893**	*	*	**893**
04:00	*	834	866	**890**	*	863	*	*	863
05:00	*	789	812	803	*	801	*	*	801
06:00	*	564	567	577	*	569	*	*	569
07:00	*	412	411	476	*	433	*	*	433
08:00	*	355	440	396	*	397	*	*	397
09:00	*	196	207	279	*	227	*	*	227
10:00	*	173	207	223	*	201	*	*	201
11:00	*	151	176	174	*	167	*	*	167
Day Total	0	10127	10604	10606	0	10444	0	0	10444
% Avg. WkDay	0.0%	97.0%	101.5%	101.6%	0.0%				
% Avg. Week	0.0%	97.0%	101.5%	101.6%	0.0%	100.0%	0.0%	0.0%	
AM Peak	-	11:00	07:00	07:00	-	07:00	-	-	07:00
Vol.	-	676	738	702	-	703	-	-	703
PM Peak	-	15:00	15:00	16:00	-	15:00	-	-	15:00
Vol.	-	865	926	890	-	893	-	-	893
Grand Total	0	10127	10604	10606	0	10444	0	0	10444

ADT ADT 10,446 AADT 10,446

TRAFFIC COUNT CONSULTANTS, INC.

Team@tc2inc.com
(253) 770-1407

LAKEWOOD, WASHINGTON
STEILACOOM BLVD SW E/O
CSTC ENTRANCE
LOC# 05E V TSI19016TM

Site Code: 05E

Date Start: 28-May-19
Date End: 30-May-19

Start Time	Mon 27-May-19	Tue 28-May-19	Wed 29-May-19	Thu 30-May-19	Fri 31-May-19	Average Day	Sat 01-Jun-19	Sun 02-Jun-19	Week Average
12:00 AM	*	51	57	57	*	55	*	*	55
01:00	*	28	39	32	*	33	*	*	33
02:00	*	25	26	17	*	23	*	*	23
03:00	*	31	34	36	*	34	*	*	34
04:00	*	62	77	68	*	69	*	*	69
05:00	*	294	325	344	*	321	*	*	321
06:00	*	729	725	783	*	746	*	*	746
07:00	*	**936**	**954**	**942**	*	**944**	*	*	**944**
08:00	*	680	705	713	*	699	*	*	699
09:00	*	548	592	562	*	567	*	*	567
10:00	*	535	510	507	*	517	*	*	517
11:00	*	580	531	563	*	558	*	*	558
12:00 PM	*	675	708	637	*	673	*	*	673
01:00	*	609	687	582	*	626	*	*	626
02:00	*	**815**	**836**	**855**	*	**835**	*	*	**835**
03:00	*	666	676	724	*	689	*	*	689
04:00	*	740	802	777	*	773	*	*	773
05:00	*	762	828	842	*	811	*	*	811
06:00	*	717	642	664	*	674	*	*	674
07:00	*	486	545	528	*	520	*	*	520
08:00	*	411	446	448	*	435	*	*	435
09:00	*	301	312	340	*	318	*	*	318
10:00	*	294	317	388	*	333	*	*	333
11:00	*	96	130	114	*	113	*	*	113
Day Total	0	11071	11504	11523	0	11366	0	0	11366
% Avg. WkDay	0.0%	97.4%	101.2%	101.4%	0.0%				
% Avg. Week	0.0%	97.4%	101.2%	101.4%	0.0%	100.0%	0.0%	0.0%	
AM Peak	-	07:00	07:00	07:00	-	07:00	-	-	07:00
Vol.	-	936	954	942	-	944	-	-	944
PM Peak	-	14:00	14:00	14:00	-	14:00	-	-	14:00
Vol.	-	815	836	855	-	835	-	-	835
Grand Total	0	11071	11504	11523	0	11366	0	0	11366

ADT ADT 11,366 AADT 11,366

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

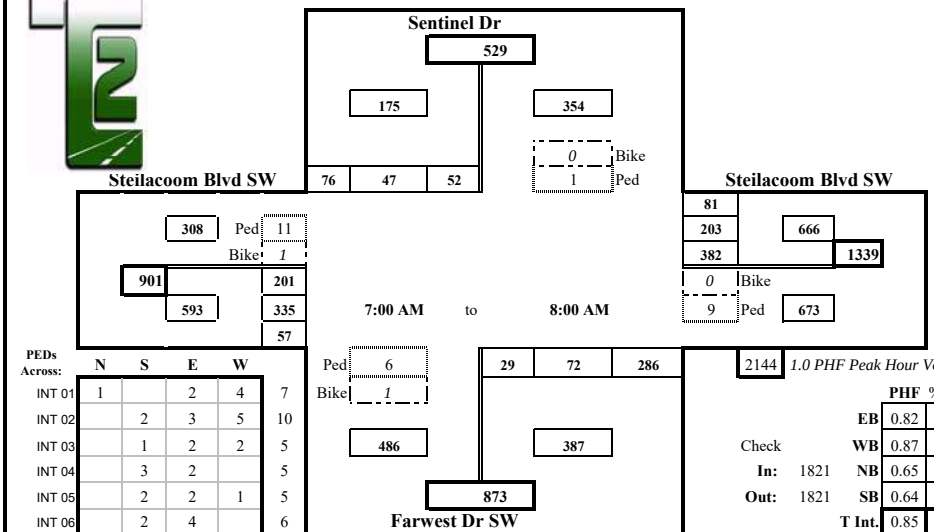
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sentinel Dr/Farwest Dr SW & Steilacoom Blvd SW **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sentinel Dr				From South on (NB) Farwest Dr SW				From East on (WB) Steilacoom Blvd SW				From West on (EB) Steilacoom Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	2	8	7	17	2	9	10	67	5	104	69	19	9	52	76	14	452
7:30 A	8	23	17	28	4	9	42	99	3	82	41	36	4	84	62	13	536
7:45 A	4	18	19	28	2	6	18	61	5	80	44	13	1	53	115	13	468
8:00 A	2	3	4	3	0	5	2	59	3	116	49	13	1	12	82	17	365
8:15 A	2	3	1	2	3	11	5	46	4	67	33	4	5	12	100	20	304
8:30 A	2	3	4	4	2	9	3	53	1	66	51	4	1	11	77	22	307
8:45 A	1	6	8	9	3	4	4	33	5	80	62	3	2	8	74	15	306
9:00 A	0	7	3	4	1	9	4	60	1	104	76	3	1	5	84	19	378
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	21	71	63	95	17	62	88	478	27	699	425	95	24	237	670	133	3116
	Peak Hour: 7:00 AM to 8:00 AM																
Total	16	52	47	76	8	29	72	286	16	382	203	81	15	201	335	57	1821
Approach	175				387				666				593				1821
%HV	9.1%				2.1%				2.4%				2.5%				3.0%
PHF	0.64				0.65				0.87				0.82				0.85



PEDs Across:	N	S	E	W	
INT 01	1		2	4	7
INT 02		2	3	5	10
INT 03		1	2	2	5
INT 04		3	2		5
INT 05		2	2	1	5
INT 06		2	4		6
INT 07	1	4	1	1	7
INT 08	1	4			5
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	3	18	16	13	50

Special Notes

2144 *1.0 PHF Peak Hour Volume*

	PHF	%HV
EB	0.82	2.5%
WB	0.87	2.4%
NB	0.65	2.1%
SB	0.64	9.1%
T Int.	0.85	3.0%

Check In: 1821 Out: 1821

Bicycles From:	N	S	E	W	
INT 01		1		1	2
INT 02					0
INT 03					0
INT 04					0
INT 05				2	2
INT 06					0
INT 07	1				1
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	1	0	3	5

	N U's	S U's	E U's	W U's
	0	0		
	0	0		
	0	0		
	0	0		
	0	1		
	0	0		
	1	0		
	0	0		
	0			
	0			
	0			
	0			
	0	1	0	0

TSI19016TM_01a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

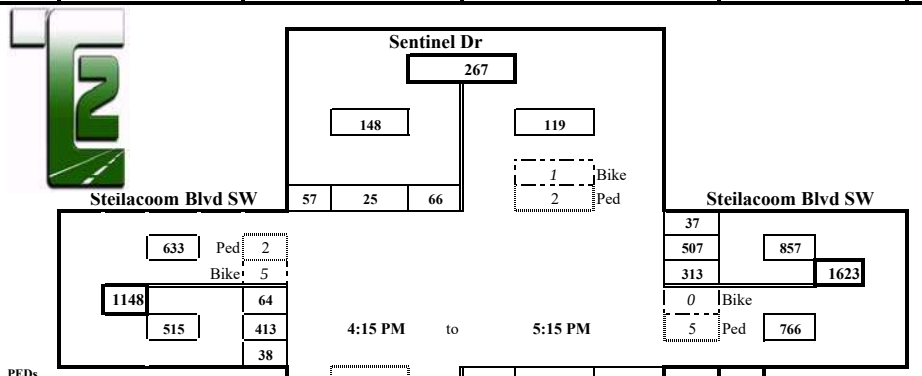
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sentinel Dr/Farwest Dr SW & Steilacoom Blvd SW **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sentinel Dr				From South on (NB) Farwest Dr SW				From East on (WB) Steilacoom Blvd SW				From West on (EB) Steilacoom Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	11	9	20	3	15	4	63	2	71	115	6	0	2	84	13	413
4:30 P	0	12	4	14	1	16	4	69	1	84	131	8	1	1	81	14	438
4:45 P	0	22	4	10	2	15	2	73	1	73	132	9	1	7	102	9	458
5:00 P	0	16	10	16	0	24	8	54	1	75	122	12	2	21	123	8	489
5:15 P	1	16	7	17	2	14	4	91	3	81	122	8	1	35	107	7	509
5:30 P	0	19	1	12	0	13	4	52	0	75	126	9	1	7	100	10	428
5:45 P	0	8	0	9	2	17	5	56	1	83	129	17	1	22	96	12	454
6:00 P	1	9	5	6	1	13	6	68	1	84	114	21	0	55	108	5	494
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	113	40	104	11	127	37	526	10	626	991	90	7	150	801	78	3683
Peak Hour: 4:15 PM to 5:15 PM																	
Total	1	66	25	57	5	69	18	287	6	313	507	37	5	64	413	38	1894
Approach	148				374				857				515				1894
%HV	0.7%				1.3%				0.7%				1.0%				0.9%
PHF	0.88				0.86				0.96				0.85				0.93



PEDs Across:	N	S	E	W	
INT 01		2	1	1	4
INT 02	1	1	1		3
INT 03	1	1	3		5
INT 04		2	1	1	4
INT 05		1		1	2
INT 06					0
INT 07		3	1	2	6
INT 08		1		3	4
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	2	11	7	8	28

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03				2	2
INT 04	1			2	3
INT 05				1	1
INT 06		1	3	1	5
INT 07					0
INT 08	2		4	2	8
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	3	1	7	8	19

2036 *1.0 PHF Peak Hour Volume*

		PHF	%HV
		EB	0.85	1.0%
Check		WB	0.96	0.7%
In:	1894	NB	0.86	1.3%
Out:	1894	SB	0.88	0.7%
		T Int.	0.93	0.9%

Special Notes

TSI19016TM_01p

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

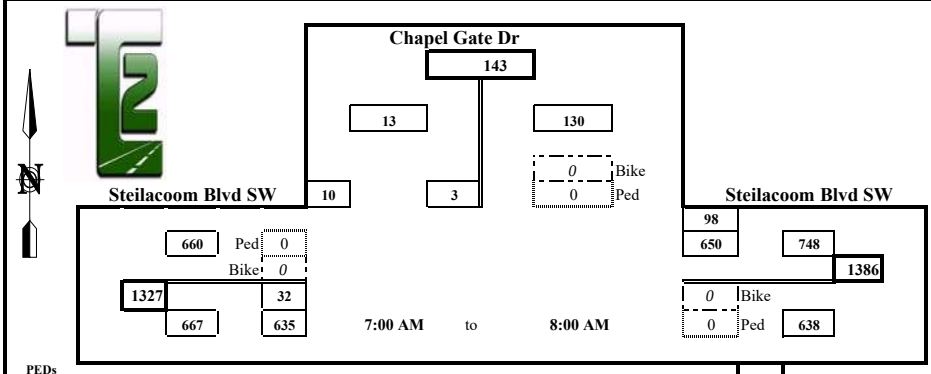
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Chapel Gate Dr & Steilacoom Blvd SW **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Chapel Gate Dr				From South on (NB) 0				From East on (WB) Steilacoom Blvd SW				From West on (EB) Steilacoom Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	0	0	5	0	0	0	0	5	0	184	18	2	8	137	0	352
7:30 A	0	2	0	1	0	0	0	0	4	0	164	33	5	10	171	0	381
7:45 A	0	1	0	2	0	0	0	0	4	0	128	26	4	10	183	0	350
8:00 A	1	0	0	2	0	0	0	0	4	0	174	21	1	4	144	0	345
8:15 A	1	3	0	1	0	0	0	0	3	0	106	11	5	4	143	0	268
8:30 A	1	4	0	0	0	0	0	0	1	0	125	5	3	3	131	0	268
8:45 A	0	2	0	0	0	0	0	0	5	0	140	8	2	5	110	0	265
9:00 A	0	1	0	0	0	0	0	0	2	0	184	7	0	2	154	0	348
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	3	13	0	11	0	0	0	0	28	0	1205	129	22	46	1173	0	2577
Peak Hour: 7:00 AM to 8:00 AM																	
Total	1	3	0	10	0	0	0	0	17	0	650	98	12	32	635	0	1428
Approach	13				0				748				667				1428
%HV	7.7%				n/a				2.3%				1.8%				2.1%
PHF	0.65				n/a				0.93				0.86				0.94



1524 *1.0 PHF Peak Hour Volume*

	PHF	%HV
EB	0.86	1.8%
WB	0.93	2.3%
NB	n/a	n/a
SB	0.65	7.7%
T Int.	0.94	2.1%

Check In: 1428 Out: 1428

PEDs Across:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	**0**

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Conditions:

Special Notes

TSI19016TM_02a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

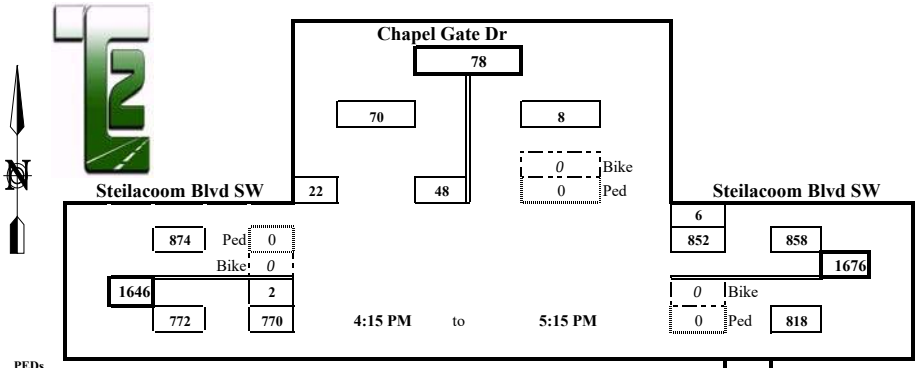
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Chapel Gate Dr & Steilacoom Blvd SW **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Chapel Gate Dr				From South on (NB) 0				From East on (WB) Steilacoom Blvd SW				From West on (EB) Steilacoom Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	22	0	2	0	0	0	0	2	0	188	2	2	0	156	0	370
4:30 P	0	19	0	5	0	0	0	0	1	0	228	1	2	0	162	0	415
4:45 P	0	14	0	10	0	0	0	0	1	0	206	0	2	0	208	0	438
5:00 P	0	6	0	3	0	0	0	0	1	0	200	0	2	1	194	0	404
5:15 P	0	9	0	4	0	0	0	0	3	0	218	5	1	1	206	0	443
5:30 P	0	6	0	2	0	0	0	0	0	0	196	0	1	1	178	0	383
5:45 P	0	6	0	3	0	0	0	0	1	0	239	0	2	0	161	0	409
6:00 P	0	0	0	2	0	0	0	0	1	0	206	1	0	0	178	0	387
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	82	0	31	0	0	0	0	10	0	1681	9	12	3	1443	0	3249
Peak Hour: 4:15 PM to 5:15 PM																	
Total	0	48	0	22	0	0	0	0	6	0	852	6	7	2	770	0	1700
Approach	70				0				858				772				1700
%HV	n/a				n/a				0.7%				0.9%				0.8%
PHF	0.73				n/a				0.94				0.93				0.96



1772 *1.0 PHF Peak Hour Volume*

PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

		PHF	%HV
	EB	0.93	0.9%
Check	WB	0.94	0.7%
In: 1700	NB	n/a	n/a
Out: 1700	SB	0.73	n/a
	T Int.	0.96	0.8%

Conditions:

Special Notes

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

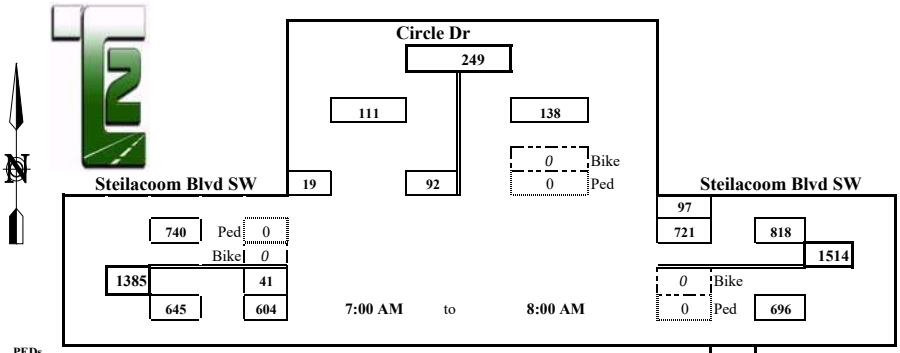
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Circle Dr & Steilacoom Blvd SW **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Circle Dr				From South on (NB) 0				From East on (WB) Steilacoom Blvd SW				From West on (EB) Steilacoom Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	70	0	15	0	0	0	0	5	0	183	28	2	7	134	0	437
7:30 A	0	9	0	2	0	0	0	0	4	0	204	24	4	8	167	0	414
7:45 A	0	8	0	2	0	0	0	0	4	0	141	27	5	13	174	0	365
8:00 A	0	5	0	0	0	0	0	0	6	0	193	18	1	13	129	0	358
8:15 A	0	5	0	0	0	0	0	0	3	0	119	10	5	8	133	0	275
8:30 A	0	4	0	0	0	0	0	0	1	0	129	17	3	12	127	0	289
8:45 A	0	6	0	2	0	0	0	0	5	0	145	8	2	4	100	0	265
9:00 A	0	5	0	1	0	0	0	0	2	0	190	12	0	9	148	0	365
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	112	0	22	0	0	0	0	30	0	1304	144	22	74	1112	0	2768
Peak Hour: 7:00 AM to 8:00 AM																	
Total	0	92	0	19	0	0	0	0	19	0	721	97	12	41	604	0	1574
Approach	111				0				818				645				1574
%HV	n/a				n/a				2.3%				1.9%				2.0%
PHF	0.33				n/a				0.90				0.86				0.90



1748 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.86	1.9%
Check	WB	0.90	2.3%
In: 1574	NB	n/a	n/a
Out: 1574	SB	0.33	n/a
	T Int.	0.90	2.0%

Conditions:

PEDs Across:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	**0**

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06		1			1
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	1	0	0	1

Special Notes

TSI19016TM_03a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

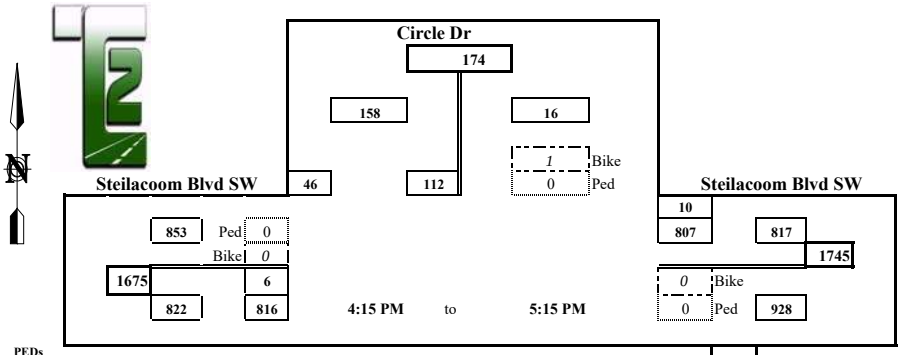
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Circle Dr & Steilacoom Blvd SW **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Circle Dr				From South on (NB) 0				From East on (WB) Steilacoom Blvd SW				From West on (EB) Steilacoom Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	34	0	11	0	0	0	0	2	0	180	5	1	2	178	0	410
4:30 P	0	32	0	15	0	0	0	0	1	0	216	5	2	0	185	0	453
4:45 P	0	38	0	17	0	0	0	0	1	0	190	3	2	3	220	0	471
5:00 P	0	16	0	8	0	0	0	0	1	0	184	2	2	2	196	0	408
5:15 P	0	26	0	6	0	0	0	0	3	0	217	0	1	1	215	0	465
5:30 P	0	14	0	3	0	0	0	0	0	0	207	2	1	1	182	0	409
5:45 P	0	6	0	4	0	0	0	0	1	0	225	1	2	0	162	0	398
6:00 P	0	12	0	4	0	0	0	0	1	0	201	1	0	0	180	0	398
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	178	0	68	0	0	0	0	10	0	1620	19	11	9	1518	0	3412
Peak Hour: 4:15 PM to 5:15 PM																	
Total	0	112	0	46	0	0	0	0	6	0	807	10	7	6	816	0	1797
Approach	158				0				817				822				1797
%HV	n/a				n/a				0.7%				0.9%				0.7%
PHF	0.72				n/a				0.92				0.92				0.95



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	**0**

Special Notes

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05	1				1
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	0	0	0	1

1884 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.92	0.9%
Check	WB	0.92	0.7%
In: 1797	NB	n/a	n/a
Out: 1797	SB	0.72	n/a
	T Int.	0.95	0.7%

Conditions:

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

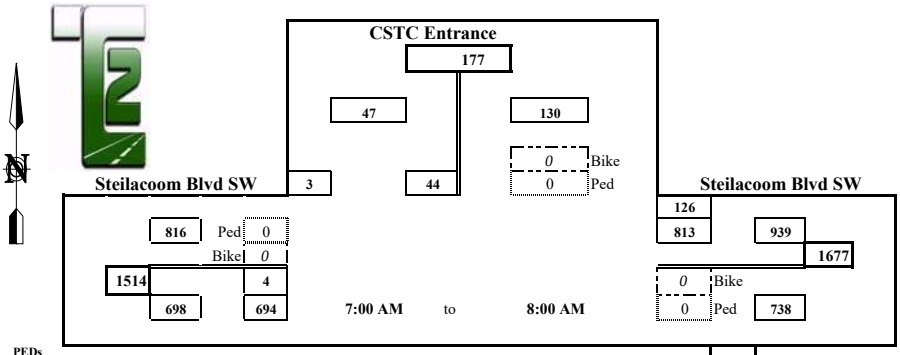
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: CSTC Entrance & Steilacoom Blvd SW **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) CSTC Entrance				From South on (NB) 0				From East on (WB) Steilacoom Blvd SW				From West on (EB) Steilacoom Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	33	0	2	0	0	0	0	4	0	211	28	4	1	207	0	482
7:30 A	0	6	0	1	0	0	0	0	4	0	241	27	3	0	169	0	444
7:45 A	0	4	0	0	0	0	0	0	4	0	161	31	5	3	176	0	375
8:00 A	0	1	0	0	0	0	0	0	4	0	200	40	2	0	142	0	383
8:15 A	0	4	0	0	0	0	0	0	3	0	131	34	5	0	136	0	305
8:30 A	0	4	0	0	0	0	0	0	2	0	149	25	3	1	134	0	313
8:45 A	0	2	0	0	0	0	0	0	5	0	167	16	2	0	109	0	294
9:00 A	1	3	0	0	0	0	0	0	2	0	192	8	0	1	143	0	347
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	57	0	3	0	0	0	0	28	0	1452	209	24	6	1216	0	2943
Peak Hour: 7:00 AM to 8:00 AM																	
Total	0	44	0	3	0	0	0	0	16	0	813	126	14	4	694	0	1684
Approach		47				0				939				698			1684
%HV		n/a				n/a				1.7%				2.0%			1.8%
PHF		0.34				n/a				0.88				0.84			0.87



1928 *1.0 PHF Peak Hour Volume*

	PHF	%HV
EB	0.84	2.0%
WB	0.88	1.7%
NB	n/a	n/a
SB	0.34	n/a
T Int.	0.87	1.8%

Check In: 1684 Out: 1684

PEDs Across:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	**0**

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

N U's	S U's	E U's	W U's
			0
			0
			0
			0
			0
			0
			0
			1
0	0	0	1

Special Notes

TSI19016TM_04a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

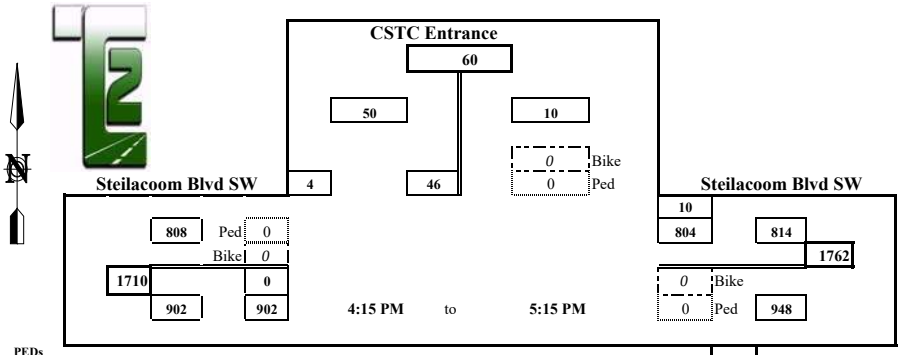
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: CSTC Entrance & Steilacoom Blvd SW **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) CSTC Entrance				From South on (NB) 0				From East on (WB) Steilacoom Blvd SW				From West on (EB) Steilacoom Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	14	0	1	0	0	0	0	2	0	193	5	1	0	218	0	431
4:30 P	0	11	0	2	0	0	0	0	1	0	211	4	2	0	207	0	435
4:45 P	0	18	0	1	0	0	0	0	1	0	186	1	1	0	247	0	453
5:00 P	0	7	0	0	0	0	0	0	1	0	185	2	3	0	215	0	409
5:15 P	0	10	0	1	0	0	0	0	3	0	222	3	1	0	233	0	469
5:30 P	0	7	0	0	0	0	0	0	1	0	204	0	1	0	199	0	410
5:45 P	0	11	0	0	0	0	0	0	0	0	219	3	2	0	172	0	405
6:00 P	0	4	0	1	0	0	0	0	1	0	199	1	0	0	194	0	399
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	82	0	6	0	0	0	0	10	0	1619	19	11	0	1685	0	3411
Peak Hour: 4:15 PM to 5:15 PM																	
Total	0	46	0	4	0	0	0	0	6	0	804	10	7	0	902	0	1766
Approach	50				0				814				902				1766
%HV	n/a				n/a				0.7%				0.8%				0.7%
PHF	0.66				n/a				0.90				0.91				0.94



PEDs Across:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	**0**

Special Notes

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

1876 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.91	0.8%
Check	WB	0.90	0.7%
In: 1766	NB	n/a	n/a
Out: 1766	SB	0.66	n/a
	T Int.	0.94	0.7%

N U's	S U's	E U's	W U's
		1	0
		0	1
		0	0
		0	0
		0	0
		0	0
		0	0
		0	0
0	0	1	1

TSI19016TM_04p

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

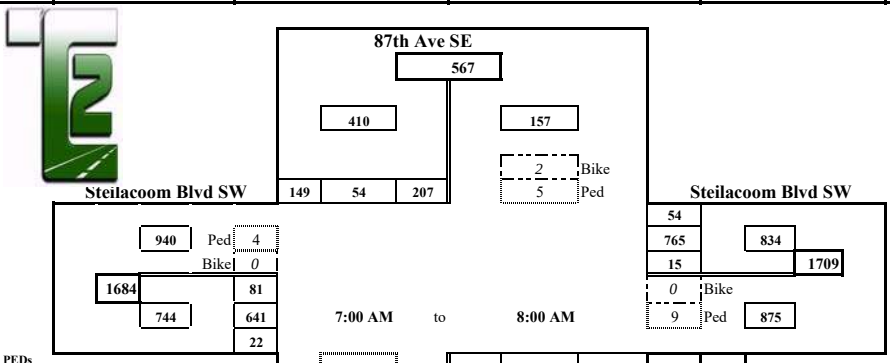
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 87th Ave SE & Steilacoom Blvd SW **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) 87th Ave SE				From South on (NB) 87th Ave SE				From East on (WB) Steilacoom Blvd SW				From West on (EB) Steilacoom Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	52	22	40	0	8	2	4	5	2	187	5	4	27	207	6	562
7:30 A	3	54	13	40	0	3	2	4	3	5	211	16	3	22	147	6	523
7:45 A	0	52	12	32	1	11	7	10	5	3	172	15	5	15	162	9	500
8:00 A	1	49	7	37	0	4	11	9	3	5	195	18	2	17	125	1	478
8:15 A	1	43	8	22	1	6	10	7	8	8	140	29	5	20	118	1	412
8:30 A	3	57	5	35	2	3	12	6	2	11	152	22	5	24	111	6	444
8:45 A	2	65	23	36	0	0	3	5	6	14	141	21	2	12	93	4	417
9:00 A	0	37	8	34	0	4	4	10	2	11	157	28	1	17	132	0	442
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	10	409	98	276	4	39	51	55	34	59	1355	154	27	154	1095	33	3778
Peak Hour: 7:00 AM to 8:00 AM																	
Total	4	207	54	149	1	26	22	27	16	15	765	54	14	81	641	22	2063
Approach	410				75				834				744				2063
%HV	1.0%				1.3%				1.9%				1.9%				1.7%
PHF	0.90				0.67				0.90				0.78				0.92



PEDs Across:	N	S	E	W	
INT 01			1	1	2
INT 02	2		2	2	6
INT 03	3	1	3	1	8
INT 04		3	3		6
INT 05		3	3	1	7
INT 06		3	3		6
INT 07		3	2	1	6
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	5	13	17	6	41

Bicycles From:	N	S	E	W	
INT 01					0
INT 02	1				1
INT 03					0
INT 04	1				1
INT 05		1			1
INT 06					0
INT 07	2				2
INT 08		2	1		3
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	4	3	1	0	8

2248 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.78	1.9%
Check	WB	0.90	1.9%
In: 2063	NB	0.67	1.3%
Out: 2063	SB	0.90	1.0%
	T Int.	0.92	1.7%

Conditions:

Special Notes

TSI19016TM_05a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

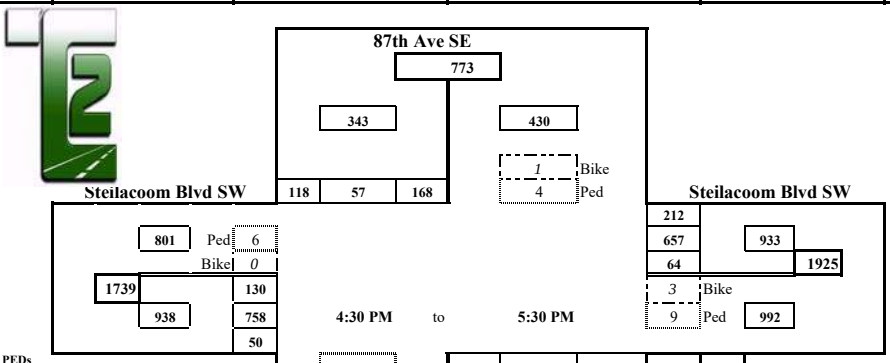
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 87th Ave SE & Steilacoom Blvd SW **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) 87th Ave SE				From South on (NB) 87th Ave SE				From East on (WB) Steilacoom Blvd SW				From West on (EB) Steilacoom Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	36	20	31	2	5	16	17	0	17	162	57	2	22	200	8	591
4:30 P	1	51	7	27	0	2	11	6	1	9	187	56	2	32	182	6	576
4:45 P	1	40	15	28	0	9	23	11	2	16	150	47	0	34	218	13	604
5:00 P	0	38	12	37	0	4	21	15	2	14	146	48	4	28	181	13	557
5:15 P	1	32	13	27	0	10	20	17	1	15	186	60	1	34	199	12	625
5:30 P	0	58	17	26	0	3	24	23	1	19	175	57	3	34	160	12	608
5:45 P	0	42	16	23	0	9	15	14	0	14	190	60	2	34	138	11	566
6:00 P	0	47	11	30	0	15	21	24	1	24	155	47	0	40	150	8	572
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	5	344	111	229	2	57	151	127	8	128	1351	432	14	258	1428	83	4699
	Peak Hour: 4:30 PM to 5:30 PM																
Total	2	168	57	118	0	26	88	66	6	64	657	212	8	130	758	50	2394
Approach	343				180				933				938				2394
%HV	0.6%				n/a				0.6%				0.9%				0.7%
PHF	0.85				0.90				0.89				0.88				0.96



PEDs Across:	N	S	E	W	
INT 01	1			1	2
INT 02	6		1	2	9
INT 03	2	1	1	3	7
INT 04	2	3	1	2	8
INT 05			1	1	2
INT 06			6		6
INT 07		2	3		5
INT 08	4		5	1	10
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	15	6	18	10	49

Bicycles From:	N	S	E	W	
INT 01					0
INT 02				1	1
INT 03			1		1
INT 04		1			1
INT 05		5	1		6
INT 06	1	2	1		4
INT 07	2	2	2		6
INT 08			2		2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	3	10	7	1	21

2500 *1.0 PHF Peak Hour Volume*

	PHF	%HV
EB	0.88	0.9%
WB	0.89	0.6%
NB	0.90	n/a
SB	0.85	0.6%
T Int.	0.96	0.7%

Check In: 2394 Out: 2394

Conditions:

Special Notes

TSI19016TM_05p

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

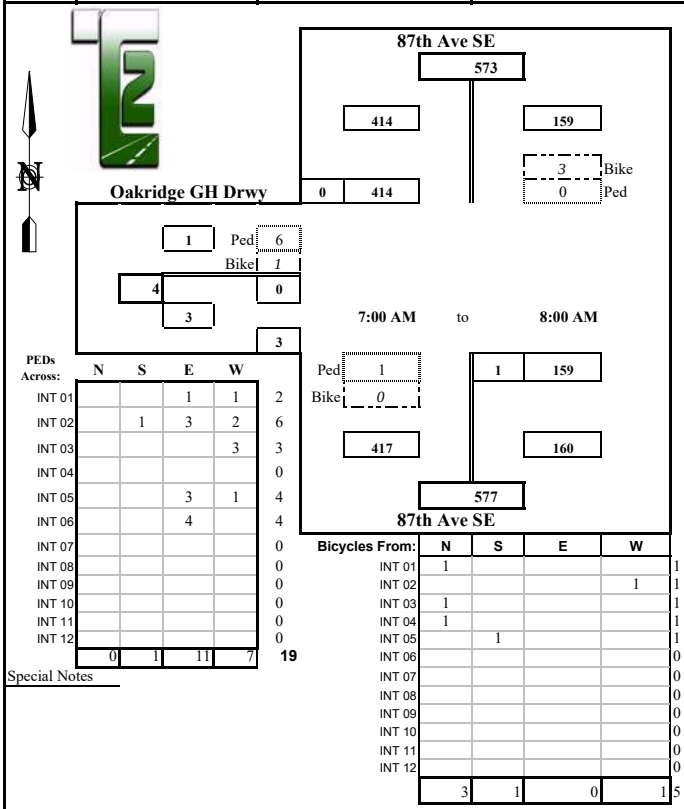
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 87th Ave SE & Oakridge Group Home Drwy **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) 87th Ave SE				From South on (NB) 87th Ave SE				From East on (WB) 0				From West on (EB) Oakridge GH Drwy				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	0	120	0	2	0	32	0	0	0	0	0	0	0	0	2	154
7:30 A	2	0	106	0	4	1	40	0	0	0	0	0	0	0	0	0	147
7:45 A	0	0	96	0	1	0	41	0	0	0	0	0	0	0	0	0	137
8:00 A	1	0	92	0	0	0	46	0	0	0	0	0	0	0	0	1	139
8:15 A	1	0	59	0	3	1	54	0	0	0	0	0	0	0	0	0	114
8:30 A	0	0	66	0	1	1	46	0	0	0	0	0	0	0	0	1	114
8:45 A	2	0	86	0	1	2	29	0	0	0	0	0	0	0	0	2	119
9:00 A	0	0	44	1	0	3	24	0	0	0	0	0	0	0	0	2	74
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	6	0	669	1	12	8	312	0	0	0	0	0	0	0	0	8	998
Peak Hour: 7:00 AM to 8:00 AM																	
Total	3	0	414	0	7	1	159	0	0	0	0	0	0	0	0	3	577
Approach			414				160				0				3		577
%HV			0.7%				4.4%				n/a				n/a		1.7%
PHF			0.86				0.87				n/a				0.38		0.94



PEDs Across:	N	S	E	W	
INT 01			1	1	2
INT 02		1	3	2	6
INT 03				3	3
INT 04					0
INT 05			3	1	4
INT 06			4		4
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	1	11	7	19

Bicycles From:	N	S	E	W	
INT 01	1				1
INT 02				1	1
INT 03	1				1
INT 04	1				1
INT 05		1			1
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	3	1	0	1	5

Special Notes

616 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.38	n/a
Check	WB	n/a	n/a
In: 577	NB	0.87	4.4%
Out: 577	SB	0.86	0.7%
	T Int.	0.94	1.7%

Conditions:

TSI19016TM_06a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

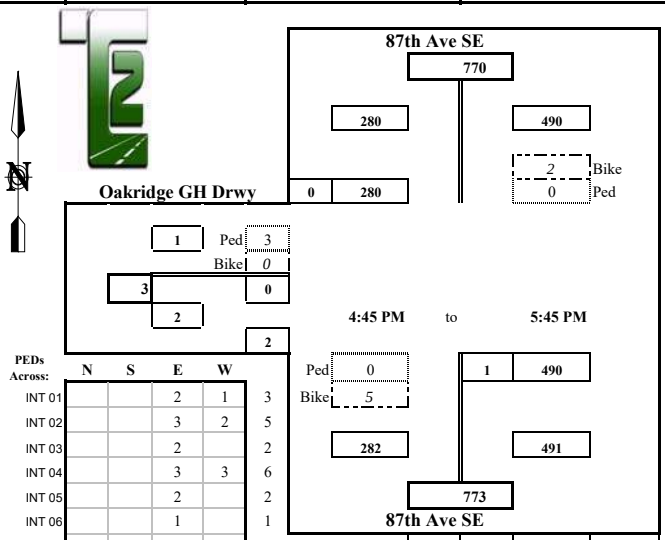
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 87th Ave SE & Oakridge Group Home Drwy **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) 87th Ave SE				From South on (NB) 87th Ave SE				From East on (WB) 0				From West on (EB) Oakridge GH Drwy				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	0	82	0	1	2	92	0	0	0	0	0	0	0	0	1	177
4:30 P	1	0	56	0	0	0	110	0	0	0	0	0	0	0	0	1	167
4:45 P	1	0	71	0	0	0	102	0	0	0	0	0	0	0	0	2	175
5:00 P	0	0	71	0	1	0	116	0	0	0	0	0	0	0	0	0	187
5:15 P	1	0	51	0	0	0	135	0	0	0	0	0	0	0	0	1	187
5:30 P	0	0	83	0	0	0	127	0	0	0	0	0	0	0	0	1	211
5:45 P	0	0	75	0	0	1	112	0	0	0	0	0	0	0	0	0	188
6:00 P	0	0	79	0	0	2	106	0	0	0	0	0	0	0	0	0	187
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	5	0	568	0	2	5	900	0	0	0	0	0	0	0	0	6	1479
Peak Hour: 4:45 PM to 5:45 PM																	
Total	1	0	280	0	1	1	490	0	0	0	0	0	0	0	0	2	773
Approach			280				491				0				2		773
%HV			0.4%				0.2%				n/a				n/a		0.3%
PHF			0.84				0.91				n/a				0.50		0.92



PEDs Across:	N	S	E	W	
INT 01			2	1	3
INT 02			3	2	5
INT 03			2		2
INT 04			3	3	6
INT 05			2		2
INT 06			1		1
INT 07			2		2
INT 08			5	1	6
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	20	7	27

Bicycles From:	N	S	E	W	
INT 01	1	1			2
INT 02					0
INT 03					0
INT 04					0
INT 05	1	2			3
INT 06	1	1			2
INT 07		2			2
INT 08	1				1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	4	6	0	0	10

Special Notes

844 *1.0 PHF Peak Hour Volume*

			PHF	%HV
		EB	0.50	n/a
Check		WB	n/a	n/a
In:	773	NB	0.91	0.2%
Out:	773	SB	0.84	0.4%
		T Int.	0.92	0.3%

Conditions:

TSI19016TM_06p

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

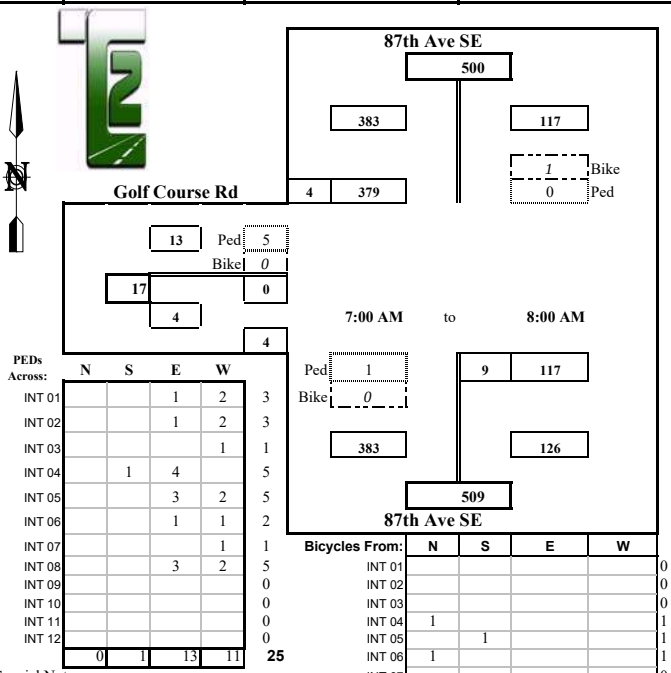
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 87th Ave SE & Golf Course Rd **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) 87th Ave SE				From South on (NB) 87th Ave SE				From East on (WB) 0				From West on (EB) Golf Course Rd				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	0	114	1	2	2	27	0	0	0	0	0	0	0	0	2	146
7:30 A	2	0	95	0	4	2	33	0	0	0	0	0	0	0	0	0	130
7:45 A	0	0	85	1	1	4	26	0	0	0	0	0	0	0	0	0	116
8:00 A	1	0	85	2	0	1	31	0	0	0	0	0	0	0	0	2	121
8:15 A	1	0	64	0	4	1	50	0	0	0	0	0	0	0	0	1	116
8:30 A	1	0	68	1	1	1	47	0	0	0	0	0	0	0	0	0	117
8:45 A	2	0	79	0	1	2	31	0	0	0	0	0	0	0	0	0	112
9:00 A	0	0	75	0	0	2	29	0	0	0	0	0	0	0	0	0	106
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	7	0	665	5	13	15	274	0	0	0	0	0	0	0	0	5	964
Peak Hour: 7:00 AM to 8:00 AM																	
Total	3	0	379	4	7	9	117	0	0	0	0	0	0	0	0	4	513
Approach	383				126				0				4				513
%HV	0.8%				5.6%				n/a				n/a				1.9%
PHF	0.83				0.90				n/a				0.50				0.88



PEDs Across:	N	S	E	W	
INT 01			1	2	3
INT 02			1	2	3
INT 03				1	1
INT 04		1	4		5
INT 05			3	2	5
INT 06			1	1	2
INT 07				1	1
INT 08			3	2	5
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	1	13	11	25

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04	1				1
INT 05		1			1
INT 06	1				1
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	2	1	0	0	3

584 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.50	n/a
Check	WB	n/a	n/a
In: 513	NB	0.90	5.6%
Out: 513	SB	0.83	0.8%
	T Int.	0.88	1.9%

Conditions:

Special Notes

TSI19016TM_07a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

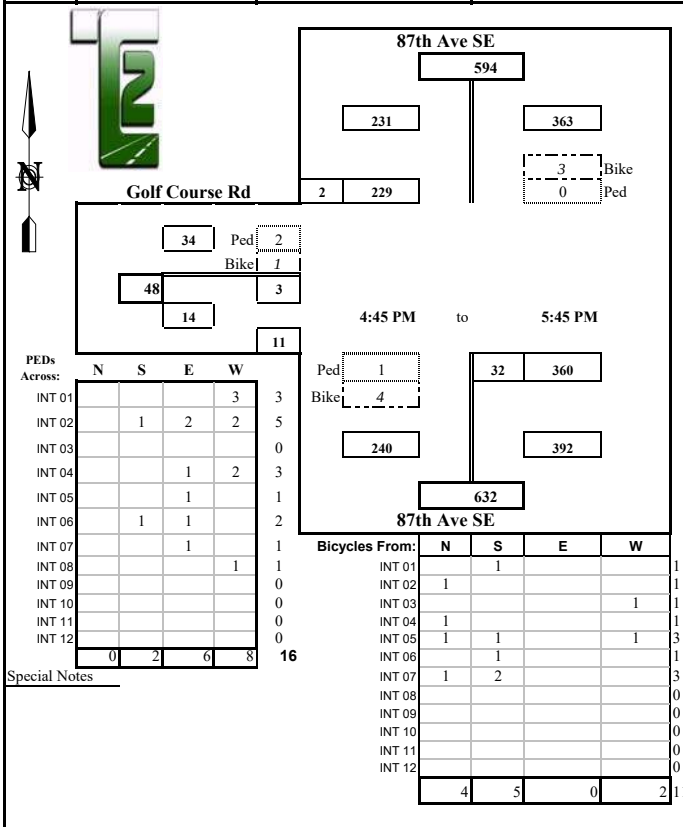
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 87th Ave SE & Golf Course Rd **Date of Count:** Thurs 5/30/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) 87th Ave SE				From South on (NB) 87th Ave SE				From East on (WB) 0				From West on (EB) Golf Course Rd				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	0	62	0	1	6	78	0	0	0	0	0	0	1	0	4	151
4:30 P	1	0	54	0	0	4	96	0	0	0	0	0	0	0	0	2	156
4:45 P	1	0	55	0	0	9	85	0	0	0	0	0	0	1	0	4	154
5:00 P	0	0	58	0	1	9	82	0	0	0	0	0	0	1	0	5	155
5:15 P	1	0	47	1	0	10	93	0	0	0	0	0	0	0	0	1	152
5:30 P	0	0	65	0	0	8	92	0	0	0	0	0	0	1	0	3	169
5:45 P	0	0	59	1	0	5	93	0	0	0	0	0	0	1	0	2	161
6:00 P	0	0	59	0	0	8	74	0	0	0	0	0	0	0	0	6	147
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	4	0	459	2	2	59	693	0	0	0	0	0	0	5	0	27	1245
	Peak Hour: 4:45 PM to 5:45 PM																
Total	1	0	229	2	1	32	360	0	0	0	0	0	0	3	0	11	637
Approach	231				392				0				14				637
%HV	0.4%				0.3%				n/a				n/a				0.3%
PHF	0.89				0.95				n/a				0.58				0.94



PEDs Across:	N	S	E	W	
INT 01				3	3
INT 02		1	2	2	5
INT 03					0
INT 04			1	2	3
INT 05			1		1
INT 06		1	1		2
INT 07			1		1
INT 08				1	1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	2	6	8	16

Bicycles From:	N	S	E	W	
INT 01		1			1
INT 02	1				1
INT 03				1	1
INT 04	1				1
INT 05	1	1		1	3
INT 06		1			1
INT 07	1	2			3
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	4	5	0	2	11

676 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.58	n/a
Check	WB	n/a	n/a
In: 637	NB	0.95	0.3%
Out: 637	SB	0.89	0.4%
	T Int.	0.94	0.3%

Conditions:

Special Notes

TSI19016TM_07p

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

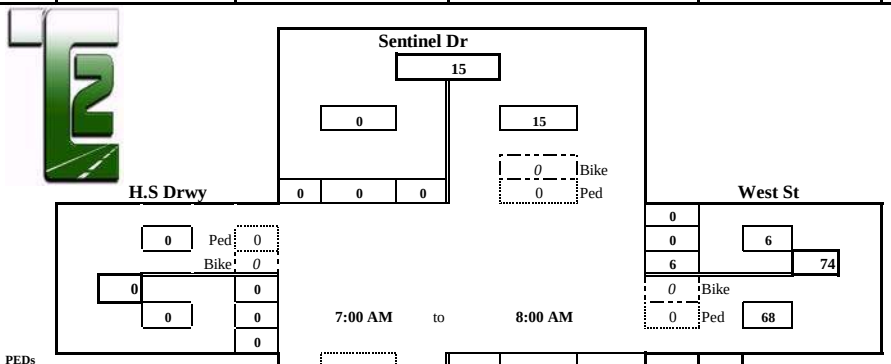
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sentinel Dr & West St/H.S Drwy **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sentinel Dr				From South on (NB) Sentinel Dr				From East on (WB) West St				From West on (EB) H.S Drwy				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	0	0	0	1	0	1	12	0	1	0	0	0	0	0	0	14
7:30 A	0	0	0	0	1	0	0	9	0	1	0	0	0	0	0	0	10
7:45 A	0	0	0	0	0	0	1	21	1	2	0	0	0	0	0	0	24
8:00 A	0	0	0	0	0	0	13	26	1	2	0	0	0	0	0	0	41
8:15 A	0	0	1	0	0	0	3	1	0	1	0	0	0	0	0	1	7
8:30 A	0	0	0	0	0	0	0	5	1	4	0	0	0	0	0	0	9
8:45 A	0	0	0	0	1	0	0	2	0	1	0	0	0	0	0	0	3
9:00 A	0	0	0	0	1	0	3	4	1	1	0	0	0	0	0	0	8
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	1	0	4	0	21	80	4	13	0	0	0	0	0	1	116
Peak Hour: 7:00 AM to 8:00 AM																	
Total	0	0	0	0	2	0	15	68	2	6	0	0	0	0	0	0	89
Approach	0				83				6				0				89
%HV	n/a				2.4%				33.3%				n/a				4.5%
PHF	n/a				0.53				0.75				n/a				0.54



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05		1			1
INT 06		1			1
INT 07					0
INT 08		3			3
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	5	0	0	5

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

164 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	n/a	n/a
Check	WB	0.75	33.3%
In: 89	NB	0.53	2.4%
Out: 89	SB	n/a	n/a
	T Int.	0.54	4.5%

Conditions:

Special Notes

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

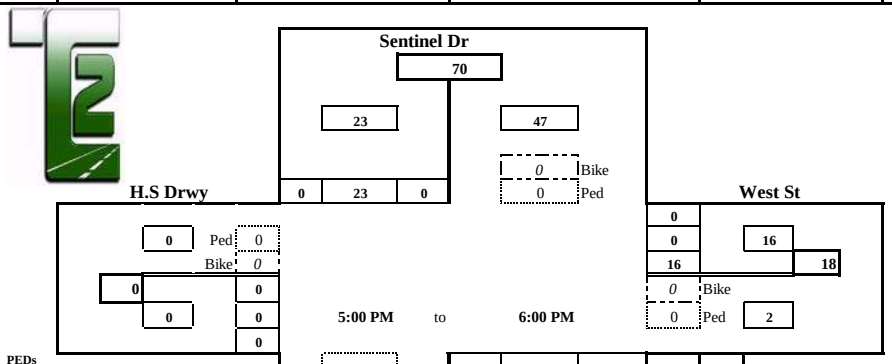
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sentinel Dr & West St/H.S Drwy **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Sentinel Dr				From South on (NB) Sentinel Dr				From East on (WB) West St				From West on (EB) H.S Drwy				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	2	0	0	0	3	1	0	16	0	0	0	0	0	0	22
4:30 P	0	0	0	0	0	0	1	0	0	16	0	0	0	0	0	0	17
4:45 P	0	0	1	0	2	0	3	4	0	17	0	0	0	0	0	0	25
5:00 P	0	0	0	0	0	0	1	2	2	4	0	0	0	0	0	0	7
5:15 P	0	0	1	0	0	0	2	1	0	7	0	0	0	0	0	0	11
5:30 P	0	0	8	0	0	0	13	0	0	3	0	0	0	0	0	0	24
5:45 P	0	0	2	0	0	0	14	0	0	2	0	0	0	0	0	0	18
6:00 P	0	0	12	0	0	0	18	1	0	4	0	0	0	0	0	0	35
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	26	0	2	0	55	9	2	69	0	0	0	0	0	0	159
Peak Hour: 5:00 PM to 6:00 PM																	
Total	0	0	23	0	0	0	47	2	0	16	0	0	0	0	0	0	88
Approach			23				49				16				0		88
%HV			n/a				n/a				n/a				n/a		0.0%
PHF			0.48				0.64				0.57				n/a		0.63



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04			1		1
INT 05		1			1
INT 06					0
INT 07		2			2
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	3	1	0	4

Bicycles From:	N	S	E	W	
INT 01	1	1	1		3
INT 02					0
INT 03					0
INT 04		1			1
INT 05					0
INT 06					0
INT 07		1			1
INT 08		1			1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	4	1	0	6

140 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	n/a	n/a
Check	WB	0.57	n/a
In: 88	NB	0.64	n/a
Out: 88	SB	0.48	n/a
	T Int.	0.63	0.0%

Conditions:

Special Notes

TSI19016TM_08p

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

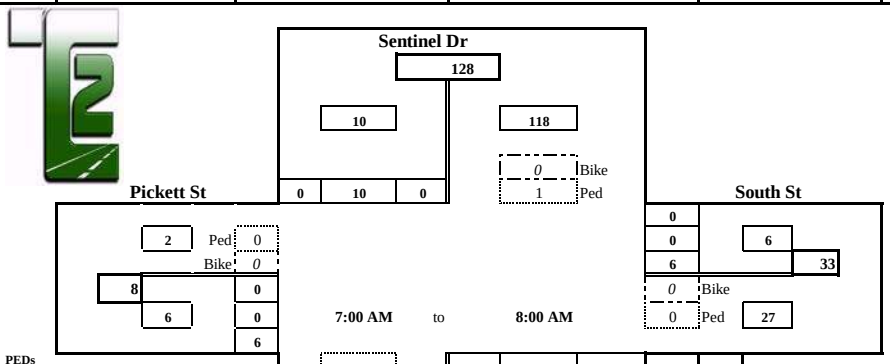
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sentinel Dr & South St/Pickett St **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sentinel Dr				From South on (NB) Sentinel Dr				From East on (WB) South St				From West on (EB) Pickett St				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	1	0	1	0	1	0	13	6	0	5	0	0	0	0	0	1	26
7:30 A	0	0	2	0	1	0	16	10	0	0	0	0	0	0	0	1	29
7:45 A	1	0	2	0	0	0	27	6	0	0	0	0	1	0	0	1	36
8:00 A	1	0	5	0	1	2	62	5	0	1	0	0	0	0	0	3	78
8:15 A	0	0	2	0	0	1	11	2	0	0	0	0	0	0	0	1	17
8:30 A	1	0	4	0	0	0	7	0	0	1	0	0	0	0	0	1	13
8:45 A	0	0	0	0	1	0	4	4	0	0	0	0	0	0	0	0	8
9:00 A	1	0	3	0	1	0	8	3	0	0	0	0	0	0	0	0	14
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	5	0	19	0	5	3	148	36	0	7	0	0	1	0	0	8	221
Peak Hour: 7:00 AM to 8:00 AM																	
Total	3	0	10	0	3	2	118	27	0	6	0	0	1	0	0	6	169
Approach	10				147				6				6				169
%HV	30.0%				2.0%				n/a				16.7%				4.1%
PHF	0.50				0.53				0.30				0.50				0.54



312 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.50	16.7%
Check	WB	0.30	n/a
In: 169	NB	0.53	2.0%
Out: 169	SB	0.50	30.0%
	T Int.	0.54	4.1%

Conditions:

PEDs Across:

	N	S	E	W	
INT 01		3			3
INT 02					0
INT 03					0
INT 04	1				1
INT 05	7	2			9
INT 06		1			1
INT 07					0
INT 08		4			4
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	8	10	0	0	18

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Special Notes

TSI19016TM_09a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

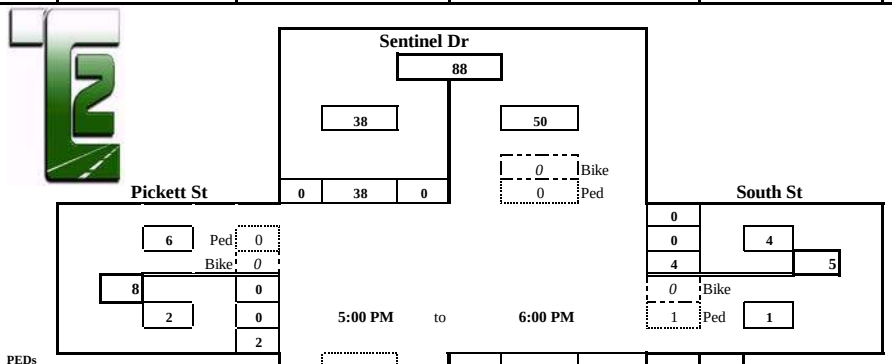
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sentinel Dr & South St/Pickett St **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sentinel Dr				From South on (NB) Sentinel Dr				From East on (WB) South St				From West on (EB) Pickett St				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	19	0	0	1	4	1	0	1	0	0	0	0	0	1	27
4:30 P	0	0	16	0	0	1	1	1	0	3	0	0	0	0	0	0	22
4:45 P	0	0	19	0	2	0	7	0	0	3	0	0	0	0	0	1	30
5:00 P	2	0	3	0	0	1	2	1	0	3	0	0	0	0	0	1	11
5:15 P	0	0	8	0	0	0	5	1	0	4	0	0	0	0	0	0	18
5:30 P	0	0	10	0	0	2	13	0	0	0	0	0	0	0	0	1	26
5:45 P	0	0	6	0	0	3	14	0	0	0	0	0	0	0	0	0	23
6:00 P	0	0	14	0	0	1	18	0	0	0	0	0	0	0	0	1	34
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	0	95	0	2	9	64	4	0	14	0	0	0	0	0	5	191
	Peak Hour: 5:00 PM to 6:00 PM																
Total	0	0	38	0	0	6	50	1	0	4	0	0	0	0	0	2	101
Approach			38				57				4				2		101
%HV			n/a				n/a				n/a				n/a		0.0%
PHF			0.68				0.75				0.25				0.50		0.74



PEDs Across:	N	S	E	W	
INT 01		1			1
INT 02	2		3		5
INT 03			1	2	3
INT 04	1	1		1	3
INT 05			1		1
INT 06		2			2
INT 07		2			2
INT 08		1			1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	3	7	5	3	18

Bicycles From:	N	S	E	W	
INT 01					0
INT 02			1		1
INT 03					0
INT 04		2			2
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	2	1	0	3

136 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.50	n/a
Check	WB	0.25	n/a
In: 101	NB	0.75	n/a
Out: 101	SB	0.68	n/a
	T Int.	0.74	0.0%

Conditions:

Special Notes

TSI19016TM_09p

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

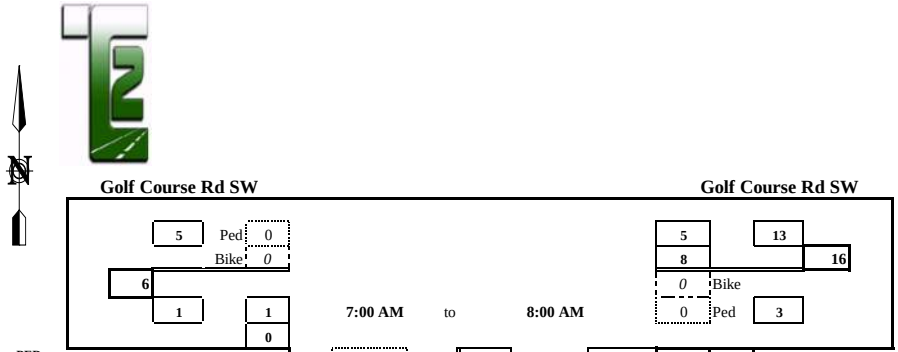
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Kids First Pl & Golf Course Rd SW **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) 0				From South on (NB) Kids First Pl				From East on (WB) Golf Course Rd SW				From West on (EB) Golf Course Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	0	0	0	0	0	0	2	0	3	2	0	0	0	0	0	7
7:30 A	0	0	0	0	0	0	0	0	0	2	1	0	0	0	1	0	4
7:45 A	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	3
8:00 A	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
8:15 A	0	0	0	0	0	0	0	1	0	2	1	0	0	0	1	0	5
8:30 A	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
8:45 A	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	3
9:00 A	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	0	0	0	4	0	15	8	0	0	0	2	0	29
	Peak Hour: 7:00 AM to 8:00 AM																
Total	0	0	0	0	0	0	0	2	0	8	5	0	0	0	1	0	16
Approach	0				2				13				1				16
%HV	n/a				n/a				n/a				n/a				0.0%
PHF	n/a				0.25				0.65				0.25				0.57



PEDs Across:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06				1	1
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	1	1

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

28 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.25	n/a
Check	WB	0.65	n/a
In: 16	NB	0.25	n/a
Out: 16	SB	n/a	n/a
	T Int.	0.57	0.0%

Conditions:

Special Notes

TSI19016TM_10a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

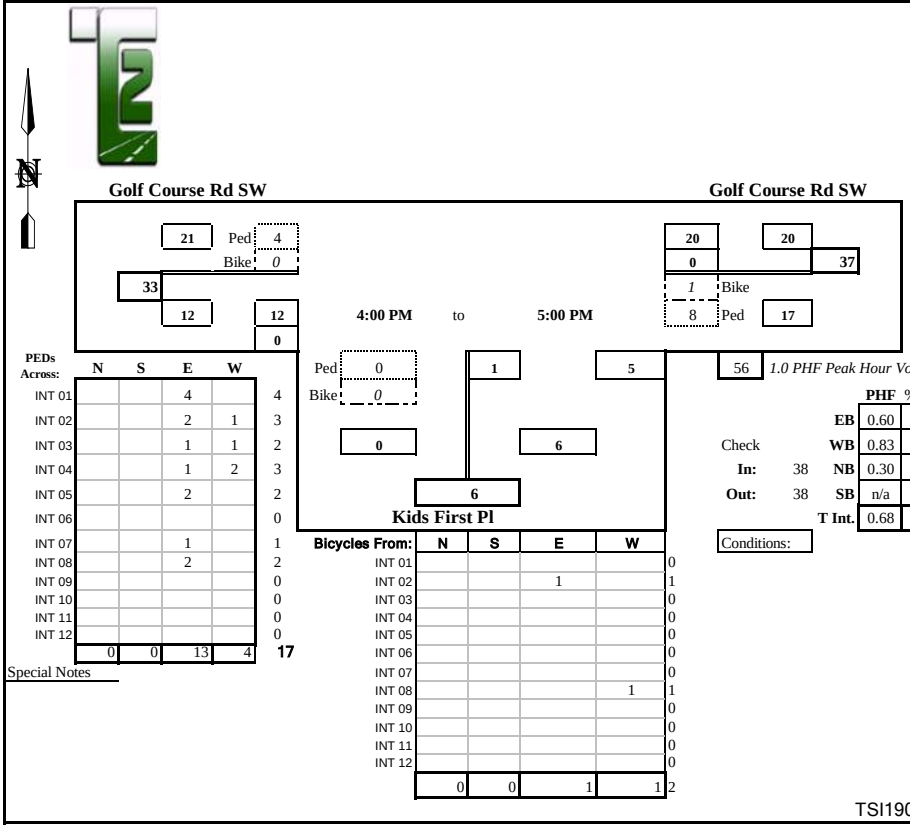
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Kids First Pl & Golf Course Rd SW **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) 0				From South on (NB) Kids First Pl				From East on (WB) Golf Course Rd SW				From West on (EB) Golf Course Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	0	1	0	4	0	0	6	0	0	0	3	0	14
4:30 P	0	0	0	0	0	0	0	1	0	0	6	0	0	0	2	0	9
4:45 P	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	5
5:00 P	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	10
5:15 P	0	0	0	0	0	0	0	2	0	0	8	0	0	0	2	0	12
5:30 P	0	0	0	0	0	0	0	1	0	0	5	0	0	0	2	0	8
5:45 P	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
6:00 P	0	0	0	0	0	0	0	0	0	0	2	0	1	0	10	0	12
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	0	1	0	8	0	0	37	0	1	0	27	0	73
	Peak Hour: 4:00 PM to 5:00 PM																
Total	0	0	0	0	0	1	0	5	0	0	20	0	0	0	12	0	38
Approach	0				6				20				12				38
%HV	n/a				n/a				n/a				n/a				0.0%
PHF	n/a				0.30				0.83				0.60				0.68



PEDs Across:

	N	S	E	W	
INT 01			4		4
INT 02			2	1	3
INT 03			1	1	2
INT 04			1	2	3
INT 05			2		2
INT 06					0
INT 07			1		1
INT 08			2		2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	13	4	17

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02			1		1
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08				1	1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	1	1	2

56 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.60	n/a
Check	WB	0.83	n/a
In: 38	NB	0.30	n/a
Out: 38	SB	n/a	n/a
	T Int.	0.68	0.0%

Conditions:

Special Notes

TSI19016TM_10p

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

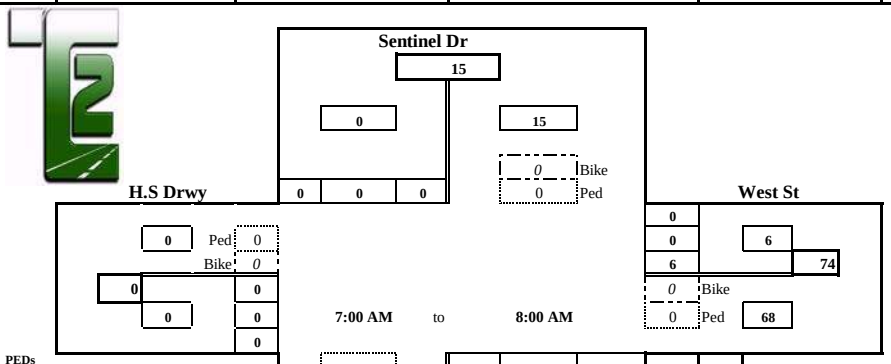
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sentinel Dr & West St/H.S Drwy **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sentinel Dr				From South on (NB) Sentinel Dr				From East on (WB) West St				From West on (EB) H.S Drwy				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	0	0	0	1	0	1	12	0	1	0	0	0	0	0	0	14
7:30 A	0	0	0	0	1	0	0	9	0	1	0	0	0	0	0	0	10
7:45 A	0	0	0	0	0	0	1	21	1	2	0	0	0	0	0	0	24
8:00 A	0	0	0	0	0	0	13	26	1	2	0	0	0	0	0	0	41
8:15 A	0	0	1	0	0	0	3	1	0	1	0	0	0	0	0	1	7
8:30 A	0	0	0	0	0	0	0	5	1	4	0	0	0	0	0	0	9
8:45 A	0	0	0	0	1	0	0	2	0	1	0	0	0	0	0	0	3
9:00 A	0	0	0	0	1	0	3	4	1	1	0	0	0	0	0	0	8
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	1	0	4	0	21	80	4	13	0	0	0	0	0	1	116
Peak Hour: 7:00 AM to 8:00 AM																	
Total	0	0	0	0	2	0	15	68	2	6	0	0	0	0	0	0	89
Approach	0				83				6				0				89
%HV	n/a				2.4%				33.3%				n/a				4.5%
PHF	n/a				0.53				0.75				n/a				0.54



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05		1			1
INT 06		1			1
INT 07					0
INT 08		3			3
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	5	0	0	5

Bicycles From:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

164 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	n/a	n/a
Check	WB	0.75	33.3%
In: 89	NB	0.53	2.4%
Out: 89	SB	n/a	n/a
	T Int.	0.54	4.5%

Conditions:

Special Notes

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

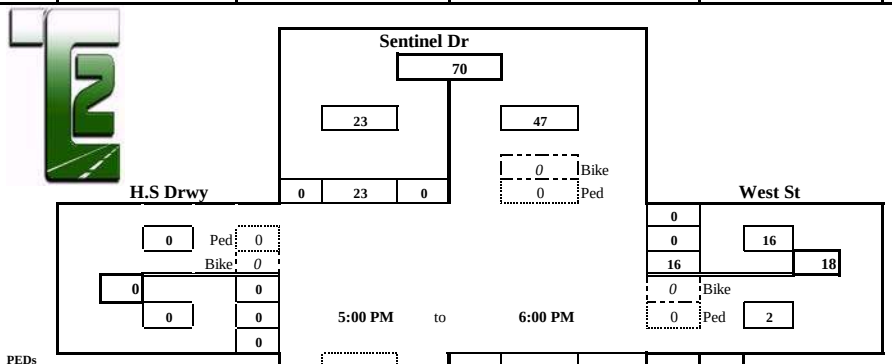
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sentinel Dr & West St/H.S Drwy **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Sentinel Dr				From South on (NB) Sentinel Dr				From East on (WB) West St				From West on (EB) H.S Drwy				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	2	0	0	0	3	1	0	16	0	0	0	0	0	0	22
4:30 P	0	0	0	0	0	0	1	0	0	16	0	0	0	0	0	0	17
4:45 P	0	0	1	0	2	0	3	4	0	17	0	0	0	0	0	0	25
5:00 P	0	0	0	0	0	0	1	2	2	4	0	0	0	0	0	0	7
5:15 P	0	0	1	0	0	0	2	1	0	7	0	0	0	0	0	0	11
5:30 P	0	0	8	0	0	0	13	0	0	3	0	0	0	0	0	0	24
5:45 P	0	0	2	0	0	0	14	0	0	2	0	0	0	0	0	0	18
6:00 P	0	0	12	0	0	0	18	1	0	4	0	0	0	0	0	0	35
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	26	0	2	0	55	9	2	69	0	0	0	0	0	0	159
Peak Hour: 5:00 PM to 6:00 PM																	
Total	0	0	23	0	0	0	47	2	0	16	0	0	0	0	0	0	88
Approach			23				49				16				0		88
%HV			n/a				n/a				n/a				n/a		0.0%
PHF			0.48				0.64				0.57				n/a		0.63



PEDs Across:	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04			1		1
INT 05		1			1
INT 06					0
INT 07		2			2
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	3	1	0	4

Bicycles From:	N	S	E	W	
INT 01	1	1	1		3
INT 02					0
INT 03					0
INT 04		1			1
INT 05					0
INT 06					0
INT 07		1			1
INT 08		1			1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	4	1	0	6

140 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	n/a	n/a
Check	WB	0.57	n/a
In: 88	NB	0.64	n/a
Out: 88	SB	0.48	n/a
	T Int.	0.63	0.0%

Conditions:

Special Notes

TSI19016TM_08p

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

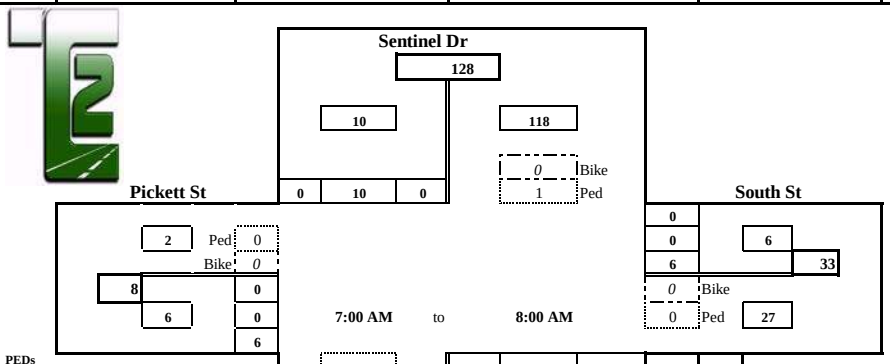
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sentinel Dr & South St/Pickett St **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sentinel Dr				From South on (NB) Sentinel Dr				From East on (WB) South St				From West on (EB) Pickett St				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	1	0	1	0	1	0	13	6	0	5	0	0	0	0	0	1	26
7:30 A	0	0	2	0	1	0	16	10	0	0	0	0	0	0	0	1	29
7:45 A	1	0	2	0	0	0	27	6	0	0	0	0	1	0	0	1	36
8:00 A	1	0	5	0	1	2	62	5	0	1	0	0	0	0	0	3	78
8:15 A	0	0	2	0	0	1	11	2	0	0	0	0	0	0	0	1	17
8:30 A	1	0	4	0	0	0	7	0	0	1	0	0	0	0	0	1	13
8:45 A	0	0	0	0	1	0	4	4	0	0	0	0	0	0	0	0	8
9:00 A	1	0	3	0	1	0	8	3	0	0	0	0	0	0	0	0	14
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	5	0	19	0	5	3	148	36	0	7	0	0	1	0	0	8	221
Peak Hour: 7:00 AM to 8:00 AM																	
Total	3	0	10	0	3	2	118	27	0	6	0	0	1	0	0	6	169
Approach	10				147				6				6				169
%HV	30.0%				2.0%				n/a				16.7%				4.1%
PHF	0.50				0.53				0.30				0.50				0.54



312 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.50	16.7%
Check	WB	0.30	n/a
In: 169	NB	0.53	2.0%
Out: 169	SB	0.50	30.0%
	T Int.	0.54	4.1%

Conditions:

PEDs Across:

	N	S	E	W	
INT 01		3			3
INT 02					0
INT 03					0
INT 04	1				1
INT 05	7	2			9
INT 06		1			1
INT 07					0
INT 08		4			4
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	8	10	0	0	18

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Special Notes

TSI19016TM_09a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

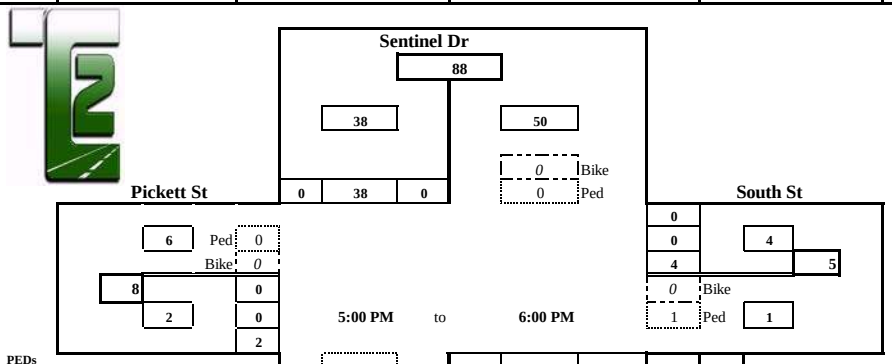
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Sentinel Dr & South St/Pickett St **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) Sentinel Dr				From South on (NB) Sentinel Dr				From East on (WB) South St				From West on (EB) Pickett St				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	19	0	0	1	4	1	0	1	0	0	0	0	0	1	27
4:30 P	0	0	16	0	0	1	1	1	0	3	0	0	0	0	0	0	22
4:45 P	0	0	19	0	2	0	7	0	0	3	0	0	0	0	0	1	30
5:00 P	2	0	3	0	0	1	2	1	0	3	0	0	0	0	0	1	11
5:15 P	0	0	8	0	0	0	5	1	0	4	0	0	0	0	0	0	18
5:30 P	0	0	10	0	0	2	13	0	0	0	0	0	0	0	0	1	26
5:45 P	0	0	6	0	0	3	14	0	0	0	0	0	0	0	0	0	23
6:00 P	0	0	14	0	0	1	18	0	0	0	0	0	0	0	0	1	34
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	0	95	0	2	9	64	4	0	14	0	0	0	0	0	5	191
	Peak Hour: 5:00 PM to 6:00 PM																
Total	0	0	38	0	0	6	50	1	0	4	0	0	0	0	0	2	101
Approach			38				57				4				2		101
%HV			n/a				n/a				n/a				n/a		0.0%
PHF			0.68				0.75				0.25				0.50		0.74



PEDs Across:	N	S	E	W	
INT 01		1			1
INT 02	2		3		5
INT 03			1	2	3
INT 04	1	1		1	3
INT 05			1		1
INT 06		2			2
INT 07		2			2
INT 08		1			1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	3	7	5	3	18

Bicycles From:	N	S	E	W	
INT 01					0
INT 02			1		1
INT 03					0
INT 04		2			2
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	2	1	0	3

136 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.50	n/a
Check	WB	0.25	n/a
In: 101	NB	0.75	n/a
Out: 101	SB	0.68	n/a
	T Int.	0.74	0.0%

Conditions:

Special Notes

TSI19016TM_09p

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

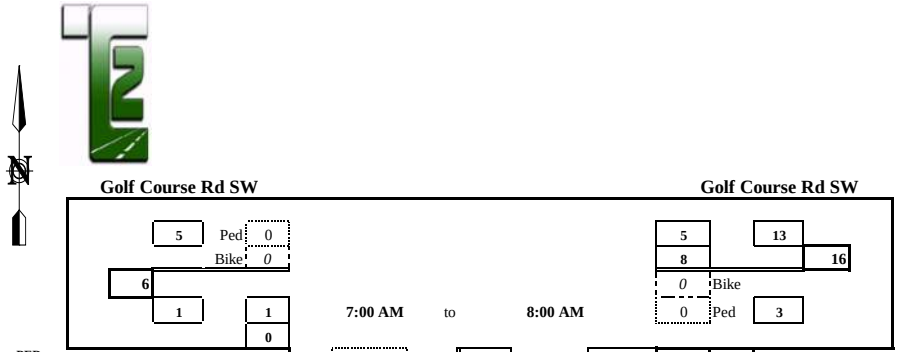
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Kids First Pl & Golf Course Rd SW **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) 0				From South on (NB) Kids First Pl				From East on (WB) Golf Course Rd SW				From West on (EB) Golf Course Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	0	0	0	0	0	0	2	0	3	2	0	0	0	0	0	7
7:30 A	0	0	0	0	0	0	0	0	0	2	1	0	0	0	1	0	4
7:45 A	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	3
8:00 A	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
8:15 A	0	0	0	0	0	0	0	1	0	2	1	0	0	0	1	0	5
8:30 A	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
8:45 A	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	3
9:00 A	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	0	0	0	4	0	15	8	0	0	0	2	0	29
	Peak Hour: 7:00 AM to 8:00 AM																
Total	0	0	0	0	0	0	0	2	0	8	5	0	0	0	1	0	16
Approach	0				2				13				1				16
%HV	n/a				n/a				n/a				n/a				0.0%
PHF	n/a				0.25				0.65				0.25				0.57



PEDs Across:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06				1	1
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	1	1

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

28 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.25	n/a
Check	WB	0.65	n/a
In: 16	NB	0.25	n/a
Out: 16	SB	n/a	n/a
	T Int.	0.57	0.0%

Conditions:

Special Notes

TSI19016TM_10a

Prepared for: **Transportation Solutions, Inc.**

Traffic Count Consultants, Inc.

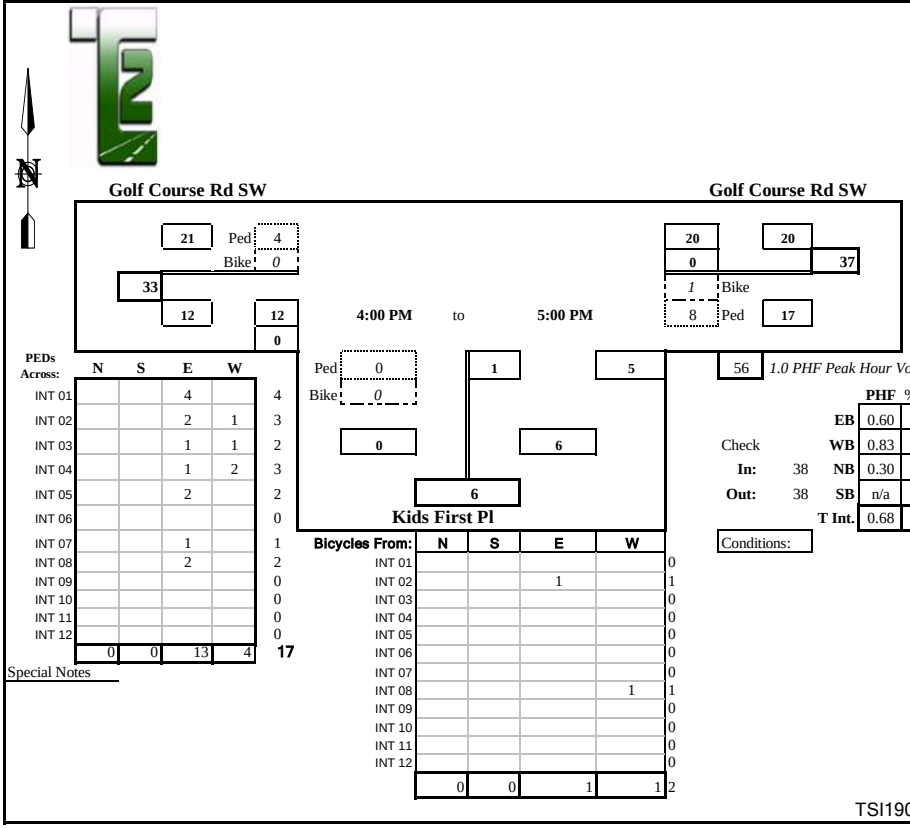
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Kids First Pl & Golf Course Rd SW **Date of Count:** Thurs 6/20/2019

Location: Lakewood, Washington **Checked By:** Jess

Time Interval	From North on (SB) 0				From South on (NB) Kids First Pl				From East on (WB) Golf Course Rd SW				From West on (EB) Golf Course Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	0	1	0	4	0	0	6	0	0	0	3	0	14
4:30 P	0	0	0	0	0	0	0	1	0	0	6	0	0	0	2	0	9
4:45 P	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	5
5:00 P	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	10
5:15 P	0	0	0	0	0	0	0	2	0	0	8	0	0	0	2	0	12
5:30 P	0	0	0	0	0	0	0	1	0	0	5	0	0	0	2	0	8
5:45 P	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
6:00 P	0	0	0	0	0	0	0	0	0	0	2	0	1	0	10	0	12
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	0	1	0	8	0	0	37	0	1	0	27	0	73
	Peak Hour: 4:00 PM to 5:00 PM																
Total	0	0	0	0	0	1	0	5	0	0	20	0	0	0	12	0	38
Approach	0				6				20				12				38
%HV	n/a				n/a				n/a				n/a				0.0%
PHF	n/a				0.30				0.83				0.60				0.68



PEDs Across:

	N	S	E	W	
INT 01			4		4
INT 02			2	1	3
INT 03			1	1	2
INT 04			1	2	3
INT 05			2		2
INT 06					0
INT 07			1		1
INT 08			2		2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	13	4	17

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02			1		1
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08				1	1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	1	1	2

56 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.60	n/a
Check	WB	0.83	n/a
In: 38	NB	0.30	n/a
Out: 38	SB	n/a	n/a
	T Int.	0.68	0.0%

Conditions:

Special Notes

TSI19016TM_10p

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	0	257	61	0	157
Future Vol, veh/h	7	0	257	61	0	157
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	33	0	2	2	0	0
Mvmt Flow	13	0	476	113	0	291

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	874	583	0	0	639	0
Stage 1	583	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.73	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	283	516	-	-	955	-
Stage 1	502	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	269	491	-	-	910	-
Mov Cap-2 Maneuver	269	-	-	-	-	-
Stage 1	478	-	-	-	-	-
Stage 2	693	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	269	910	-
HCM Lane V/C Ratio	-	-	0.048	-	-
HCM Control Delay (s)	-	-	19.1	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	6	7	0	0	2	321	24	0	158	0
Future Vol, veh/h	0	0	6	7	0	0	2	321	24	0	158	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	50	50	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	54	92	54	92	54	54	54	54	92
Heavy Vehicles, %	2	2	2	0	2	0	2	2	0	0	33	2
Mvmt Flow	0	0	7	13	0	0	2	594	44	0	293	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	913	985	293	967	963	666	293	0	0	688	0	0
Stage 1	293	293	-	670	670	-	-	-	-	-	-	-
Stage 2	620	692	-	297	293	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	254	248	746	236	256	463	1269	-	-	916	-	-
Stage 1	715	670	-	450	455	-	-	-	-	-	-	-
Stage 2	476	445	-	716	670	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	253	236	746	223	243	441	1269	-	-	872	-	-
Mov Cap-2 Maneuver	253	236	-	223	243	-	-	-	-	-	-	-
Stage 1	714	670	-	428	432	-	-	-	-	-	-	-
Stage 2	475	423	-	710	670	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	22.1	0	0
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1269	-	-	746	223	872	-	-
HCM Lane V/C Ratio	0.002	-	-	0.009	0.058	-	-	-
HCM Control Delay (s)	7.8	0	-	9.9	22.1	0	-	-
HCM Lane LOS	A	A	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	198	335	57	382	203	78	29	69	286	48	44	72
Future Volume (veh/h)	198	335	57	382	203	78	29	69	286	48	44	72
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1863	1863	1900	1863	1863	1863	1743	1743	1900
Adj Flow Rate, veh/h	233	394	67	449	239	92	34	81	336	56	52	85
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	9	9	9
Cap, veh/h	570	900	152	583	960	359	344	361	599	216	76	125
Arrive On Green	0.11	0.30	0.30	0.19	0.38	0.38	0.19	0.19	0.19	0.13	0.13	0.13
Sat Flow, veh/h	1757	2992	504	1774	2521	944	1774	1863	1541	1660	586	958
Grp Volume(v), veh/h	233	229	232	449	166	165	34	81	336	56	0	137
Grp Sat Flow(s),veh/h/ln	1757	1752	1744	1774	1770	1695	1774	1863	1541	1660	0	1545
Q Serve(g_s), s	9.7	11.3	11.5	17.9	6.9	7.2	1.7	3.9	18.5	3.3	0.0	9.1
Cycle Q Clear(g_c), s	9.7	11.3	11.5	17.9	6.9	7.2	1.7	3.9	18.5	3.3	0.0	9.1
Prop In Lane	1.00		0.29	1.00		0.56	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	570	527	524	583	674	645	344	361	599	216	0	201
V/C Ratio(X)	0.41	0.44	0.44	0.77	0.25	0.26	0.10	0.22	0.56	0.26	0.00	0.68
Avail Cap(c_a), veh/h	622	527	524	724	674	645	362	381	615	416	0	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.6	30.3	30.4	19.0	22.8	22.9	35.7	36.6	26.2	42.2	0.0	44.7
Incr Delay (d2), s/veh	0.2	2.6	2.7	3.0	0.9	1.0	0.0	0.1	0.6	0.2	0.0	1.5
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(95%),veh/ln	8.2	9.8	9.9	14.0	6.3	6.3	1.5	3.7	12.6	2.7	0.0	7.1
LnGrp Delay(d),s/veh	21.8	32.9	33.1	22.1	23.6	23.8	35.7	36.7	26.8	42.4	0.0	46.2
LnGrp LOS	C	C	C	C	C	C	D	D	C	D		D
Approach Vol, veh/h		694			780			451			193	
Approach Delay, s/veh		29.2			22.8			29.2			45.1	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		25.9	25.4	37.4		19.0	16.8	46.0
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		22.0	29.0	27.0		27.0	15.0	41.0
Max Q Clear Time (g_c+I1), s		20.5	19.9	13.5		11.1	11.7	9.2
Green Ext Time (p_c), s		0.2	0.5	2.6		0.5	0.1	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.3
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	640	651	88	4	12
Future Vol, veh/h	29	640	651	88	4	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	8	8
Mvmt Flow	31	681	693	94	4	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	787	0	-	0	1143	394
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	403	-
Critical Hdwy	4.14	-	-	-	6.96	7.06
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	2.22	-	-	-	3.58	3.38
Pot Cap-1 Maneuver	828	-	-	-	185	588
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	626	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	828	-	-	-	174	588
Mov Cap-2 Maneuver	-	-	-	-	174	-
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	626	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	828	-	-	-	369
HCM Lane V/C Ratio	0.037	-	-	-	0.046
HCM Control Delay (s)	9.5	0.3	-	-	15.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	607	717	87	111	23
Future Volume (veh/h)	37	607	717	87	111	23
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	41	674	797	97	123	26
Adj No. of Lanes	0	2	2	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	175	1715	1682	205	244	52
Arrive On Green	0.53	0.53	0.53	0.53	0.17	0.17
Sat Flow, veh/h	77	3325	3271	387	1454	307
Grp Volume(v), veh/h	372	343	444	450	150	0
Grp Sat Flow(s),veh/h/ln	1707	1610	1770	1795	1773	0
Q Serve(g_s), s	0.0	3.8	4.7	4.7	2.3	0.0
Cycle Q Clear(g_c), s	3.5	3.8	4.7	4.7	2.3	0.0
Prop In Lane	0.11			0.22	0.82	0.17
Lane Grp Cap(c), veh/h	1038	852	937	950	298	0
V/C Ratio(X)	0.36	0.40	0.47	0.47	0.50	0.00
Avail Cap(c_a), veh/h	1385	1218	1339	1358	1163	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.1	4.2	4.4	4.4	11.2	0.0
Incr Delay (d2), s/veh	0.2	0.3	0.4	0.4	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.3	3.0	4.2	4.2	2.1	0.0
LnGrp Delay(d),s/veh	4.3	4.5	4.8	4.8	12.6	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		715	894		150	
Approach Delay, s/veh		4.4	4.8		12.6	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.2		9.5		20.2
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				22.5		19.5		22.5
Max Q Clear Time (g_c+I1), s				5.8		4.3		6.7
Green Ext Time (p_c), s				9.4		0.3		9.1

Intersection Summary	
HCM 2010 Ctrl Delay	5.3
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	714	801	114	52	4
Future Vol, veh/h	4	714	801	114	52	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	5	821	921	131	60	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1052	0	-	0	1408	526
Stage 1	-	-	-	-	987	-
Stage 2	-	-	-	-	421	-
Critical Hdwy	4.14	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.22	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	657	-	-	-	132	502
Stage 1	-	-	-	-	326	-
Stage 2	-	-	-	-	636	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	657	-	-	-	130	502
Mov Cap-2 Maneuver	-	-	-	-	130	-
Stage 1	-	-	-	-	321	-
Stage 2	-	-	-	-	636	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	52.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	657	-	-	-	137
HCM Lane V/C Ratio	0.007	-	-	-	0.47
HCM Control Delay (s)	10.5	0.1	-	-	52.7
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	661	23	15	745	54	25	22	27	207	54	146
Future Volume (veh/h)	83	661	23	15	745	54	25	22	27	207	54	146
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	90	718	25	16	810	0	27	24	29	225	59	159
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	115	1694	59	35	1557	0	201	213	186	386	307	269
Arrive On Green	0.06	0.49	0.49	0.02	0.44	0.00	0.03	0.12	0.12	0.08	0.17	0.17
Sat Flow, veh/h	1774	3489	121	1774	3632	0	1792	1787	1563	1792	1787	1565
Grp Volume(v), veh/h	90	364	379	16	810	0	27	24	29	225	59	159
Grp Sat Flow(s),veh/h/ln	1774	1770	1841	1774	1770	0	1792	1787	1563	1792	1787	1565
Q Serve(g_s), s	3.1	8.2	8.2	0.5	10.2	0.0	0.0	0.7	1.0	0.0	1.7	5.7
Cycle Q Clear(g_c), s	3.1	8.2	8.2	0.5	10.2	0.0	0.0	0.7	1.0	0.0	1.7	5.7
Prop In Lane	1.00		0.07	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	115	859	894	35	1557	0	201	213	186	386	307	269
V/C Ratio(X)	0.78	0.42	0.42	0.46	0.52	0.00	0.13	0.11	0.16	0.58	0.19	0.59
Avail Cap(c_a), veh/h	188	859	894	145	1557	0	293	827	723	387	830	727
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	10.2	10.2	29.8	12.5	0.0	28.0	24.1	24.3	24.3	21.8	23.4
Incr Delay (d2), s/veh	4.3	1.5	1.5	3.6	1.2	0.0	0.1	0.1	0.1	1.5	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.9	7.7	7.9	0.5	9.0	0.0	0.8	0.7	0.8	6.6	1.6	4.6
LnGrp Delay(d),s/veh	32.6	11.8	11.7	33.3	13.7	0.0	28.1	24.2	24.4	25.8	21.9	24.2
LnGrp LOS	C	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		833			826			80			443	
Approach Delay, s/veh		14.0			14.1			25.6			24.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	11.8	5.7	34.3	6.3	15.0	8.5	31.5
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	5.1	28.4	5.0	28.5	5.0	28.5	6.5	27.0
Max Q Clear Time (g_c+I1), s	2.0	3.0	2.5	10.2	2.0	7.7	5.1	12.2
Green Ext Time (p_c), s	0.1	0.1	0.0	6.7	0.1	0.8	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	16.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	159	414	0
Future Vol, veh/h	0	2	2	159	414	0
Conflicting Peds, #/hr	0	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	4	1	0
Mvmt Flow	0	2	2	169	440	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	619	447	446	0	-	0
Stage 1	446	-	-	-	-	-
Stage 2	173	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	455	616	1125	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	449	612	1119	-	-	-
Mov Cap-2 Maneuver	530	-	-	-	-	-
Stage 1	644	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1119	-	612	-	-
HCM Lane V/C Ratio	0.002	-	0.003	-	-
HCM Control Delay (s)	8.2	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	9	117	379	4
Future Vol, veh/h	0	4	9	117	379	4
Conflicting Peds, #/hr	0	1	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	10	133	431	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	592	440	441	0	-	0
Stage 1	439	-	-	-	-	-
Stage 2	153	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	469	617	1119	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	460	613	1114	-	-	-
Mov Cap-2 Maneuver	534	-	-	-	-	-
Stage 1	640	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1114	-	613	-	-
HCM Lane V/C Ratio	0.009	-	0.007	-	-
HCM Control Delay (s)	8.3	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	0	7	4	0	1
Future Vol, veh/h	1	0	7	4	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	17	0	0	0	0	2
Mvmt Flow	2	0	13	7	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2	0	35	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	33	-
Critical Hdwy	-	-	4.1	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1634	-	983	1082
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	995	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1634	-	975	1082
Mov Cap-2 Maneuver	-	-	-	-	975	-
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	987	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.6	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1082	-	-	1634	-
HCM Lane V/C Ratio	0.002	-	-	0.008	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	0	110	2	0	126
Future Vol, veh/h	16	0	110	2	0	126
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	25	0	175	3	0	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	397	197	0	0	198	0
Stage 1	197	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	612	849	-	-	1387	-
Stage 1	841	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	600	833	-	-	1361	-
Mov Cap-2 Maneuver	600	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	600	1361	-
HCM Lane V/C Ratio	-	-	0.042	-	-
HCM Control Delay (s)	-	-	11.3	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	0	112	1	0	142
Future Vol, veh/h	4	0	112	1	0	142
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	151	1	0	192

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	364	172	0	0	172	0
Stage 1	172	-	-	-	-	-
Stage 2	192	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	639	877	-	-	1417	-
Stage 1	863	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	627	860	-	-	1390	-
Mov Cap-2 Maneuver	627	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	845	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	627	1390	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	-	-	10.8	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	413	38	313	507	37	69	18	287	66	25	57
Future Volume (veh/h)	64	413	38	313	507	37	69	18	287	66	25	57
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	69	444	41	337	545	40	74	19	309	71	27	61
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	329	805	74	453	1203	88	629	660	796	139	39	89
Arrive On Green	0.04	0.24	0.24	0.15	0.36	0.36	0.35	0.35	0.35	0.08	0.08	0.08
Sat Flow, veh/h	1792	3304	304	1792	3375	247	1792	1881	1568	1792	506	1143
Grp Volume(v), veh/h	69	239	246	337	288	297	74	19	309	71	0	88
Grp Sat Flow(s),veh/h/ln	1792	1787	1821	1792	1787	1836	1792	1881	1568	1792	0	1649
Q Serve(g_s), s	3.3	13.4	13.6	15.6	14.2	14.3	3.2	0.8	14.0	4.4	0.0	6.0
Cycle Q Clear(g_c), s	3.3	13.4	13.6	15.6	14.2	14.3	3.2	0.8	14.0	4.4	0.0	6.0
Prop In Lane	1.00		0.17	1.00		0.13	1.00		1.00	1.00		0.69
Lane Grp Cap(c), veh/h	329	436	444	453	637	654	629	660	796	139	0	128
V/C Ratio(X)	0.21	0.55	0.55	0.74	0.45	0.45	0.12	0.03	0.39	0.51	0.00	0.69
Avail Cap(c_a), veh/h	334	436	444	474	637	654	629	660	796	421	0	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.6	38.0	38.0	25.9	28.4	28.4	25.3	24.5	17.6	50.9	0.0	51.7
Incr Delay (d2), s/veh	0.1	4.9	4.9	5.2	2.3	2.3	0.4	0.1	1.4	1.1	0.0	2.5
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(95%),veh/ln	2.9	11.7	11.9	12.9	11.9	12.2	3.0	0.7	10.4	4.0	0.0	5.1
LnGrp Delay(d),s/veh	30.7	42.9	42.9	31.1	30.7	30.7	25.6	24.5	19.0	52.0	0.0	54.1
LnGrp LOS	C	D	D	C	C	C	C	C	B	D		D
Approach Vol, veh/h		554			922			402			159	
Approach Delay, s/veh		41.4			30.8			20.5			53.2	
Approach LOS		D			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		45.4	22.7	33.0		13.9	9.7	46.0
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		22.0	19.0	27.0		27.0	5.0	41.0
Max Q Clear Time (g_c+I1), s		16.0	17.6	15.6		8.0	5.3	16.3
Green Ext Time (p_c), s		0.4	0.1	3.3		0.4	0.0	4.2

Intersection Summary	
HCM 2010 Ctrl Delay	33.4
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	770	852	7	48	22
Future Vol, veh/h	2	770	852	7	48	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	2	802	888	7	50	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	895	0	-	0	1297	448
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	760	-	-	-	156	564
Stage 1	-	-	-	-	366	-
Stage 2	-	-	-	-	648	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	760	-	-	-	155	564
Mov Cap-2 Maneuver	-	-	-	-	155	-
Stage 1	-	-	-	-	364	-
Stage 2	-	-	-	-	648	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	32.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	760	-	-	-	201
HCM Lane V/C Ratio	0.003	-	-	-	0.363
HCM Control Delay (s)	9.8	0	-	-	32.8
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	816	807	11	111	46
Future Volume (veh/h)	7	816	807	11	111	46
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	7	859	849	12	117	48
Adj No. of Lanes	0	2	2	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	66	1365	1412	20	557	228
Arrive On Green	0.39	0.39	0.39	0.39	0.45	0.45
Sat Flow, veh/h	7	3572	3702	51	1228	504
Grp Volume(v), veh/h	463	403	420	441	166	0
Grp Sat Flow(s),veh/h/ln	1868	1626	1787	1872	1742	0
Q Serve(g_s), s	0.0	11.6	10.9	10.9	3.3	0.0
Cycle Q Clear(g_c), s	11.5	11.6	10.9	10.9	3.3	0.0
Prop In Lane	0.02			0.03	0.70	0.29
Lane Grp Cap(c), veh/h	794	637	699	733	790	0
V/C Ratio(X)	0.58	0.63	0.60	0.60	0.21	0.00
Avail Cap(c_a), veh/h	977	799	878	920	790	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.3	14.3	14.0	14.0	9.6	0.0
Incr Delay (d2), s/veh	0.7	1.1	0.8	0.8	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.1	9.1	9.2	9.6	3.1	0.0
LnGrp Delay(d),s/veh	14.9	15.4	14.9	14.8	10.2	0.0
LnGrp LOS	B	B	B	B	B	
Approach Vol, veh/h		866	861		166	
Approach Delay, s/veh		15.1	14.9		10.2	
Approach LOS		B	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				27.2		30.8		27.2
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				28.5		20.5		28.5
Max Q Clear Time (g_c+I1), s				13.6		5.3		12.9
Green Ext Time (p_c), s				9.1		0.4		9.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	902	804	11	46	4
Future Vol, veh/h	0	902	804	11	46	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	960	855	12	49	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	867	0	-	0	1341	434
Stage 1	-	-	-	-	861	-
Stage 2	-	-	-	-	480	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	779	-	-	-	146	576
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	594	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	779	-	-	-	146	576
Mov Cap-2 Maneuver	-	-	-	-	146	-
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	594	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	39.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	779	-	-	-	155
HCM Lane V/C Ratio	-	-	-	-	0.343
HCM Control Delay (s)	0	-	-	-	39.9
HCM Lane LOS	A	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	758	50	64	657	212	26	88	66	168	57	118
Future Volume (veh/h)	130	758	50	64	657	212	26	88	66	168	57	118
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.96	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	135	790	52	67	684	0	27	92	69	175	59	123
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	171	1548	102	96	1476	0	305	280	188	362	333	290
Arrive On Green	0.10	0.45	0.45	0.05	0.41	0.00	0.03	0.14	0.14	0.08	0.19	0.19
Sat Flow, veh/h	1792	3404	224	1792	3668	0	1810	2027	1364	1792	1787	1557
Grp Volume(v), veh/h	135	415	427	67	684	0	27	81	80	175	59	123
Grp Sat Flow(s),veh/h/ln	1792	1787	1841	1792	1787	0	1810	1805	1586	1792	1787	1557
Q Serve(g_s), s	4.8	10.8	10.8	2.4	9.1	0.0	0.8	2.6	3.0	5.1	1.8	4.6
Cycle Q Clear(g_c), s	4.8	10.8	10.8	2.4	9.1	0.0	0.8	2.6	3.0	5.1	1.8	4.6
Prop In Lane	1.00		0.12	1.00		0.00	1.00		0.86	1.00		1.00
Lane Grp Cap(c), veh/h	171	813	837	96	1476	0	305	249	219	362	333	290
V/C Ratio(X)	0.79	0.51	0.51	0.69	0.46	0.00	0.09	0.32	0.37	0.48	0.18	0.42
Avail Cap(c_a), veh/h	211	813	837	178	1476	0	390	751	660	362	746	650
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	12.7	12.7	30.4	13.9	0.0	23.0	25.4	25.6	22.0	22.4	23.5
Incr Delay (d2), s/veh	11.8	2.3	2.2	3.3	1.0	0.0	0.0	0.3	0.4	0.4	0.1	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(95%),veh/ln	5.3	9.8	10.0	2.3	8.2	0.0	0.7	2.4	2.4	0.7	1.6	3.6
LnGrp Delay(d),s/veh	40.7	14.9	14.9	33.7	15.0	0.0	23.0	25.7	26.0	22.4	22.5	23.9
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		977			751			188			357	
Approach Delay, s/veh		18.5			16.6			25.4			22.9	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	13.5	8.0	34.2	6.4	16.7	10.7	31.5
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	5.1	27.2	6.5	28.2	5.0	27.3	7.7	27.0
Max Q Clear Time (g_c+I1), s	7.1	5.0	4.4	12.8	2.8	6.6	6.8	11.1
Green Ext Time (p_c), s	0.0	1.4	0.0	6.0	0.0	1.3	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	19.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	490	280	0
Future Vol, veh/h	0	4	1	490	280	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	4	1	533	304	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	842	307	307	0	-	0
Stage 1	307	-	-	-	-	-
Stage 2	535	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	337	738	1265	-	-	-
Stage 1	751	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	335	736	1261	-	-	-
Mov Cap-2 Maneuver	449	-	-	-	-	-
Stage 1	748	-	-	-	-	-
Stage 2	589	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1261	-	736	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	7.9	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	11	32	360	292	2
Future Vol, veh/h	3	11	32	360	292	2
Conflicting Peds, #/hr	0	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	3	12	34	383	311	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	765	315	315	0	-	0
Stage 1	314	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	374	730	1257	-	-	-
Stage 1	745	-	-	-	-	-
Stage 2	646	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	360	728	1255	-	-	-
Mov Cap-2 Maneuver	473	-	-	-	-	-
Stage 1	718	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1255	-	653	-	-
HCM Lane V/C Ratio	0.027	-	0.023	-	-
HCM Control Delay (s)	7.9	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	0	0	19	1	5
Future Vol, veh/h	4	0	0	19	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	0	0	28	1	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	6	0	34	6
Stage 1	-	-	-	-	6	-
Stage 2	-	-	-	-	28	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1628	-	984	1083
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1000	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1628	-	984	1083
Mov Cap-2 Maneuver	-	-	-	-	984	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1000	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1065	-	-	1628	-
HCM Lane V/C Ratio	0.008	-	-	-	-
HCM Control Delay (s)	8.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	0	257	61	0	157
Future Vol, veh/h	7	0	257	61	0	157
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	33	0	2	2	0	0
Mvmt Flow	13	0	476	113	0	291

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	874	583	0	0	639	0
Stage 1	583	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.73	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	283	516	-	-	955	-
Stage 1	502	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	269	491	-	-	910	-
Mov Cap-2 Maneuver	269	-	-	-	-	-
Stage 1	478	-	-	-	-	-
Stage 2	693	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	269	910	-
HCM Lane V/C Ratio	-	-	0.048	-	-
HCM Control Delay (s)	-	-	19.1	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	0	321	24	0	158
Future Vol, veh/h	7	0	321	24	0	158
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	0	0	2	0	0	33
Mvmt Flow	13	0	594	44	0	293

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	959	666	0	0	688	0
Stage 1	666	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	288	463	-	-	916	-
Stage 1	515	-	-	-	-	-
Stage 2	762	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	274	441	-	-	872	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	490	-	-	-	-	-
Stage 2	762	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	274	872	-
HCM Lane V/C Ratio	-	-	0.047	-	-
HCM Control Delay (s)	-	-	18.8	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	198	413	70	471	250	78	36	69	352	48	45	72
Future Volume (veh/h)	198	413	70	471	250	78	36	69	352	48	45	72
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1863	1863	1900	1863	1863	1863	1743	1743	1900
Adj Flow Rate, veh/h	233	486	82	554	294	92	42	81	414	56	53	85
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	9	9	9
Cap, veh/h	511	733	123	581	995	305	354	372	695	215	77	123
Arrive On Green	0.12	0.24	0.24	0.24	0.37	0.37	0.20	0.20	0.20	0.13	0.13	0.13
Sat Flow, veh/h	1757	2994	502	1774	2668	819	1774	1863	1542	1660	594	952
Grp Volume(v), veh/h	233	283	285	554	193	193	42	81	414	56	0	138
Grp Sat Flow(s),veh/h/ln	1757	1752	1744	1774	1770	1717	1774	1863	1542	1660	0	1546
Q Serve(g_s), s	10.8	16.1	16.2	24.7	8.5	8.7	2.1	4.0	22.0	3.3	0.0	9.4
Cycle Q Clear(g_c), s	10.8	16.1	16.2	24.7	8.5	8.7	2.1	4.0	22.0	3.3	0.0	9.4
Prop In Lane	1.00		0.29	1.00		0.48	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	511	429	427	581	660	640	354	372	695	215	0	200
V/C Ratio(X)	0.46	0.66	0.67	0.95	0.29	0.30	0.12	0.22	0.60	0.26	0.00	0.69
Avail Cap(c_a), veh/h	545	429	427	614	660	640	354	372	695	407	0	379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.9	37.5	37.6	22.5	24.3	24.4	36.2	36.9	23.3	43.2	0.0	45.8
Incr Delay (d2), s/veh	0.2	7.8	8.0	24.2	1.1	1.2	0.1	0.1	1.0	0.2	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.0	13.6	13.6	22.3	7.8	7.8	1.9	3.7	14.9	2.8	0.0	7.4
LnGrp Delay(d),s/veh	26.2	45.2	45.6	46.7	25.5	25.6	36.2	37.0	24.3	43.4	0.0	47.4
LnGrp LOS	C	D	D	D	C	C	D	D	C	D		D
Approach Vol, veh/h		801			940			537			194	
Approach Delay, s/veh		39.8			38.0			27.1			46.3	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		27.0	32.0	32.0		19.3	17.8	46.1
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		22.0	29.0	27.0		27.0	15.0	41.0
Max Q Clear Time (g_c+I1), s		24.0	26.7	18.2		11.4	12.8	10.7
Green Ext Time (p_c), s		0.0	0.3	2.6		0.5	0.1	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	36.9
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	784	787	88	4	12
Future Vol, veh/h	29	784	787	88	4	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	8	8
Mvmt Flow	31	834	837	94	4	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	931	0	-	0	1363	466
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	479	-
Critical Hdwy	4.14	-	-	-	6.96	7.06
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	2.22	-	-	-	3.58	3.38
Pot Cap-1 Maneuver	731	-	-	-	132	527
Stage 1	-	-	-	-	350	-
Stage 2	-	-	-	-	572	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	731	-	-	-	122	527
Mov Cap-2 Maneuver	-	-	-	-	122	-
Stage 1	-	-	-	-	322	-
Stage 2	-	-	-	-	572	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	18.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	731	-	-	-	288
HCM Lane V/C Ratio	0.042	-	-	-	0.059
HCM Control Delay (s)	10.1	0.4	-	-	18.3
HCM Lane LOS	B	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	751	853	87	111	23
Future Volume (veh/h)	37	751	853	87	111	23
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	41	834	948	97	123	26
Adj No. of Lanes	0	2	2	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	158	1827	1821	186	228	48
Arrive On Green	0.56	0.56	0.56	0.56	0.16	0.16
Sat Flow, veh/h	63	3339	3335	332	1454	307
Grp Volume(v), veh/h	453	422	517	528	150	0
Grp Sat Flow(s),veh/h/ln	1707	1610	1770	1804	1773	0
Q Serve(g_s), s	0.0	5.0	5.8	5.8	2.5	0.0
Cycle Q Clear(g_c), s	4.5	5.0	5.8	5.8	2.5	0.0
Prop In Lane	0.09			0.18	0.82	0.17
Lane Grp Cap(c), veh/h	1081	904	994	1013	278	0
V/C Ratio(X)	0.42	0.47	0.52	0.52	0.54	0.00
Avail Cap(c_a), veh/h	1299	1135	1247	1271	1083	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.1	4.2	4.3	4.3	12.4	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.4	0.4	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.2	4.0	5.1	5.2	2.4	0.0
LnGrp Delay(d),s/veh	4.3	4.5	4.8	4.8	14.0	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		875	1045		150	
Approach Delay, s/veh		4.4	4.8		14.0	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				22.4		9.5		22.4
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				22.5		19.5		22.5
Max Q Clear Time (g_c+I1), s				7.0		4.5		7.8
Green Ext Time (p_c), s				10.6		0.3		10.1

Intersection Summary	
HCM 2010 Ctrl Delay	5.3
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	858	937	114	52	4
Future Vol, veh/h	4	858	937	114	52	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	5	986	1077	131	60	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1208	0	-	0	1646	604
Stage 1	-	-	-	-	1143	-
Stage 2	-	-	-	-	503	-
Critical Hdwy	4.14	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.22	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	573	-	-	-	92	446
Stage 1	-	-	-	-	270	-
Stage 2	-	-	-	-	578	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	573	-	-	-	90	446
Mov Cap-2 Maneuver	-	-	-	-	90	-
Stage 1	-	-	-	-	265	-
Stage 2	-	-	-	-	578	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	100
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	573	-	-	-	95
HCM Lane V/C Ratio	0.008	-	-	-	0.678
HCM Control Delay (s)	11.3	0.1	-	-	100
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	785	27	18	856	67	29	27	33	255	67	168
Future Volume (veh/h)	99	785	27	18	856	67	29	27	33	255	67	168
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	108	853	29	20	930	0	32	29	36	277	73	183
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	138	1669	57	41	1499	0	179	208	182	379	330	289
Arrive On Green	0.08	0.48	0.48	0.02	0.42	0.00	0.03	0.12	0.12	0.10	0.18	0.18
Sat Flow, veh/h	1774	3492	119	1774	3632	0	1792	1787	1562	1792	1787	1566
Grp Volume(v), veh/h	108	432	450	20	930	0	32	29	36	277	73	183
Grp Sat Flow(s),veh/h/ln	1774	1770	1841	1774	1770	0	1792	1787	1562	1792	1787	1566
Q Serve(g_s), s	3.8	10.8	10.8	0.7	13.1	0.0	0.0	0.9	1.3	2.0	2.2	6.9
Cycle Q Clear(g_c), s	3.8	10.8	10.8	0.7	13.1	0.0	0.0	0.9	1.3	2.0	2.2	6.9
Prop In Lane	1.00		0.06	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	138	846	880	41	1499	0	179	208	182	379	330	289
V/C Ratio(X)	0.78	0.51	0.51	0.48	0.62	0.00	0.18	0.14	0.20	0.73	0.22	0.63
Avail Cap(c_a), veh/h	181	846	880	139	1499	0	263	796	696	379	799	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	11.5	11.5	30.7	14.4	0.0	29.8	25.3	25.5	25.3	22.1	24.0
Incr Delay (d2), s/veh	10.9	2.2	2.1	3.2	1.9	0.0	0.2	0.1	0.2	6.2	0.1	0.9
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(95%),veh/ln	4.1	9.6	9.9	0.7	11.0	0.0	1.0	0.8	1.0	8.9	2.0	5.4
LnGrp Delay(d),s/veh	39.8	13.7	13.6	33.9	16.3	0.0	30.0	25.4	25.7	31.5	22.2	24.9
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		990			950			97			533	
Approach Delay, s/veh		16.5			16.7			27.0			28.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	11.9	6.0	35.0	6.5	16.3	9.5	31.5
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	5.1	28.4	5.0	28.5	5.0	28.5	6.5	27.0
Max Q Clear Time (g_c+I1), s	4.0	3.3	2.7	12.8	2.0	8.9	5.8	15.1
Green Ext Time (p_c), s	0.1	0.2	0.0	7.5	0.0	1.0	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	196	510	0
Future Vol, veh/h	0	2	2	196	510	0
Conflicting Peds, #/hr	0	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	4	1	0
Mvmt Flow	0	2	2	209	543	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	762	550	549	0	-	0
Stage 1	549	-	-	-	-	-
Stage 2	213	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	376	539	1031	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	827	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	371	535	1025	-	-	-
Mov Cap-2 Maneuver	468	-	-	-	-	-
Stage 1	578	-	-	-	-	-
Stage 2	822	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1025	-	535	-	-
HCM Lane V/C Ratio	0.002	-	0.004	-	-
HCM Control Delay (s)	8.5	0	11.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	9	144	467	4
Future Vol, veh/h	0	4	9	144	467	4
Conflicting Peds, #/hr	0	1	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	10	164	531	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	723	540	541	0	-	0
Stage 1	539	-	-	-	-	-
Stage 2	184	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	393	542	1028	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	848	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	385	539	1023	-	-	-
Mov Cap-2 Maneuver	475	-	-	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	844	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1023	-	539	-	-
HCM Lane V/C Ratio	0.01	-	0.008	-	-
HCM Control Delay (s)	8.6	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	0	7	5	0	1
Future Vol, veh/h	4	0	7	5	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	17	0	0	0	0	2
Mvmt Flow	7	0	13	9	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	7	0	42	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	35	-
Critical Hdwy	-	-	4.1	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1627	-	974	1075
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	993	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1627	-	966	1075
Mov Cap-2 Maneuver	-	-	-	-	966	-
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	985	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.2	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1075	-	-	1627	-
HCM Lane V/C Ratio	0.002	-	-	0.008	-
HCM Control Delay (s)	8.4	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	0	110	2	0	126
Future Vol, veh/h	16	0	110	2	0	126
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	25	0	175	3	0	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	397	197	0	0	198	0
Stage 1	197	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	612	849	-	-	1387	-
Stage 1	841	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	600	833	-	-	1361	-
Mov Cap-2 Maneuver	600	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	600	1361	-
HCM Lane V/C Ratio	-	-	0.042	-	-
HCM Control Delay (s)	-	-	11.3	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	0	112	1	0	142
Future Vol, veh/h	4	0	112	1	0	142
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	151	1	0	192

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	364	172	0	0	172	0
Stage 1	172	-	-	-	-	-
Stage 2	192	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	639	877	-	-	1417	-
Stage 1	863	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	627	860	-	-	1390	-
Mov Cap-2 Maneuver	627	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	845	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	627	1390	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	-	-	10.8	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	509	47	386	625	37	85	19	354	66	25	57
Future Volume (veh/h)	64	509	47	386	625	37	85	19	354	66	25	57
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	69	547	51	415	672	40	91	20	381	71	27	61
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	286	775	72	426	1229	73	624	656	811	139	39	89
Arrive On Green	0.04	0.23	0.23	0.17	0.36	0.36	0.35	0.35	0.35	0.08	0.08	0.08
Sat Flow, veh/h	1792	3300	307	1792	3427	204	1792	1881	1568	1792	506	1143
Grp Volume(v), veh/h	69	296	302	415	350	362	91	20	381	71	0	88
Grp Sat Flow(s),veh/h/ln	1792	1787	1820	1792	1787	1844	1792	1881	1568	1792	0	1649
Q Serve(g_s), s	3.3	17.4	17.5	19.0	18.0	18.0	4.0	0.8	17.9	4.4	0.0	6.0
Cycle Q Clear(g_c), s	3.3	17.4	17.5	19.0	18.0	18.0	4.0	0.8	17.9	4.4	0.0	6.0
Prop In Lane	1.00		0.17	1.00		0.11	1.00		1.00	1.00		0.69
Lane Grp Cap(c), veh/h	286	420	427	426	641	661	624	656	811	139	0	128
V/C Ratio(X)	0.24	0.70	0.71	0.97	0.55	0.55	0.15	0.03	0.47	0.51	0.00	0.69
Avail Cap(c_a), veh/h	290	420	427	426	641	661	624	656	811	421	0	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.4	40.3	40.4	29.3	29.4	29.4	25.7	24.7	18.0	50.9	0.0	51.7
Incr Delay (d2), s/veh	0.2	9.5	9.5	36.3	3.3	3.2	0.5	0.1	2.0	1.1	0.0	2.5
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(95%),veh/ln	3.0	14.8	15.1	12.8	14.5	14.9	3.7	0.8	12.8	4.0	0.0	5.1
LnGrp Delay(d),s/veh	31.6	49.9	49.9	65.6	32.7	32.7	26.2	24.7	19.9	52.0	0.0	54.1
LnGrp LOS	C	D	D	E	C	C	C	C	B	D		D
Approach Vol, veh/h		667			1127			492			159	
Approach Delay, s/veh		48.0			44.8			21.3			53.2	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		45.1	24.0	32.0		13.9	9.7	46.3
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		22.0	19.0	27.0		27.0	5.0	41.0
Max Q Clear Time (g_c+I1), s		19.9	21.0	19.5		8.0	5.3	20.0
Green Ext Time (p_c), s		0.3	0.0	3.2		0.4	0.0	5.2

Intersection Summary	
HCM 2010 Ctrl Delay	41.5
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	933	1043	7	48	22
Future Vol, veh/h	2	933	1043	7	48	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	2	972	1086	7	50	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1093	0	-	0	1580	547
Stage 1	-	-	-	-	1090	-
Stage 2	-	-	-	-	490	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	640	-	-	-	102	486
Stage 1	-	-	-	-	288	-
Stage 2	-	-	-	-	587	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	640	-	-	-	101	486
Mov Cap-2 Maneuver	-	-	-	-	101	-
Stage 1	-	-	-	-	286	-
Stage 2	-	-	-	-	587	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	60.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	640	-	-	-	134
HCM Lane V/C Ratio	0.003	-	-	-	0.544
HCM Control Delay (s)	10.6	0	-	-	60.1
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	979	998	11	111	46
Future Volume (veh/h)	7	979	998	11	111	46
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	7	1031	1051	12	117	48
Adj No. of Lanes	0	2	2	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	65	1523	1581	18	501	206
Arrive On Green	0.44	0.44	0.44	0.44	0.41	0.41
Sat Flow, veh/h	6	3573	3714	41	1228	504
Grp Volume(v), veh/h	555	483	519	544	166	0
Grp Sat Flow(s),veh/h/ln	1867	1626	1787	1874	1742	0
Q Serve(g_s), s	0.0	13.8	13.4	13.4	3.6	0.0
Cycle Q Clear(g_c), s	13.7	13.8	13.4	13.4	3.6	0.0
Prop In Lane	0.01			0.02	0.70	0.29
Lane Grp Cap(c), veh/h	878	710	781	819	711	0
V/C Ratio(X)	0.63	0.68	0.66	0.66	0.23	0.00
Avail Cap(c_a), veh/h	978	799	878	921	711	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.0	13.1	13.0	13.0	11.2	0.0
Incr Delay (d2), s/veh	1.1	2.0	1.6	1.5	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.6	10.8	11.1	11.5	3.3	0.0
LnGrp Delay(d),s/veh	14.2	15.1	14.6	14.5	12.0	0.0
LnGrp LOS	B	B	B	B	B	
Approach Vol, veh/h		1038	1063		166	
Approach Delay, s/veh		14.6	14.5		12.0	
Approach LOS		B	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				29.8		28.2		29.8
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				28.5		20.5		28.5
Max Q Clear Time (g_c+I1), s				15.8		5.6		15.4
Green Ext Time (p_c), s				9.5		0.4		9.8

Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1065	995	11	46	4
Future Vol, veh/h	0	1065	995	11	46	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	1133	1059	12	49	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1071	0	-	0	1632	536
Stage 1	-	-	-	-	1065	-
Stage 2	-	-	-	-	567	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	652	-	-	-	94	494
Stage 1	-	-	-	-	297	-
Stage 2	-	-	-	-	537	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	652	-	-	-	94	494
Mov Cap-2 Maneuver	-	-	-	-	94	-
Stage 1	-	-	-	-	297	-
Stage 2	-	-	-	-	537	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	74.8
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	652	-	-	-	101
HCM Lane V/C Ratio	-	-	-	-	0.527
HCM Control Delay (s)	0	-	-	-	74.8
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	890	59	79	814	261	32	108	81	207	70	146
Future Volume (veh/h)	153	890	59	79	814	261	32	108	81	207	70	146
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.96	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	159	927	61	82	848	0	33	112	84	216	73	152
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	198	1535	101	105	1427	0	288	300	204	352	339	296
Arrive On Green	0.11	0.45	0.45	0.06	0.40	0.00	0.03	0.15	0.15	0.08	0.19	0.19
Sat Flow, veh/h	1792	3404	224	1792	3668	0	1810	2020	1373	1792	1787	1558
Grp Volume(v), veh/h	159	487	501	82	848	0	33	99	97	216	73	152
Grp Sat Flow(s),veh/h/ln	1792	1787	1841	1792	1787	0	1810	1805	1588	1792	1787	1558
Q Serve(g_s), s	5.9	13.9	13.9	3.1	12.6	0.0	1.0	3.3	3.8	5.1	2.3	5.9
Cycle Q Clear(g_c), s	5.9	13.9	13.9	3.1	12.6	0.0	1.0	3.3	3.8	5.1	2.3	5.9
Prop In Lane	1.00		0.12	1.00		0.00	1.00		0.86	1.00		1.00
Lane Grp Cap(c), veh/h	198	806	830	105	1427	0	288	268	236	352	339	296
V/C Ratio(X)	0.80	0.60	0.60	0.78	0.59	0.00	0.11	0.37	0.41	0.61	0.22	0.51
Avail Cap(c_a), veh/h	204	806	830	172	1427	0	360	726	639	352	722	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	14.0	14.0	31.4	16.0	0.0	23.1	25.9	26.1	24.3	23.1	24.6
Incr Delay (d2), s/veh	18.4	3.3	3.2	4.6	1.8	0.0	0.1	0.3	0.4	2.3	0.1	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(95%),veh/ln	7.0	12.0	12.3	2.9	10.8	0.0	0.9	3.0	3.0	2.9	2.1	4.6
LnGrp Delay(d),s/veh	47.7	17.4	17.3	36.0	17.8	0.0	23.1	26.2	26.5	26.6	23.2	25.1
LnGrp LOS	D	B	B	D	B		C	C	C	C	C	C
Approach Vol, veh/h		1147			930			229			441	
Approach Delay, s/veh		21.5			19.4			25.9			25.5	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	14.6	8.5	35.0	6.8	17.3	12.0	31.5
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	5.1	27.2	6.5	28.2	5.0	27.3	7.7	27.0
Max Q Clear Time (g_c+I1), s	7.1	5.8	5.1	15.9	3.0	7.9	7.9	14.6
Green Ext Time (p_c), s	0.0	1.7	0.0	6.6	0.0	1.6	0.0	6.6

Intersection Summary	
HCM 2010 Ctrl Delay	21.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	604	345	0
Future Vol, veh/h	0	4	1	604	345	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	4	1	657	375	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1037	378	378	0	-	0
Stage 1	378	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	258	673	1192	-	-	-
Stage 1	697	-	-	-	-	-
Stage 2	518	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	256	671	1189	-	-	-
Mov Cap-2 Maneuver	383	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	516	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1189	-	671	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	8	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	11	32	444	360	2
Future Vol, veh/h	3	11	32	444	360	2
Conflicting Peds, #/hr	0	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	3	12	34	472	383	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	926	387	387	0	-	0
Stage 1	386	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	301	665	1183	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	288	663	1181	-	-	-
Mov Cap-2 Maneuver	415	-	-	-	-	-
Stage 1	663	-	-	-	-	-
Stage 2	587	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1181	-	588	-	-
HCM Lane V/C Ratio	0.029	-	0.025	-	-
HCM Control Delay (s)	8.1	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	9	0	0	34	1	5
Future Vol, veh/h	9	0	0	34	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	13	0	0	50	1	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	13	0	63	13
Stage 1	-	-	-	-	13	-
Stage 2	-	-	-	-	50	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1619	-	948	1073
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	978	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1619	-	948	1073
Mov Cap-2 Maneuver	-	-	-	-	948	-
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	978	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1050	-	-	1619	-
HCM Lane V/C Ratio	0.008	-	-	-	-
HCM Control Delay (s)	8.5	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	0	257	70	0	157
Future Vol, veh/h	15	0	257	70	0	157
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	33	0	2	2	0	0
Mvmt Flow	28	0	476	130	0	291

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	882	591	0	0	656	0
Stage 1	591	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.73	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	280	511	-	-	941	-
Stage 1	497	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	267	487	-	-	896	-
Mov Cap-2 Maneuver	267	-	-	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	693	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	267	896	-
HCM Lane V/C Ratio	-	-	0.104	-	-
HCM Control Delay (s)	-	-	20	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	330	0	0	166
Future Vol, veh/h	0	0	330	0	0	166
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	0	0	2	0	0	33
Mvmt Flow	0	0	611	0	0	307

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	968	661	0	0	661	0
Stage 1	661	-	-	-	-	-
Stage 2	307	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	284	466	-	-	937	-
Stage 1	517	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	270	444	-	-	892	-
Mov Cap-2 Maneuver	270	-	-	-	-	-
Stage 1	492	-	-	-	-	-
Stage 2	751	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	892	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	401	70	467	250	73	36	67	354	48	46	72
Future Volume (veh/h)	190	401	70	467	250	73	36	67	354	48	46	72
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1863	1863	1900	1863	1863	1863	1743	1743	1900
Adj Flow Rate, veh/h	224	472	82	549	294	86	42	79	416	56	54	85
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	9	9	9
Cap, veh/h	506	731	126	583	1018	293	355	373	692	216	78	123
Arrive On Green	0.11	0.25	0.25	0.24	0.38	0.38	0.20	0.20	0.20	0.13	0.13	0.13
Sat Flow, veh/h	1757	2979	514	1774	2714	780	1774	1863	1542	1660	601	946
Grp Volume(v), veh/h	224	276	278	549	190	190	42	79	416	56	0	139
Grp Sat Flow(s),veh/h/ln	1757	1752	1741	1774	1770	1724	1774	1863	1542	1660	0	1547
Q Serve(g_s), s	10.3	15.5	15.7	24.3	8.3	8.5	2.1	3.9	22.0	3.3	0.0	9.4
Cycle Q Clear(g_c), s	10.3	15.5	15.7	24.3	8.3	8.5	2.1	3.9	22.0	3.3	0.0	9.4
Prop In Lane	1.00		0.30	1.00		0.45	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	506	430	427	583	664	647	355	373	692	216	0	201
V/C Ratio(X)	0.44	0.64	0.65	0.94	0.29	0.29	0.12	0.21	0.60	0.26	0.00	0.69
Avail Cap(c_a), veh/h	548	430	427	620	664	647	355	373	692	408	0	380
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	37.2	37.2	22.4	24.0	24.1	36.0	36.8	23.4	43.1	0.0	45.7
Incr Delay (d2), s/veh	0.2	7.2	7.4	21.7	1.1	1.2	0.1	0.1	1.0	0.2	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.6	13.1	13.2	21.7	7.6	7.7	1.9	3.6	15.0	2.8	0.0	7.5
LnGrp Delay(d),s/veh	26.2	44.4	44.7	44.1	25.1	25.3	36.1	36.9	24.4	43.3	0.0	47.3
LnGrp LOS	C	D	D	D	C	C	D	D	C	D		D
Approach Vol, veh/h		778			929			537			195	
Approach Delay, s/veh		39.3			36.3			27.2			46.1	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		27.0	31.7	32.0		19.3	17.4	46.3
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		22.0	29.0	27.0		27.0	15.0	41.0
Max Q Clear Time (g_c+I1), s		24.0	26.3	17.7		11.4	12.3	10.5
Green Ext Time (p_c), s		0.0	0.3	2.6		0.5	0.1	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	36.0
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	778	780	84	5	10
Future Vol, veh/h	25	778	780	84	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	8	8
Mvmt Flow	27	828	830	89	5	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	919	0	-	0	1343	460
Stage 1	-	-	-	-	875	-
Stage 2	-	-	-	-	468	-
Critical Hdwy	4.14	-	-	-	6.96	7.06
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	2.22	-	-	-	3.58	3.38
Pot Cap-1 Maneuver	738	-	-	-	136	532
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	580	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	738	-	-	-	127	532
Mov Cap-2 Maneuver	-	-	-	-	127	-
Stage 1	-	-	-	-	330	-
Stage 2	-	-	-	-	580	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	19.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	738	-	-	-	258
HCM Lane V/C Ratio	0.036	-	-	-	0.062
HCM Control Delay (s)	10.1	0.3	-	-	19.9
HCM Lane LOS	B	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	763	850	75	91	15
Future Volume (veh/h)	20	763	850	75	91	15
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	22	848	944	83	101	17
Adj No. of Lanes	0	2	2	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	135	1883	1836	161	239	40
Arrive On Green	0.56	0.56	0.56	0.56	0.16	0.16
Sat Flow, veh/h	28	3462	3385	289	1510	254
Grp Volume(v), veh/h	460	410	507	520	119	0
Grp Sat Flow(s),veh/h/ln	1795	1610	1770	1812	1780	0
Q Serve(g_s), s	0.0	4.8	5.6	5.6	1.9	0.0
Cycle Q Clear(g_c), s	4.6	4.8	5.6	5.6	1.9	0.0
Prop In Lane	0.05			0.16	0.85	0.14
Lane Grp Cap(c), veh/h	1120	898	987	1010	281	0
V/C Ratio(X)	0.41	0.46	0.51	0.51	0.42	0.00
Avail Cap(c_a), veh/h	1376	1145	1258	1288	1096	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.1	4.2	4.3	4.3	12.0	0.0
Incr Delay (d2), s/veh	0.2	0.4	0.4	0.4	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.3	3.9	5.0	5.1	1.8	0.0
LnGrp Delay(d),s/veh	4.4	4.5	4.8	4.7	13.0	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		870	1027		119	
Approach Delay, s/veh		4.4	4.8		13.0	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				22.1		9.5		22.1
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				22.5		19.5		22.5
Max Q Clear Time (g_c+I1), s				6.8		3.9		7.6
Green Ext Time (p_c), s				10.4		0.3		10.0

Intersection Summary	
HCM 2010 Ctrl Delay	5.1
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	840	916	103	51	10
Future Vol, veh/h	14	840	916	103	51	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	16	966	1053	118	59	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1171	0	-	0	1627	586
Stage 1	-	-	-	-	1112	-
Stage 2	-	-	-	-	515	-
Critical Hdwy	4.14	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.22	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	592	-	-	-	95	459
Stage 1	-	-	-	-	281	-
Stage 2	-	-	-	-	570	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	592	-	-	-	89	459
Mov Cap-2 Maneuver	-	-	-	-	89	-
Stage 1	-	-	-	-	265	-
Stage 2	-	-	-	-	570	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	94.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	592	-	-	-	103
HCM Lane V/C Ratio	0.027	-	-	-	0.681
HCM Control Delay (s)	11.3	0.3	-	-	94.1
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	765	27	18	824	64	29	28	33	254	67	168
Future Volume (veh/h)	100	765	27	18	824	64	29	28	33	254	67	168
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	109	832	29	20	896	0	32	30	36	276	73	183
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	139	1669	58	41	1498	0	179	208	182	379	330	289
Arrive On Green	0.08	0.48	0.48	0.02	0.42	0.00	0.03	0.12	0.12	0.10	0.18	0.18
Sat Flow, veh/h	1774	3489	122	1774	3632	0	1792	1787	1562	1792	1787	1566
Grp Volume(v), veh/h	109	422	439	20	896	0	32	30	36	276	73	183
Grp Sat Flow(s),veh/h/ln	1774	1770	1841	1774	1770	0	1792	1787	1562	1792	1787	1566
Q Serve(g_s), s	3.8	10.4	10.4	0.7	12.5	0.0	0.0	1.0	1.3	2.0	2.2	6.9
Cycle Q Clear(g_c), s	3.8	10.4	10.4	0.7	12.5	0.0	0.0	1.0	1.3	2.0	2.2	6.9
Prop In Lane	1.00		0.07	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	846	881	41	1498	0	179	208	182	379	330	289
V/C Ratio(X)	0.78	0.50	0.50	0.48	0.60	0.00	0.18	0.14	0.20	0.73	0.22	0.63
Avail Cap(c_a), veh/h	181	846	881	139	1498	0	263	796	695	379	798	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	11.4	11.4	30.8	14.2	0.0	29.8	25.3	25.5	25.4	22.1	24.0
Incr Delay (d2), s/veh	11.3	2.1	2.0	3.2	1.8	0.0	0.2	0.1	0.2	6.1	0.1	0.9
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(95%),veh/ln	4.2	9.4	9.7	0.7	10.5	0.0	1.0	0.9	1.0	8.9	2.0	5.4
LnGrp Delay(d),s/veh	40.1	13.5	13.4	34.0	16.0	0.0	30.0	25.4	25.7	31.4	22.2	24.9
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		970			916			98			532	
Approach Delay, s/veh		16.4			16.4			27.0			27.9	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	11.9	6.0	35.0	6.5	16.3	9.5	31.5
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	5.1	28.4	5.0	28.5	5.0	28.5	6.5	27.0
Max Q Clear Time (g_c+I1), s	4.0	3.3	2.7	12.4	2.0	8.9	5.8	14.5
Green Ext Time (p_c), s	0.1	0.2	0.0	7.3	0.0	1.0	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	195	509	0
Future Vol, veh/h	0	2	2	195	509	0
Conflicting Peds, #/hr	0	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	4	1	0
Mvmt Flow	0	2	2	207	541	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	758	548	547	0	-	0
Stage 1	547	-	-	-	-	-
Stage 2	211	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	378	540	1033	-	-	-
Stage 1	584	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	373	536	1027	-	-	-
Mov Cap-2 Maneuver	470	-	-	-	-	-
Stage 1	579	-	-	-	-	-
Stage 2	824	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1027	-	536	-	-
HCM Lane V/C Ratio	0.002	-	0.004	-	-
HCM Control Delay (s)	8.5	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	3	8	144	467	4
Future Vol, veh/h	0	3	8	144	467	4
Conflicting Peds, #/hr	0	1	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3	9	164	531	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	721	540	541	0	-	0
Stage 1	539	-	-	-	-	-
Stage 2	182	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	394	542	1028	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	849	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	386	539	1023	-	-	-
Mov Cap-2 Maneuver	475	-	-	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	845	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1023	-	539	-	-
HCM Lane V/C Ratio	0.009	-	0.006	-	-
HCM Control Delay (s)	8.6	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	0	10	1	0	1
Future Vol, veh/h	3	0	10	1	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	17	0	0	0	0	2
Mvmt Flow	6	0	19	2	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	6	0	46	6
Stage 1	-	-	-	-	6	-
Stage 2	-	-	-	-	40	-
Critical Hdwy	-	-	4.1	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1628	-	969	1077
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	988	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1628	-	957	1077
Mov Cap-2 Maneuver	-	-	-	-	957	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	976	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.6	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1077	-	-	1628	-
HCM Lane V/C Ratio	0.002	-	-	0.011	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	0	110	3	0	126
Future Vol, veh/h	20	0	110	3	0	126
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	32	0	175	5	0	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	398	198	0	0	200	0
Stage 1	198	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	611	848	-	-	1384	-
Stage 1	840	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	599	832	-	-	1358	-
Mov Cap-2 Maneuver	599	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	599	1358	-
HCM Lane V/C Ratio	-	-	0.053	-	-
HCM Control Delay (s)	-	-	11.3	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	113	0	0	146
Future Vol, veh/h	0	0	113	0	0	146
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	153	0	0	197

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	370	173	0	0	173	0
Stage 1	173	-	-	-	-	-
Stage 2	197	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	634	876	-	-	1416	-
Stage 1	862	-	-	-	-	-
Stage 2	841	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	622	859	-	-	1389	-
Mov Cap-2 Maneuver	622	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	841	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1389	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	508	47	388	618	37	85	19	354	65	27	56
Future Volume (veh/h)	64	508	47	388	618	37	85	19	354	65	27	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	69	546	51	417	665	40	91	20	381	70	29	60
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	288	775	72	427	1228	74	624	655	810	140	42	87
Arrive On Green	0.04	0.23	0.23	0.17	0.36	0.36	0.35	0.35	0.35	0.08	0.08	0.08
Sat Flow, veh/h	1792	3300	307	1792	3424	206	1792	1881	1568	1792	539	1115
Grp Volume(v), veh/h	69	295	302	417	347	358	91	20	381	70	0	89
Grp Sat Flow(s),veh/h/ln	1792	1787	1820	1792	1787	1843	1792	1881	1568	1792	0	1654
Q Serve(g_s), s	3.3	17.4	17.5	19.0	17.8	17.8	4.0	0.8	18.0	4.3	0.0	6.0
Cycle Q Clear(g_c), s	3.3	17.4	17.5	19.0	17.8	17.8	4.0	0.8	18.0	4.3	0.0	6.0
Prop In Lane	1.00		0.17	1.00		0.11	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	288	420	427	427	641	661	624	655	810	140	0	129
V/C Ratio(X)	0.24	0.70	0.71	0.98	0.54	0.54	0.15	0.03	0.47	0.50	0.00	0.69
Avail Cap(c_a), veh/h	292	420	427	427	641	661	624	655	810	421	0	388
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.4	40.3	40.4	29.4	29.3	29.3	25.7	24.7	18.0	50.9	0.0	51.7
Incr Delay (d2), s/veh	0.2	9.5	9.5	37.3	3.3	3.2	0.5	0.1	2.0	1.0	0.0	2.5
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(95%),veh/ln	3.0	14.8	15.1	13.0	14.4	14.7	3.7	0.8	12.8	3.9	0.0	5.1
LnGrp Delay(d),s/veh	31.6	49.8	49.8	66.7	32.6	32.5	26.2	24.8	19.9	51.9	0.0	54.1
LnGrp LOS	C	D	D	E	C	C	C	C	B	D		D
Approach Vol, veh/h		666			1122			492			159	
Approach Delay, s/veh		47.9			45.3			21.3			53.1	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		45.0	24.0	32.0		14.0	9.7	46.3
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		22.0	19.0	27.0		27.0	5.0	41.0
Max Q Clear Time (g_c+I1), s		20.0	21.0	19.5		8.0	5.3	19.8
Green Ext Time (p_c), s		0.3	0.0	3.2		0.4	0.0	5.2

Intersection Summary	
HCM 2010 Ctrl Delay	41.7
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	932	1040	14	40	20
Future Vol, veh/h	1	932	1040	14	40	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	1	971	1083	15	42	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1098	0	-	0	1579	549
Stage 1	-	-	-	-	1091	-
Stage 2	-	-	-	-	488	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	637	-	-	-	102	485
Stage 1	-	-	-	-	288	-
Stage 2	-	-	-	-	588	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	637	-	-	-	102	485
Mov Cap-2 Maneuver	-	-	-	-	102	-
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	588	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	51.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	637	-	-	-	138
HCM Lane V/C Ratio	0.002	-	-	-	0.453
HCM Control Delay (s)	10.7	0	-	-	51.1
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	973	1008	13	85	40
Future Volume (veh/h)	4	973	1008	13	85	40
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	4	1024	1061	14	89	42
Adj No. of Lanes	0	2	2	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	64	1524	1573	21	479	226
Arrive On Green	0.44	0.44	0.44	0.44	0.41	0.41
Sat Flow, veh/h	3	3584	3706	48	1170	552
Grp Volume(v), veh/h	551	477	525	550	132	0
Grp Sat Flow(s),veh/h/ln	1874	1626	1787	1873	1736	0
Q Serve(g_s), s	0.0	13.6	13.6	13.6	2.8	0.0
Cycle Q Clear(g_c), s	13.5	13.6	13.6	13.6	2.8	0.0
Prop In Lane	0.01			0.03	0.67	0.32
Lane Grp Cap(c), veh/h	879	708	778	816	710	0
V/C Ratio(X)	0.63	0.67	0.67	0.67	0.19	0.00
Avail Cap(c_a), veh/h	982	799	878	920	710	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.1	13.1	13.1	13.1	11.0	0.0
Incr Delay (d2), s/veh	1.1	1.9	1.7	1.7	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.5	10.7	11.5	11.9	2.6	0.0
LnGrp Delay(d),s/veh	14.1	15.0	14.8	14.8	11.5	0.0
LnGrp LOS	B	B	B	B	B	
Approach Vol, veh/h		1028	1075		132	
Approach Delay, s/veh		14.5	14.8		11.5	
Approach LOS		B	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				29.8		28.2		29.8
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				28.5		20.5		28.5
Max Q Clear Time (g_c+I1), s				15.6		4.8		15.6
Green Ext Time (p_c), s				9.7		0.3		9.6

Intersection Summary	
HCM 2010 Ctrl Delay	14.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1030	1004	13	52	7
Future Vol, veh/h	3	1030	1004	13	52	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	3	1096	1068	14	55	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1082	0	-	0	1629	541
Stage 1	-	-	-	-	1075	-
Stage 2	-	-	-	-	554	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	646	-	-	-	94	491
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	545	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	646	-	-	-	93	491
Mov Cap-2 Maneuver	-	-	-	-	93	-
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	545	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	83.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	646	-	-	-	103
HCM Lane V/C Ratio	0.005	-	-	-	0.609
HCM Control Delay (s)	10.6	0.1	-	-	83.6
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	860	59	79	824	243	32	108	81	204	70	147
Future Volume (veh/h)	154	860	59	79	824	243	32	108	81	204	70	147
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.96	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	160	896	61	82	858	0	33	112	84	212	73	153
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	199	1532	104	105	1426	0	287	300	204	351	339	296
Arrive On Green	0.11	0.45	0.45	0.06	0.40	0.00	0.03	0.15	0.15	0.08	0.19	0.19
Sat Flow, veh/h	1792	3396	231	1792	3668	0	1810	2020	1373	1792	1787	1558
Grp Volume(v), veh/h	160	472	485	82	858	0	33	99	97	212	73	153
Grp Sat Flow(s),veh/h/ln	1792	1787	1840	1792	1787	0	1810	1805	1588	1792	1787	1558
Q Serve(g_s), s	5.9	13.3	13.3	3.1	12.8	0.0	1.0	3.3	3.8	5.1	2.3	6.0
Cycle Q Clear(g_c), s	5.9	13.3	13.3	3.1	12.8	0.0	1.0	3.3	3.8	5.1	2.3	6.0
Prop In Lane	1.00		0.13	1.00		0.00	1.00		0.86	1.00		1.00
Lane Grp Cap(c), veh/h	199	806	830	105	1426	0	287	268	236	351	339	296
V/C Ratio(X)	0.80	0.58	0.58	0.78	0.60	0.00	0.12	0.37	0.41	0.60	0.22	0.52
Avail Cap(c_a), veh/h	204	806	830	172	1426	0	358	726	638	351	721	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	13.8	13.8	31.4	16.1	0.0	23.1	25.9	26.1	24.2	23.2	24.6
Incr Delay (d2), s/veh	18.6	3.1	3.0	4.6	1.9	0.0	0.1	0.3	0.4	2.1	0.1	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(95%),veh/ln	7.1	11.7	11.9	2.9	10.9	0.0	0.9	3.0	3.0	2.6	2.1	4.7
LnGrp Delay(d),s/veh	48.0	16.9	16.9	36.0	18.0	0.0	23.2	26.3	26.5	26.2	23.3	25.1
LnGrp LOS	D	B	B	D	B		C	C	C	C	C	C
Approach Vol, veh/h		1117			940			229			438	
Approach Delay, s/veh		21.3			19.5			25.9			25.4	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	14.6	8.5	35.0	6.8	17.3	12.0	31.5
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	5.1	27.2	6.5	28.2	5.0	27.3	7.7	27.0
Max Q Clear Time (g_c+I1), s	7.1	5.8	5.1	15.3	3.0	8.0	7.9	14.8
Green Ext Time (p_c), s	0.0	1.7	0.0	6.7	0.0	1.6	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	21.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	587	343	0
Future Vol, veh/h	0	4	1	587	343	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	4	1	638	373	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1016	376	376	0	-	0
Stage 1	376	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	266	675	1194	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	264	673	1191	-	-	-
Mov Cap-2 Maneuver	390	-	-	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	527	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1191	-	673	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	8	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	14	445	361	1
Future Vol, veh/h	2	8	14	445	361	1
Conflicting Peds, #/hr	0	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	2	9	15	473	384	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	890	388	387	0	-	0
Stage 1	387	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	316	665	1183	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	309	663	1181	-	-	-
Mov Cap-2 Maneuver	434	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	611	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1181	-	600	-	-
HCM Lane V/C Ratio	0.013	-	0.018	-	-
HCM Control Delay (s)	8.1	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	0	0	15	1	5
Future Vol, veh/h	5	0	0	15	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	0	0	22	1	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	7	0	29	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	22	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1627	-	991	1081
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1006	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1627	-	991	1081
Mov Cap-2 Maneuver	-	-	-	-	991	-
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1006	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1065	-	-	1627	-
HCM Lane V/C Ratio	0.008	-	-	-	-
HCM Control Delay (s)	8.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	0	257	70	0	157
Future Vol, veh/h	15	0	257	70	0	157
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	33	0	2	2	0	0
Mvmt Flow	28	0	476	130	0	291

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	882	591	0	0	656	0
Stage 1	591	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.73	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	280	511	-	-	941	-
Stage 1	497	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	267	487	-	-	896	-
Mov Cap-2 Maneuver	267	-	-	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	693	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	267	896	-
HCM Lane V/C Ratio	-	-	0.104	-	-
HCM Control Delay (s)	-	-	20	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	330	0	0	166
Future Vol, veh/h	0	0	330	0	0	166
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	0	0	2	0	0	33
Mvmt Flow	0	0	611	0	0	307

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	968	661	0	0	661	0
Stage 1	661	-	-	-	-	-
Stage 2	307	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	284	466	-	-	937	-
Stage 1	517	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	270	444	-	-	892	-
Mov Cap-2 Maneuver	270	-	-	-	-	-
Stage 1	492	-	-	-	-	-
Stage 2	751	-	-	-	-	-

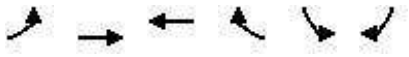
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	892	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	401	70	467	250	73	36	67	354	48	46	72
Future Volume (veh/h)	190	401	70	467	250	73	36	67	354	48	46	72
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1863	1863	1900	1863	1863	1863	1743	1743	1900
Adj Flow Rate, veh/h	224	472	82	549	294	86	42	79	416	56	54	85
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	9	9	9
Cap, veh/h	506	731	126	583	1018	293	355	373	692	216	78	123
Arrive On Green	0.11	0.25	0.25	0.24	0.38	0.38	0.20	0.20	0.20	0.13	0.13	0.13
Sat Flow, veh/h	1757	2979	514	1774	2714	780	1774	1863	1542	1660	601	946
Grp Volume(v), veh/h	224	276	278	549	190	190	42	79	416	56	0	139
Grp Sat Flow(s),veh/h/ln	1757	1752	1741	1774	1770	1724	1774	1863	1542	1660	0	1547
Q Serve(g_s), s	10.3	15.5	15.7	24.3	8.3	8.5	2.1	3.9	22.0	3.3	0.0	9.4
Cycle Q Clear(g_c), s	10.3	15.5	15.7	24.3	8.3	8.5	2.1	3.9	22.0	3.3	0.0	9.4
Prop In Lane	1.00		0.30	1.00		0.45	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	506	430	427	583	664	647	355	373	692	216	0	201
V/C Ratio(X)	0.44	0.64	0.65	0.94	0.29	0.29	0.12	0.21	0.60	0.26	0.00	0.69
Avail Cap(c_a), veh/h	548	430	427	620	664	647	355	373	692	408	0	380
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	37.2	37.2	22.4	24.0	24.1	36.0	36.8	23.4	43.1	0.0	45.7
Incr Delay (d2), s/veh	0.2	7.2	7.4	21.7	1.1	1.2	0.1	0.1	1.0	0.2	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.6	13.1	13.2	21.7	7.6	7.7	1.9	3.6	15.0	2.8	0.0	7.5
LnGrp Delay(d),s/veh	26.2	44.4	44.7	44.1	25.1	25.3	36.1	36.9	24.4	43.3	0.0	47.3
LnGrp LOS	C	D	D	D	C	C	D	D	C	D		D
Approach Vol, veh/h		778			929			537			195	
Approach Delay, s/veh		39.3			36.3			27.2			46.1	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		27.0	31.7	32.0		19.3	17.4	46.3
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		22.0	29.0	27.0		27.0	15.0	41.0
Max Q Clear Time (g_c+I1), s		24.0	26.3	17.7		11.4	12.3	10.5
Green Ext Time (p_c), s		0.0	0.3	2.6		0.5	0.1	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	36.0
HCM 2010 LOS	D



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	778	780	84	86	10
Future Volume (veh/h)	25	778	780	84	86	10
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1759	1900
Adj Flow Rate, veh/h	27	828	830	89	91	11
Adj No. of Lanes	0	2	2	0	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	141	1881	1807	194	230	28
Arrive On Green	0.56	0.56	0.56	0.56	0.16	0.16
Sat Flow, veh/h	38	3441	3319	346	1462	177
Grp Volume(v), veh/h	451	404	455	464	103	0
Grp Sat Flow(s),veh/h/ln	1784	1610	1770	1802	1655	0
Q Serve(g_s), s	0.0	4.7	4.9	4.9	1.8	0.0
Cycle Q Clear(g_c), s	4.5	4.7	4.9	4.9	1.8	0.0
Prop In Lane	0.06			0.19	0.88	0.11
Lane Grp Cap(c), veh/h	1119	902	992	1010	260	0
V/C Ratio(X)	0.40	0.45	0.46	0.46	0.40	0.00
Avail Cap(c_a), veh/h	1518	1290	1417	1443	1065	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.1	4.1	4.1	4.1	12.1	0.0
Incr Delay (d2), s/veh	0.2	0.3	0.3	0.3	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.2	3.8	4.3	4.3	1.6	0.0
LnGrp Delay(d),s/veh	4.3	4.5	4.5	4.5	13.0	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		855	919		103	
Approach Delay, s/veh		4.4	4.5		13.0	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				22.3		9.5		22.3
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				25.5		20.5		25.5
Max Q Clear Time (g_c+I1), s				6.7		3.8		6.9
Green Ext Time (p_c), s				11.1		0.2		11.0

Intersection Summary	
HCM 2010 Ctrl Delay	4.9
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	864	850	75	0	15
Future Vol, veh/h	0	864	850	75	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	0	960	944	83	0	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	514
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	511
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	511
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	511
HCM Lane V/C Ratio	-	-	-	0.033
HCM Control Delay (s)	-	-	-	12.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	875	916	103	61	10
Future Volume (veh/h)	34	875	916	103	61	10
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	39	1006	1053	118	70	11
Adj No. of Lanes	0	2	2	0	0	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	137	2022	1981	222	208	33
Arrive On Green	0.62	0.62	0.62	0.62	0.14	0.14
Sat Flow, veh/h	50	3361	3303	359	1521	239
Grp Volume(v), veh/h	541	504	580	591	82	0
Grp Sat Flow(s),veh/h/ln	1717	1610	1770	1799	1782	0
Q Serve(g_s), s	0.0	6.4	6.8	6.8	1.5	0.0
Cycle Q Clear(g_c), s	5.7	6.4	6.8	6.8	1.5	0.0
Prop In Lane	0.07			0.20	0.85	0.13
Lane Grp Cap(c), veh/h	1165	994	1092	1110	244	0
V/C Ratio(X)	0.46	0.51	0.53	0.53	0.34	0.00
Avail Cap(c_a), veh/h	1373	1211	1331	1353	902	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	3.8	3.9	4.0	4.0	14.3	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.4	0.4	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.3	5.0	6.0	6.1	1.5	0.0
LnGrp Delay(d),s/veh	4.1	4.3	4.4	4.4	15.1	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		1045	1171		82	
Approach Delay, s/veh		4.2	4.4		15.1	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				27.1		9.5		27.1
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				27.5		18.5		27.5
Max Q Clear Time (g_c+I1), s				8.4		3.5		8.8
Green Ext Time (p_c), s				14.0		0.1		13.7

Intersection Summary	
HCM 2010 Ctrl Delay	4.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	765	27	18	824	64	29	28	33	254	67	168
Future Volume (veh/h)	100	765	27	18	824	64	29	28	33	254	67	168
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1881	1881	1900	1881	1881	1900
Adj Flow Rate, veh/h	109	832	29	20	896	0	32	30	36	276	73	183
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	139	1669	58	41	1498	0	179	208	182	379	330	289
Arrive On Green	0.08	0.48	0.48	0.02	0.42	0.00	0.03	0.12	0.12	0.10	0.18	0.18
Sat Flow, veh/h	1774	3489	122	1774	3632	0	1792	1787	1562	1792	1787	1566
Grp Volume(v), veh/h	109	422	439	20	896	0	32	30	36	276	73	183
Grp Sat Flow(s),veh/h/ln	1774	1770	1841	1774	1770	0	1792	1787	1562	1792	1787	1566
Q Serve(g_s), s	3.8	10.4	10.4	0.7	12.5	0.0	0.0	1.0	1.3	2.0	2.2	6.9
Cycle Q Clear(g_c), s	3.8	10.4	10.4	0.7	12.5	0.0	0.0	1.0	1.3	2.0	2.2	6.9
Prop In Lane	1.00		0.07	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	846	881	41	1498	0	179	208	182	379	330	289
V/C Ratio(X)	0.78	0.50	0.50	0.48	0.60	0.00	0.18	0.14	0.20	0.73	0.22	0.63
Avail Cap(c_a), veh/h	181	846	881	139	1498	0	263	796	695	379	798	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	11.4	11.4	30.8	14.2	0.0	29.8	25.3	25.5	25.4	22.1	24.0
Incr Delay (d2), s/veh	11.3	2.1	2.0	3.2	1.8	0.0	0.2	0.1	0.2	6.1	0.1	0.9
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(95%),veh/ln	4.2	9.4	9.7	0.7	10.5	0.0	1.0	0.9	1.0	8.9	2.0	5.4
LnGrp Delay(d),s/veh	40.1	13.5	13.4	34.0	16.0	0.0	30.0	25.4	25.7	31.4	22.2	24.9
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		970			916			98			532	
Approach Delay, s/veh		16.4			16.4			27.0			27.9	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	11.9	6.0	35.0	6.5	16.3	9.5	31.5
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	5.1	28.4	5.0	28.5	5.0	28.5	6.5	27.0
Max Q Clear Time (g_c+I1), s	4.0	3.3	2.7	12.4	2.0	8.9	5.8	14.5
Green Ext Time (p_c), s	0.1	0.2	0.0	7.3	0.0	1.0	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	195	509	0
Future Vol, veh/h	0	2	2	195	509	0
Conflicting Peds, #/hr	0	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	4	1	0
Mvmt Flow	0	2	2	207	541	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	758	548	547	0	-	0
Stage 1	547	-	-	-	-	-
Stage 2	211	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	378	540	1033	-	-	-
Stage 1	584	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	373	536	1027	-	-	-
Mov Cap-2 Maneuver	470	-	-	-	-	-
Stage 1	579	-	-	-	-	-
Stage 2	824	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1027	-	536	-	-
HCM Lane V/C Ratio	0.002	-	0.004	-	-
HCM Control Delay (s)	8.5	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	3	8	144	467	4
Future Vol, veh/h	0	3	8	144	467	4
Conflicting Peds, #/hr	0	1	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3	9	164	531	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	721	540	541	0	-	0
Stage 1	539	-	-	-	-	-
Stage 2	182	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	394	542	1028	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	849	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	386	539	1023	-	-	-
Mov Cap-2 Maneuver	475	-	-	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	845	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1023	-	539	-	-
HCM Lane V/C Ratio	0.009	-	0.006	-	-
HCM Control Delay (s)	8.6	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	0	10	1	0	1
Future Vol, veh/h	3	0	10	1	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	17	0	0	0	0	2
Mvmt Flow	6	0	19	2	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	6	0	46	6
Stage 1	-	-	-	-	6	-
Stage 2	-	-	-	-	40	-
Critical Hdwy	-	-	4.1	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1628	-	969	1077
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	988	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1628	-	957	1077
Mov Cap-2 Maneuver	-	-	-	-	957	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	976	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.6	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1077	-	-	1628	-
HCM Lane V/C Ratio	0.002	-	-	0.011	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	0	110	3	0	126
Future Vol, veh/h	20	0	110	3	0	126
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	32	0	175	5	0	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	398	198	0	0	200	0
Stage 1	198	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	611	848	-	-	1384	-
Stage 1	840	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	599	832	-	-	1358	-
Mov Cap-2 Maneuver	599	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	599	1358	-
HCM Lane V/C Ratio	-	-	0.053	-	-
HCM Control Delay (s)	-	-	11.3	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	113	0	0	146
Future Vol, veh/h	0	0	113	0	0	146
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	153	0	0	197

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	370	173	0	0	173	0
Stage 1	173	-	-	-	-	-
Stage 2	197	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	634	876	-	-	1416	-
Stage 1	862	-	-	-	-	-
Stage 2	841	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	622	859	-	-	1389	-
Mov Cap-2 Maneuver	622	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	841	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1389	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	508	47	388	618	37	85	19	354	65	27	56
Future Volume (veh/h)	64	508	47	388	618	37	85	19	354	65	27	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1881	1881	1881	1881	1881	1900
Adj Flow Rate, veh/h	69	546	51	417	665	40	91	20	381	70	29	60
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	288	775	72	427	1228	74	624	655	810	140	42	87
Arrive On Green	0.04	0.23	0.23	0.17	0.36	0.36	0.35	0.35	0.35	0.08	0.08	0.08
Sat Flow, veh/h	1792	3300	307	1792	3424	206	1792	1881	1568	1792	539	1115
Grp Volume(v), veh/h	69	295	302	417	347	358	91	20	381	70	0	89
Grp Sat Flow(s),veh/h/ln	1792	1787	1820	1792	1787	1843	1792	1881	1568	1792	0	1654
Q Serve(g_s), s	3.3	17.4	17.5	19.0	17.8	17.8	4.0	0.8	18.0	4.3	0.0	6.0
Cycle Q Clear(g_c), s	3.3	17.4	17.5	19.0	17.8	17.8	4.0	0.8	18.0	4.3	0.0	6.0
Prop In Lane	1.00		0.17	1.00		0.11	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	288	420	427	427	641	661	624	655	810	140	0	129
V/C Ratio(X)	0.24	0.70	0.71	0.98	0.54	0.54	0.15	0.03	0.47	0.50	0.00	0.69
Avail Cap(c_a), veh/h	292	420	427	427	641	661	624	655	810	421	0	388
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.4	40.3	40.4	29.4	29.3	29.3	25.7	24.7	18.0	50.9	0.0	51.7
Incr Delay (d2), s/veh	0.2	9.5	9.5	29.8	2.2	2.1	0.5	0.1	2.0	1.0	0.0	2.5
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(95%),veh/ln	3.0	14.8	15.1	11.1	13.2	13.6	3.7	0.8	12.8	3.9	0.0	5.1
LnGrp Delay(d),s/veh	31.6	49.8	49.8	59.2	31.5	31.5	26.2	24.8	19.9	51.9	0.0	54.1
LnGrp LOS	C	D	D	E	C	C	C	C	B	D		D
Approach Vol, veh/h		666			1122			492			159	
Approach Delay, s/veh		47.9			41.8			21.3			53.1	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		45.0	24.0	32.0		14.0	9.7	46.3
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		22.0	19.0	27.0		27.0	5.0	41.0
Max Q Clear Time (g_c+I1), s		20.0	21.0	19.5		8.0	5.3	19.8
Green Ext Time (p_c), s		0.3	0.0	3.2		0.4	0.0	5.2

Intersection Summary	
HCM 2010 Ctrl Delay	40.1
HCM 2010 LOS	D

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	928	1040	14	90	20
Future Volume (veh/h)	5	928	1040	14	90	20
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	5	967	1083	15	94	21
Adj No. of Lanes	0	2	2	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	73	1644	1699	24	507	113
Arrive On Green	0.47	0.47	0.47	0.47	0.35	0.35
Sat Flow, veh/h	4	3580	3704	50	1436	321
Grp Volume(v), veh/h	520	452	536	562	116	0
Grp Sat Flow(s),veh/h/ln	1872	1626	1787	1872	1772	0
Q Serve(g_s), s	0.0	10.4	11.6	11.6	2.3	0.0
Cycle Q Clear(g_c), s	10.3	10.4	11.6	11.6	2.3	0.0
Prop In Lane	0.01			0.03	0.81	0.18
Lane Grp Cap(c), veh/h	952	765	841	881	625	0
V/C Ratio(X)	0.55	0.59	0.64	0.64	0.19	0.00
Avail Cap(c_a), veh/h	1096	893	981	1028	625	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.9	9.9	10.2	10.2	11.4	0.0
Incr Delay (d2), s/veh	0.5	0.8	1.1	1.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.1	8.2	9.9	10.3	2.2	0.0
LnGrp Delay(d),s/veh	10.4	10.7	11.3	11.2	12.1	0.0
LnGrp LOS	B	B	B	B	B	
Approach Vol, veh/h		972	1098		116	
Approach Delay, s/veh		10.5	11.3		12.1	
Approach LOS		B	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				28.5		22.5		28.5
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				28.0		18.0		28.0
Max Q Clear Time (g_c+I1), s				12.4		4.3		13.6
Green Ext Time (p_c), s				11.1		0.2		10.4

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1023	1008	13	0	40
Future Vol, veh/h	0	1023	1008	13	0	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	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	1077	1061	14	0	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	538
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	493
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	493
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	493
HCM Lane V/C Ratio	-	-	-	0.085
HCM Control Delay (s)	-	-	-	13
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	995	1004	13	87	7
Future Volume (veh/h)	3	995	1004	13	87	7
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1881	1900	1900	1900
Adj Flow Rate, veh/h	3	1059	1068	14	93	7
Adj No. of Lanes	0	2	2	0	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	104	2101	2167	28	236	18
Arrive On Green	0.60	0.60	0.60	0.60	0.14	0.14
Sat Flow, veh/h	2	3587	3707	47	1653	124
Grp Volume(v), veh/h	569	493	528	554	101	0
Grp Sat Flow(s),veh/h/ln	1877	1626	1787	1873	1795	0
Q Serve(g_s), s	0.0	6.1	5.9	5.9	1.8	0.0
Cycle Q Clear(g_c), s	6.1	6.1	5.9	5.9	1.8	0.0
Prop In Lane	0.01			0.03	0.92	0.07
Lane Grp Cap(c), veh/h	1229	976	1072	1123	257	0
V/C Ratio(X)	0.46	0.51	0.49	0.49	0.39	0.00
Avail Cap(c_a), veh/h	1522	1232	1354	1418	1001	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.0	4.0	4.0	4.0	13.6	0.0
Incr Delay (d2), s/veh	0.3	0.4	0.4	0.3	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.6	4.9	5.2	5.4	1.7	0.0
LnGrp Delay(d),s/veh	4.3	4.4	4.3	4.3	14.6	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		1062	1082		101	
Approach Delay, s/veh		4.4	4.3		14.6	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				25.5		9.5		25.5
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				26.5		19.5		26.5
Max Q Clear Time (g_c+I1), s				8.1		3.8		7.9
Green Ext Time (p_c), s				12.9		0.2		13.0

Intersection Summary	
HCM 2010 Ctrl Delay	4.8
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	860	59	79	824	243	32	108	81	204	70	147
Future Volume (veh/h)	154	860	59	79	824	243	32	108	81	204	70	147
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.96	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1881	1881	1900	1900	1900	1900	1881	1881	1900
Adj Flow Rate, veh/h	160	896	61	82	858	0	33	112	84	212	73	153
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	199	1532	104	105	1426	0	287	300	204	351	339	296
Arrive On Green	0.11	0.45	0.45	0.06	0.40	0.00	0.03	0.15	0.15	0.08	0.19	0.19
Sat Flow, veh/h	1792	3396	231	1792	3668	0	1810	2020	1373	1792	1787	1558
Grp Volume(v), veh/h	160	472	485	82	858	0	33	99	97	212	73	153
Grp Sat Flow(s),veh/h/ln	1792	1787	1840	1792	1787	0	1810	1805	1588	1792	1787	1558
Q Serve(g_s), s	5.9	13.3	13.3	3.1	12.8	0.0	1.0	3.3	3.8	5.1	2.3	6.0
Cycle Q Clear(g_c), s	5.9	13.3	13.3	3.1	12.8	0.0	1.0	3.3	3.8	5.1	2.3	6.0
Prop In Lane	1.00		0.13	1.00		0.00	1.00		0.86	1.00		1.00
Lane Grp Cap(c), veh/h	199	806	830	105	1426	0	287	268	236	351	339	296
V/C Ratio(X)	0.80	0.58	0.58	0.78	0.60	0.00	0.12	0.37	0.41	0.60	0.22	0.52
Avail Cap(c_a), veh/h	204	806	830	172	1426	0	358	726	638	351	721	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	13.8	13.8	31.4	16.1	0.0	23.1	25.9	26.1	24.2	23.2	24.6
Incr Delay (d2), s/veh	18.6	3.1	3.0	4.6	1.9	0.0	0.1	0.3	0.4	2.1	0.1	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(95%),veh/ln	7.1	11.7	11.9	2.9	10.9	0.0	0.9	3.0	3.0	2.6	2.1	4.7
LnGrp Delay(d),s/veh	48.0	16.9	16.9	36.0	18.0	0.0	23.2	26.3	26.5	26.2	23.3	25.1
LnGrp LOS	D	B	B	D	B		C	C	C	C	C	C
Approach Vol, veh/h		1117			940			229			438	
Approach Delay, s/veh		21.3			19.5			25.9			25.4	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	14.6	8.5	35.0	6.8	17.3	12.0	31.5
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	5.1	27.2	6.5	28.2	5.0	27.3	7.7	27.0
Max Q Clear Time (g_c+I1), s	7.1	5.8	5.1	15.3	3.0	8.0	7.9	14.8
Green Ext Time (p_c), s	0.0	1.7	0.0	6.7	0.0	1.6	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	21.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	587	343	0
Future Vol, veh/h	0	4	1	587	343	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	4	1	638	373	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1016	376	376	0	-	0
Stage 1	376	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	266	675	1194	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	264	673	1191	-	-	-
Mov Cap-2 Maneuver	390	-	-	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	527	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1191	-	673	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	8	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	14	445	361	1
Future Vol, veh/h	2	8	14	445	361	1
Conflicting Peds, #/hr	0	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	2	9	15	473	384	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	890	388	387	0	-	0
Stage 1	387	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	316	665	1183	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	309	663	1181	-	-	-
Mov Cap-2 Maneuver	434	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	611	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1181	-	600	-	-
HCM Lane V/C Ratio	0.013	-	0.018	-	-
HCM Control Delay (s)	8.1	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	0	0	15	1	5
Future Vol, veh/h	5	0	0	15	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	0	0	22	1	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	7	0	29	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	22	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1627	-	991	1081
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1006	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1627	-	991	1081
Mov Cap-2 Maneuver	-	-	-	-	991	-
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1006	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1065	-	-	1627	-
HCM Lane V/C Ratio	0.008	-	-	-	-
HCM Control Delay (s)	8.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

7 MAY 2021

Appendix 3B: Transportation Impact Analysis - Supplemental Memo

July 31, 2020

To: Craig Tompkins, AIA, LEED AP
SRG Partnership, Inc.

From: Jeff Hee, Transportation Solutions, Inc.

Subject: Western State Hospital Master Plan Updated Bed Matrix
Summary of Preliminary Traffic Analysis Findings

This memorandum updated the January 2020 traffic analysis findings for the Western State Hospital campus Master Plan with the current bed matrix from May 2020.

Table 1 summarizes the current bed matrix.

Table 1: Bed Matrix

	Baseline Bed Total		Master Plan Bed Total		Long-Term Bed Total Beyond 10 yrs.
	2019 Existing	In-Development [1]	Near-Term 1 to 5 yrs.	Mid-Term 6 to 10 yrs.	
Breakdown by Type					
Total Beds	862	978	923	748	814
Total Civil Beds	470	470	415	153	201
Total Forensic Beds	345	443	443	530	530
Total Adolescent Beds	47	65	65	65	83
Breakdown by Use					
Civil/Forensic Beds	815	913	858	333	333
CSTC Beds	47	65	65	65	83
New CFS Hospital Beds	0	0	0	350	350
Community RTF Beds	0	0	0	0	48
Total Beds	862	978	923	748	814

1. Build-Out already permitted on the campus

A vicinity map and Master Plan site plan are attached as Figures 1 and 2.

Trip Generation

Table 2 summarizes the daily and peak hour trip generation rates computed from the existing campus' beds.

Table 2: Existing Peak Hour and Daily Trip Generation Rates

	2019 Exist. # of Beds	2019 Existing Trips Generated [1]	2019 Existing % In/Out	Trip Rate (Trips/Bed)
AM Generator (6:30-7:30 AM)	862	828	66/34	0.91
AM Peak Hour (7:00-8:00 AM)	862	677	67/33	0.75
PM Generator (2:15-3:15 PM)	862	764	41/59	0.84
PM Peak Hour (4:00-5:00 PM)	862	366	16/84	0.40
Daily Trips	862	6,046	48/52	6.67

1. Based on traffic volumes collected at the existing Western State Campus, May/July 2019

Table 3 summarizes the trip generation forecast based on the proposed in-development, near-term, mid-term and long-term development proposal.

Table 3: Trip Generation Forecast by Build-Out Scenario

In-Development	Trip Rate (Trips/Bed) [1]	In-Dev. # of Beds	In-Dev. Trips	Change from Existing	Near-Term # of Beds	Near-Term Trips	Change from In-Dev.
AM Generator (6:30-7:30 AM)	0.91	978	939	+111	923	887	(52)
AM Peak Hour (7:00-8:00 AM)	**0.75**	**978**	**768**	**+91**	**923**	**725**	**(43)**
PM Generator (2:15-3:15 PM)	0.84	978	867	+103	923	818	(49)
PM Peak Hour (4:00-5:00 PM)	**0.40**	**978**	**415**	**+49**	**923**	**392**	**(23)**
Daily Trips	6.67	978	6,860	+814	923	6,474	(386)
Near-Term	**Trip Rate [1]**	**Mid-Term # of Beds**	**Mid-Term Trips**	**Change from Near-Term**	**Long-Term # of Beds**	**Long-Term Trips**	**Change from Near-Term**
AM Generator (6:30-7:30 AM)	0.91	748	718	(169)	814	782	+64
AM Peak Hour (7:00-8:00 AM)	**0.75**	**748**	**587**	**(138)**	**814**	**639**	**+52**
PM Generator (2:15-3:15 PM)	0.84	748	663	(155)	814	721	+58
PM Peak Hour (4:00-5:00 PM)	**0.40**	**748**	**318**	**(74)**	**814**	**345**	**+27**
Daily Trips	6.67	748	5,246	(1,228)	814	5,709	+463

1. Trip Rate (Trips/Bed) from Table 2

The January 2020 Traffic Impact Analysis focused on analyses of AM peak hour (7:00-8:00 AM) and PM peak hour (4:00-5:00 PM) traffic conditions, representing the times when the volume of traffic, or traffic congestion, on the local roadways are highest.

Table 4 compares the AM and PM peak hour trips generated at the major campus accesses. For reporting, the driveways on Sentinel Drive at West Street and South Street are combined and Kids First Place and access to the former golf course/existing gravel lot are combined.

Table 4: AM and PM Peak Hour Site Trips by Driveway

AM Peak Hour	Sentinel Drive			Chapel Gate Dr.			Circle Drive			CSTC East Drwy.			Golf Course Rd.		
7:00-8:00 AM	In	Out	Tot.	In	Out	Tot.	In	Out	Tot.	In	Out	Tot.	In	Out	Tot.
2019 Existing	85	14	99	117	16	133	124	134	258	118	56	174	11	2	13
In-Development	85	14	99	117	16	133	151	148	299	148	72	220	15	2	17
Near-Term (1-5 yrs.)	85	14	99	117	16	133	136	140	276	134	66	200	15	2	17
Mid-Term (6-10 yrs.)	73	12	85	101	13	114	102	113	215	105	53	158	14	2	16
Long-Term (10+ yrs.)	73	12	85	101	13	114	102	113	215	138	68	206	17	3	20
PM Peak Hour	**Sentinel Drive**			**Chapel Gate Dr.**			**Circle Drive**			**CSTC East Drwy.**			**Golf Course Rd.**		
4:00-5:00 PM	**In**	**Out**	**Tot.**	**In**	**Out**	**Tot.**	**In**	**Out**	**Tot.**	**In**	**Out**	**Tot.**	**In**	**Out**	**Tot.**
2019 Existing	3	20	23	9	70	79	18	157	175	11	50	61	19	9	28
In-Development	3	20	23	9	70	79	20	184	204	14	63	77	22	11	33
Near-Term (1-5 yrs.)	3	20	23	9	70	79	19	169	188	13	58	71	20	11	31
Mid-Term (6-10 yrs.)	3	17	20	8	61	69	15	131	146	11	47	58	15	10	25
Long-Term (10+ yrs.)	3	17	20	8	61	69	15	131	146	15	68	83	15	12	27

Under the proposed Master Plan, the Near-Term and Mid-Term conditions and the Long-Term condition include closing the South Street campus access.

Figures 3 through 5 illustrates the campus Existing, In-Development and Long-Term AM and PM peak hour trips. Peak hour trips were distributed to the campus based on the current distribution of campus traffic at the site accesses and based on the long-term redevelopment of the campus.

Intersection Level-of-Service

Table 5 summarizes the intersection LOS and delay analyses for the study intersections and campus driveways. The LOS and delay computations were updated to the current HCM 6 methodologies.

Future conditions include a 1% annual growth which represents background traffic growth in the study area. Traffic generated by the high school and campus were not "increased" by the growth rate.

- The campus trips were distributed based on the existing conditions. Figure 6 illustrates the existing AM (7:00-8:00 AM) and PM (4:00-5:00 PM) peak hour study intersection turning movement volumes.
- In-Development conditions represent build-out already permitted on the campus. The proposed Master Plan is forecast to generate less trips compared to the In-Development condition.
- Year 2024 In-Development conditions include traffic growth between 2019 and 2024 and assumes the In-Development conditions are still active. This baseline scenario assumes more development than the proposed Near-Term (1-5 years) Master Plan conditions and is conservative. Figure 7 illustrates the future year 2024 peak hour turning movement volumes with In-Development conditions.
- Year 2030 In-Development conditions include traffic growth between 2019 and 2030 and represent the future baseline conditions without the Master Plan. This condition replaces the "No Action" condition in the January 2020 traffic impact analysis report. Figure 8 illustrates the future year peak hour turning movement volumes with 2030 In-Development conditions.
- Year 2030 Long-Term conditions include traffic growth between 2019 and 2030 and represent the full build-out of the Master Plan plus plans for additional CSTC beds and a new community RTF facility beyond the Master Plan. The 2030 Long-Term conditions assume the South Street driveway is closed. The Long-Term condition generates up to 9% more traffic than the Master Plan's Mid-Term conditions and for analysis purposes, are conservative. Figure 9 illustrates the future year peak hour turning movement volumes with 2030 Long-Term conditions.

The campus' updated existing and proposed bed-mixes change the distribution of trips to the campus driveways compared to the January 2020 traffic impact analysis report.

An overarching goal for Master Plan is to enhance access to and from the campus via Steilacoom Blvd. SW while minimizing vehicle impacts to and from Sentinel Drive and 87th Ave. SW via Golf Course Road. To enhance, or focus, access to Steilacoom Blvd. SW, the initial Master Plan improvement is to close the South Street driveway.

Other options being considered include additional restrictions to the West Street and Golf Couse Road driveways. Implications of other access restrictions are not documented in the traffic analysis findings below and will be explored as the Master Plan is developed and phased improvements are implemented. For reference, the Sentinel Drive campus accesses generate about 14% of the campus' AM peak hour trips and about 6% of the

campus' PM peak hour trips. The Golf Course Road campus accesses generate about 2% of the campus' AM peak hour trips and about 8% of the campus' PM peak hour trips for the existing and future conditions.

Table 5: AM and PM Peak Hour Intersection LOS and Delay

Intersection	Control	2019 Existing		2024 In-Dev.		2030 In-Dev.		2030 Long-Term	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
AM Peak Hour									
Sentinel Dr. / West St.	WB Stop	C	19.1	C	19.1	C	19.1	C	19.8
Sentinel Dr. / South St.	WB Stop	C	22.1	C	18.8	C	18.8	-	-
Sentinel Dr. / Steilacoom Blvd.	Signal	C	28.1	C	29.8	C	31.7	C	31.5
Chapel Gate Dr. / Steilacoom Blvd.	SB Stop	C	15.2	C	15.9	C	16.7	C	15.9
Circle Dr. / Steilacoom Blvd.	Signal	A	5.8	A	5.9	A	5.9	A	5.8
CSTC Entrance / Steilacoom Blvd.	SB Stop	F	52.7	F	84.3	F	105.2	F	74.0
87th Ave. / Steilacoom Blvd.	Signal	B	16.6	B	17.1	B	18.0	B	17.8
87th Ave. / Oakridge Group Home	EB Stop	B	10.9	B	11.1	B	11.3	B	11.3
87th Ave. / Golf Course Rd.	EB Stop	B	10.9	B	11.1	B	11.3	B	11.3
Kids First Pl. / Golf Course Rd.	NB Stop	A	8.3	A	8.3	A	8.3	A	8.3
PM Peak Hour									
Sentinel Dr. / West St.	WB Stop	B	11.3	B	11.3	B	11.3	B	11.3
Sentinel Dr. / South St.	WB Stop	B	10.8	B	10.8	B	10.8	-	-
Sentinel Dr. / Steilacoom Blvd.	Signal	C	33.4	C	34.5	D	35.9	D	35.9
Chapel Gate Dr. / Steilacoom Blvd.	SB Stop	D	32.8	E	36.9	E	43.4	E	39.9
Circle Dr. / Steilacoom Blvd.	Signal	B	17.7	B	17.4	B	17.5	B	17.8
CSTC Entrance / Steilacoom Blvd.	SB Stop	E	39.9	F	54.8	F	66.6	F	58.9
87th Ave. / Steilacoom Blvd.	Signal	B	18.8	B	19.5	C	20.1	C	20.0
87th Ave. / Oakridge Group Home	EB Stop	A	9.9	B	10.1	B	10.2	B	10.2
87th Ave. / Golf Course Rd.	EB Stop	B	10.6	B	10.9	B	11.2	B	11.1
Kids First Pl. / Golf Course Rd.	NB Stop	A	8.4	A	8.4	A	8.4	A	8.4

The study intersections are forecast to operate at LOS D or better and satisfy the City of Lakewood's intersection LOS threshold, except the Chapel Gate Drive and CSTC Entrance driveways off Steilacoom Blvd. SW.

- Chapel Gate Drive is stop-controlled approaching Steilacoom Blvd. SW from the north. In the AM peak hour, the driveway approach is calculated to operate at LOS C, under the 2019 Existing, 2024 In-Development, 2030 In-Development, and 2030 Long-Term conditions. In the PM peak hour, the driveway approach is calculated to operate at LOS D, under the 2019 Existing condition, and LOS E, under the 2024 In-Development, 2030 In-Development, and 2030 Long-Term conditions.
- CSTC Entrance stop-controlled approaching Steilacoom Blvd. SW from the north. In the AM peak hour, the driveway is calculated to operate at LOS F, under the 2019 Existing condition, 2024 In-Development, 2030 In-Development, and 2030 Long-Term conditions. In the PM peak hour, the driveway approach is calculated to operate at LOS E, under the 2019 Existing condition, and LOS F, under the 2024 In-Development, 2030 In-Development, and 2030 Long-Term conditions.

With the Master Plan, new facilities and parking are proposed nearer to the east and west boundaries of the campus which is forecast to increase the attractiveness of the Chapel Gate Drive and new CTST Entrance driveway and decrease the attractiveness of the Circle Drive driveway. Currently, as a signalized access Circle Drive attracts most of the campuses traffic.

Improving access at the Chapel Gate Drive and CSTS Entrance driveways would attract more campus traffic to these driveways and divert traffic away from Circle Drive.

Improvement Draft Analysis

The following provides analyses of possible improvement options for consideration with the Master Plan.

With the major central campus building remaining, improvement to the existing internal roadways spacings near Circle Drive are limited. These is more land available near the Chapel Gate Drive and new CSTS Entrance driveways for internal roadway improvements. Ultimately, by making access to the campus via Circle Drive less attractive, it is understood that the traffic control signal at Circle Drive could be removed.

The January 2020 traffic impact analysis report included signals at Chapel Gate Drive and new CSTS Entrance for analysis purposes. Other access improvements would be considered, short of restricting access to these two new "primary" driveways.

Table 6 compares the 2030 Long-Term AM and PM peak hour traffic operations with:

- Current Steilacoom Blvd. SW access configurations with Chapel Gate Drive and CSTC Entrance stop-sign controlled, and Circle Drive signalized.
- Chapel Gate Drive and CSTC Entrance controlled by traffic signals and Circle Drive stop-sign controlled and restricted to right-in and right-out movements.
- Chapel Gate Drive and CSTC Entrance widened for separate left-lane and right-turn lanes outbound from the site and acceleration lanes on Steilacoom Blvd. SW to facilitate left turn egress and Circle Drive stop-sign controlled and restricted to right-in and right-out movements.

Table 6: 2030 Long-Term Peak Hour Intersection LOS and Delay Steilacoom Blvd. SW Access Enhancements

Intersection	Current Controls			New Signal Controls			Stop-Control and Accel.		
	Control	LOS	Delay	Control	LOS	Delay	Control	LOS	Delay
AM Peak Hour									
Chapel Gate Dr. / Steilacoom Blvd.	SB Stop	C	15.9	Signal	A	5.9	SB Stop	C	22.9
Circle Dr. / Steilacoom Blvd.	Signal	A	5.8	SB Stop	B	11.9	SB Stop	B	11.9
CSTC Entrance / Steilacoom Blvd.	SB Stop	F	74.0	Signal	A	5.7	SB Stop	E	42.6
PM Peak Hour									
Chapel Gate Dr. / Steilacoom Blvd.	SB Stop	E	39.9	Signal	A	6.0	SB Stop	D	29.0
Circle Dr. / Steilacoom Blvd.	Signal	B	17.8	SB Stop	B	12.3	SB Stop	B	12.3
CSTC Entrance / Steilacoom Blvd.	SB Stop	F	58.9	Signal	A	6.0	SB Stop	D	31.4

Signals at Chapel Gate and CSTC Entrance

Signalizing both Chapel Gate Drive and CSTC Entrance driveways enhances access to the campus. Delays experienced at both driveways would be significantly reduced and the improvement allows vehicles to exit the campus at a controlled intersection, which is safer than the current configurations at both driveways. With new signalized accesses, Circle Drive is recommended to be stop-sign control and restricted to right-in and right-out movements only. As a right-in and right-out driveway, it is assumed that half of the Circle Drive driveway's trips would shift to Chapel Gate Drive and CSTC Entrance.

Table 7 summarizes a travel time analysis on Steilacoom Blvd. SW with the current and new signal controls at the campus driveways. In the AM peak hour, the eastbound through traffic delay is forecast to increase by 4.5 seconds and the westbound through traffic delay is forecast to increase by 5.9 seconds. In the PM peak hour, the eastbound through traffic delay is forecast to decrease by 7.1 seconds and the westbound through traffic delay is forecast to decrease by 7.4 seconds.

Table 7: 2030 Long-Term Peak Hour Travel Time Estimate

Intersection	Current Controls			New Signal Controls		
	Control	Delay		Control	Delay	
AM Peak Hour		**WB Thru**	**EB Thru**		**WB Thru**	**EB Thru**
Sentinel Dr. / Steilacoom Blvd.	Signal	38.4	24.5	Signal	38.4	24.5
Chapel Gate Dr. / Steilacoom Blvd.	SB Stop	0.6	0.0	Signal	5.8	5.8
Circle Dr. / Steilacoom Blvd.	Signal	5.2	5.6	SB Stop	0.0	0.0
CSTC Entrance / Steilacoom Blvd.	SB Stop	0.5	0.0	Signal	5.0	5.7
87th Ave. / Steilacoom Blvd.	Signal	12.6	14.8	Signal	12.6	14.8
Sum of Through Delay	Total	57.3	44.9	Total	61.8	50.8
PM Peak Hour		**WB Thru**	**EB Thru**		**WB Thru**	**EB Thru**
Sentinel Dr. / Steilacoom Blvd.	Signal	46.7	31.5	Signal	46.7	30.9
Chapel Gate Dr. / Steilacoom Blvd.	SB Stop	0.0	0.0	Signal	5.6	5.9
Circle Dr. / Steilacoom Blvd.	Signal	18.5	18.5	SB Stop	0.0	0.0
CSTC Entrance / Steilacoom Blvd.	SB Stop	0.0	0.0	Signal	5.8	5.8
87th Ave. / Steilacoom Blvd.	Signal	15.3	18.5	Signal	15.3	18.5
Sum of Through Delay	Total	80.5	68.5	Total	73.4	61.1

Traffic control signals, or an equivalent improvement, have capacity to attract more campus traffic to the accesses Steilacoom Blvd. SW and reduce campus traffic impacts on Sentinel Way and 87th Ave. SW via Golf Course Road. Traffic signals will require a warrant justification to support their installation.

Widen Steilacoom Blvd. SW

Widening both Chapel Gate Road and CSTC Entrance driveways for separate left and right turn lanes exiting the site will allow right-turning vehicles to exit the site quicker; however, the outbound delay for left turning vehicles would not improve.

The non-signalized enhancement option above, shows the impacts on vehicle delay with widening on Steilacoom Blvd. SW for acceleration lanes at Chapel Gate Drive and CSTC Entrance and modifying Circle Drive with right-in and right-out stop-sign control.

Acceleration lanes allow vehicles to complete a two-stage left turn maneuver by navigating out of the campus across two westbound travel lanes and then using the acceleration lanes to merge into the eastbound traffic flow. With acceleration lanes, delays experienced at both driveways are reduced. The acceleration lanes also provide safer left turn maneuver than the current access controls at both driveways. This analysis shows that even with acceleration lanes the CSTC Entrance is still forecast to operate at LOS E in the AM peak hour.

Design of the acceleration lanes will require acquisition of right-of-way along Steilacoom Blvd. SW. Also, without other improvements to access control, it is unlikely that by simply adding the acceleration lanes would enhance access to the campus and draw more traffic away from Sentinel Drive and 87th Ave. SW via Golf Course Road.

Left Turn Lane Impacts

City staff recently commented on vehicle queue impacts on Steilacoom Blvd. SW approaching Sentinel Drive from the east and on 87th Ave. SW approaching Steilacoom Blvd. SW from the north.

The westbound left turn lane on Steilacoom Blvd. SW at Sentinel Drive is 200 feet with storage for about 8 vehicles. The 2019 Existing 95th-percentile queue 11.8 vehicles (AM peak hour) and 11.5 vehicles (PM peak hour) long. Under 2019 Existing conditions the peak hour queue exceeds the left turn storage by about 4 vehicle lengths, or roughly 100 feet. The 2030 Long-Term 95th-percentile queue 14.9 vehicles (AM peak hour) and 13.7 vehicles (PM peak hour) long. Under 2030 Long-Term conditions the peak hour queue exceeds the left turn storage by up to 7 vehicle lengths, or roughly 175 feet. The intersection is forecast to operate within the City of Lakewood's LOS standards and widening to expand vehicle storage area will need occur in cooperation with the City of Lakewood since right-of-way acquisition is likely.

The southbound left turn lane on 87th Ave. SW at Steilacoom Blvd. SW is 125 feet with storage for about 5 vehicles. The 2019 Existing 95th-percentile queue 5.4 vehicles (AM peak hour) and 3.9 vehicles (PM peak hour) long. Under 2019 Existing conditions the peak hour queue exceeds the left turn storage by about half a vehicle length, or roughly 10 feet. The 2030 Long-Term 95th-percentile queue 6.5 vehicles (AM peak hour) and 4.7 vehicles (PM peak hour) long. Under 2030 Long-Term conditions the peak hour queue exceeds the left turn storage by about 1.5 vehicle lengths, or roughly 40 feet. The intersection is forecast to operate within the City of Lakewood's LOS standards and widening to expand vehicle storage area may need to occur in cooperation with the City of Lakewood if right-of-way acquisition is required.

Conclusions

This supplemental analysis updates the trip generation forecast and campus trip distribution based on the updated bed mix and development areas from the January 2020 Traffic Impact Analysis report.

The updated trip forecasts are:

	Existing	**In-Development**	**Near-Term (1-5 yrs.)**	**Mid-Term (6-10 yrs.)**	**Long-Term (beyond 10 yrs.)**
AM Peak Hour	677 trips, 455 in and 222 out	768 trips, 516 in and 252 out	725 trips, 487 in and 238 out	587 trips, 395 in and 193 out	639 trips, 430 in and 210 out
PM Peak Hour	366 trips, 60 in and 306 out	415 trips, 68 in and 347 out	393 trips, 64 in and 328 out	318 trips, 52 in and 266 out	345 trips, 56 in and 289 out
Weekday Daily	6,046 trips, 50% in and 50% out	6,860 trips, 50% in and 50% out	6,474 trips, 50% in and 50% out	5,246 trips, 50% in and 50% out	5,709 trips, 50% in and 50% out

The analysis peak hours represent the times when traffic on the adjacent roadways are highest.

The In-Development conditions represent development currently allowed on the campus. The Near-Term and Mid-Term conditions represent development proposed allowed under the proposed Master Plan. The Long-Term conditions represent future development potential, beyond the Master Plan horizon. For this analysis, the In-Development conditions represent a future baseline where the proposed Master Plan is not implemented,

and the Long-Term conditions represent the future Master Plan build-out. Both conditions ensure a conservative analysis of traffic impacts.

Traffic analysis of 2019 Existing, 2024 In-Development, 2030 In-Development and 2030 Long-Term AM and PM peak hour traffic conditions shows that all of the study intersections operate at LOS D or better except the site accesses at Chapel Gate Drive and CSTC Entrance on Steilacoom Blvd. SW. Both accesses are forecast to operate at LOS E or LOS F now and in the future.

Improvements to campus accesses are recommended to enhance access at Steilacoom Blvd. SW and reduce campus traffic impacts to Sentinel Drive and 87th Ave. SW via Golf Course Road. With the Master Plan, the existing South Street driveway is proposed to be removed.

Other access restrictions on Sentinel Drive and on Golf Course Road, may be explored as improvements are allowed and completed on Steilacoom Blvd. SW.

With the proposed Master Plan, new facilities and parking are proposed at the east and west edges of the campus, which would allow traffic to shift from Circle Drive to Chapel Gate Drive and CSTC Entrance driveways.

Driveway improvements explored above include signals at Chapel Gate Drive and CSTC Entrance, widening Steilacoom Blvd. SW for acceleration lanes, and removing the signal at Circle Drive and replacing it with stop-control and right-in and right-out restrictions. Other options are open for consideration and we look forward to working with city staff to address their recommendations under the constraints on the Master Plan proposal.

If you have any questions, please feel free to contact me at your convenience.

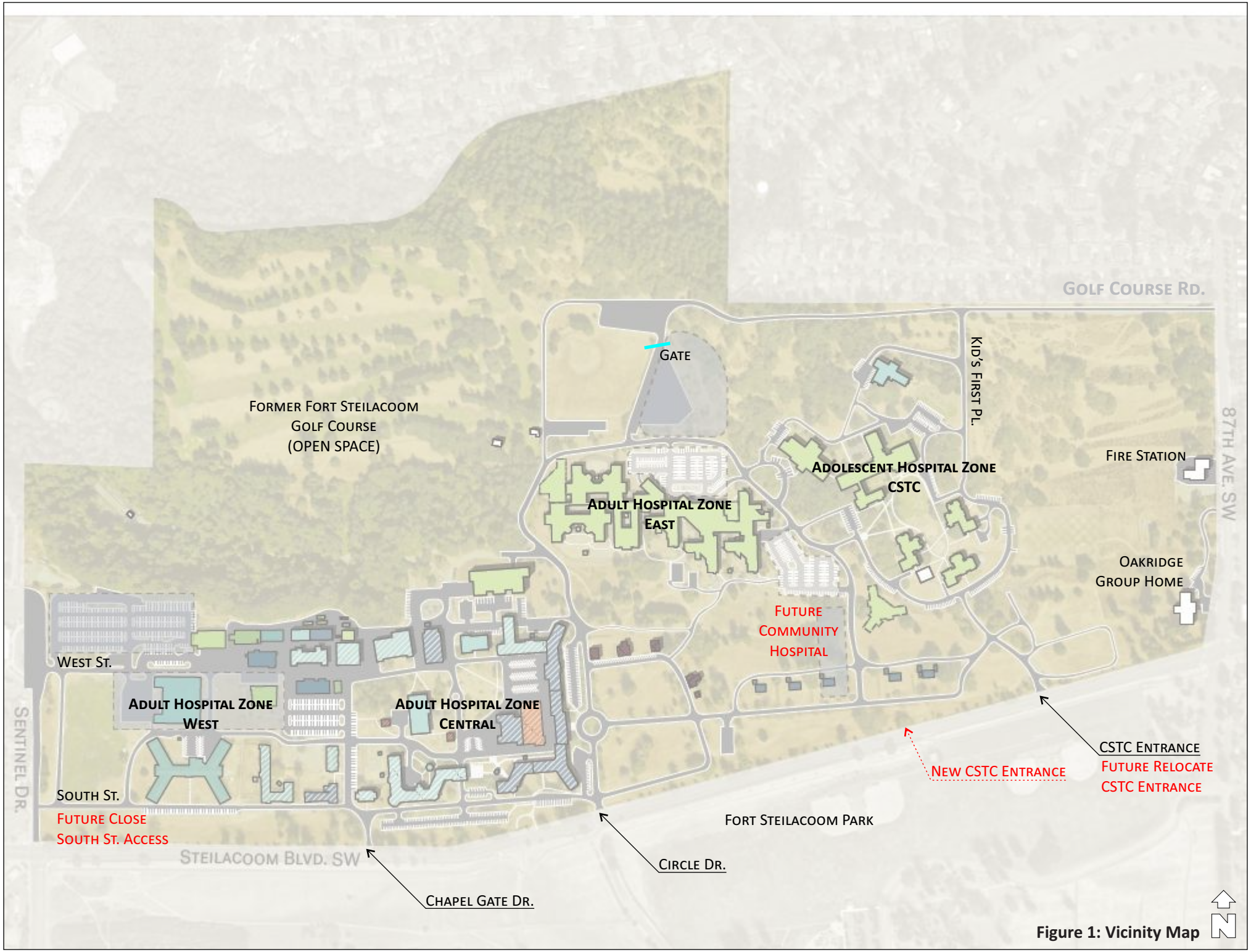


Figure 1: Vicinity Map

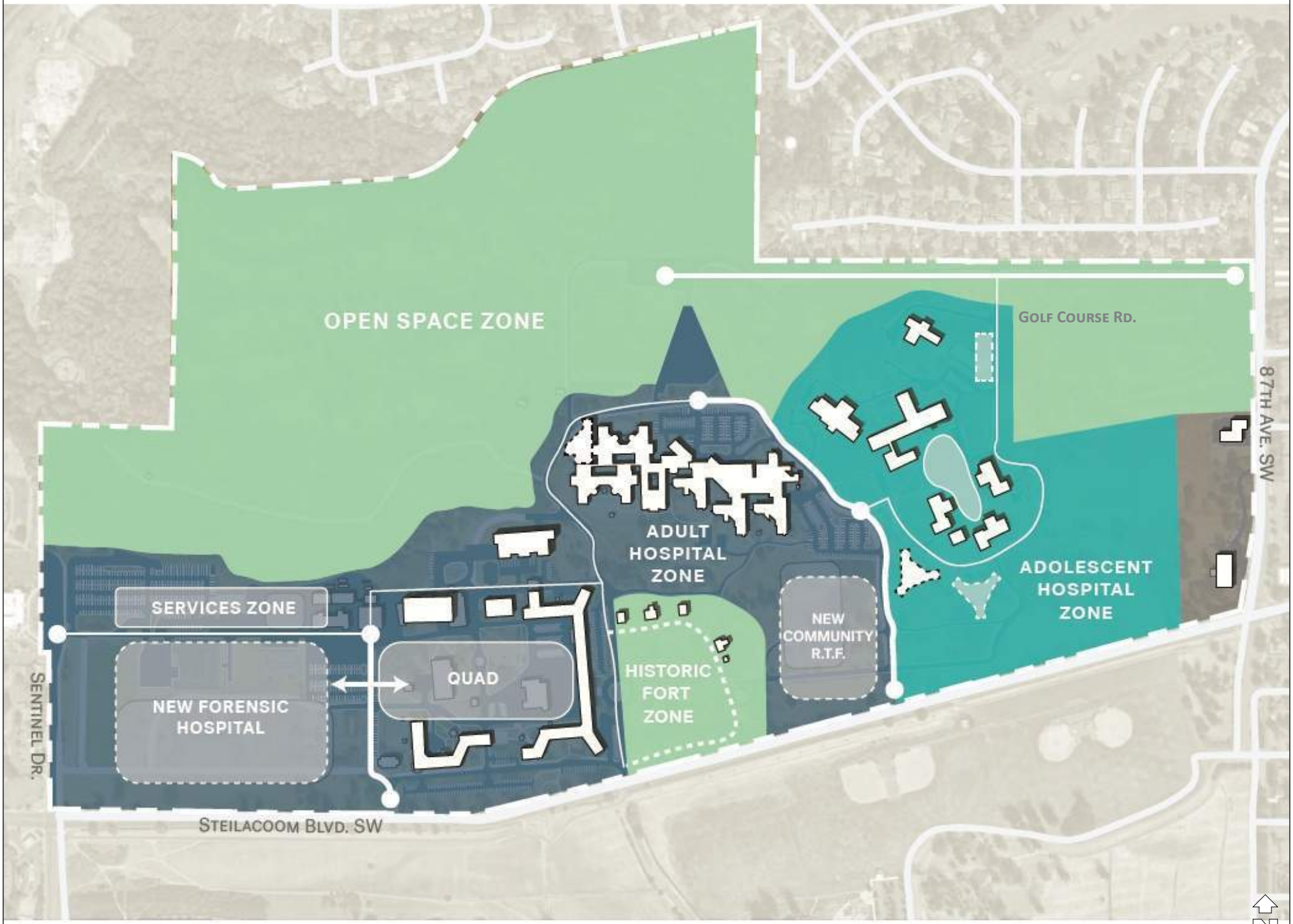


Figure 2: Master Plan Site Plan

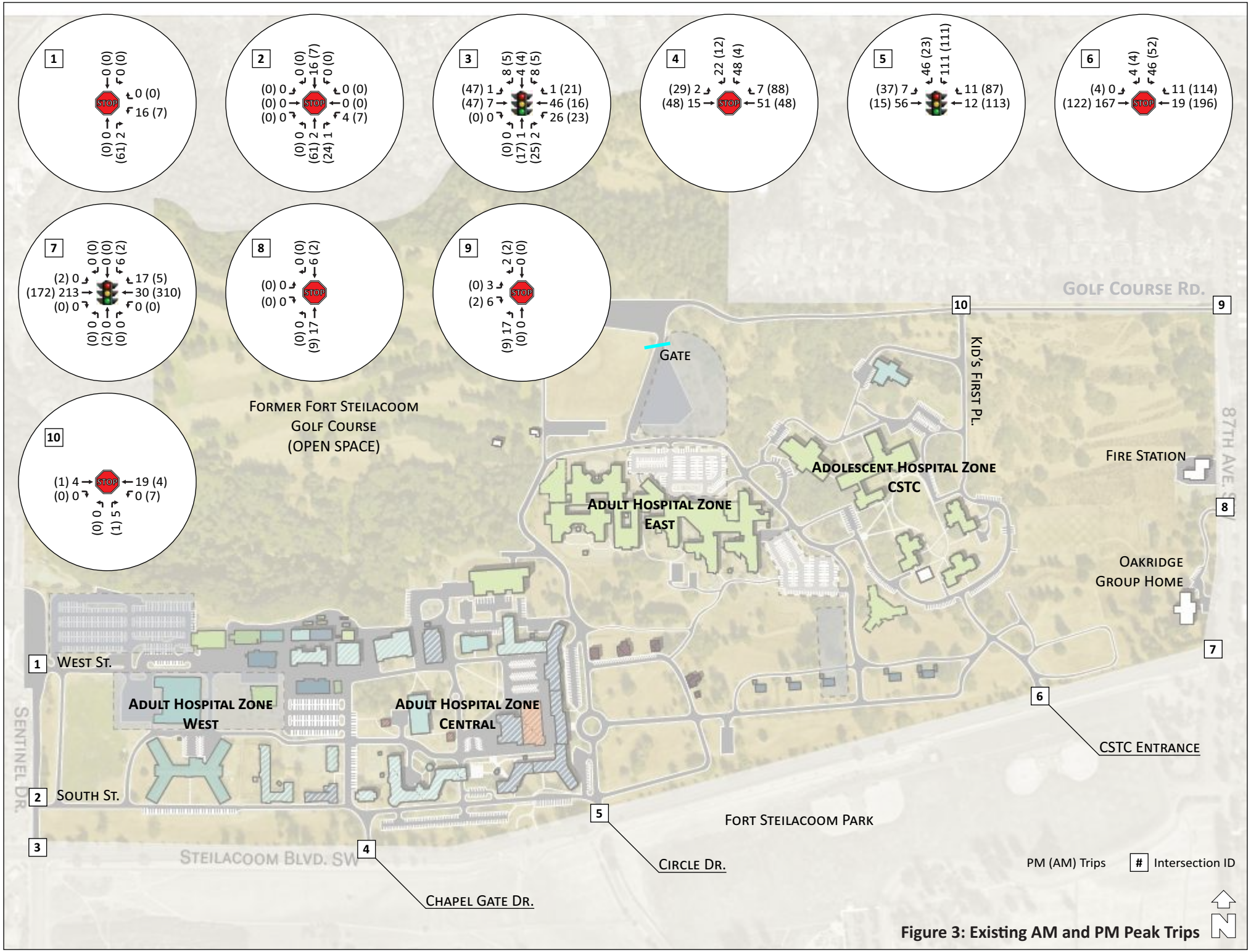


Figure 3: Existing AM and PM Peak Trips

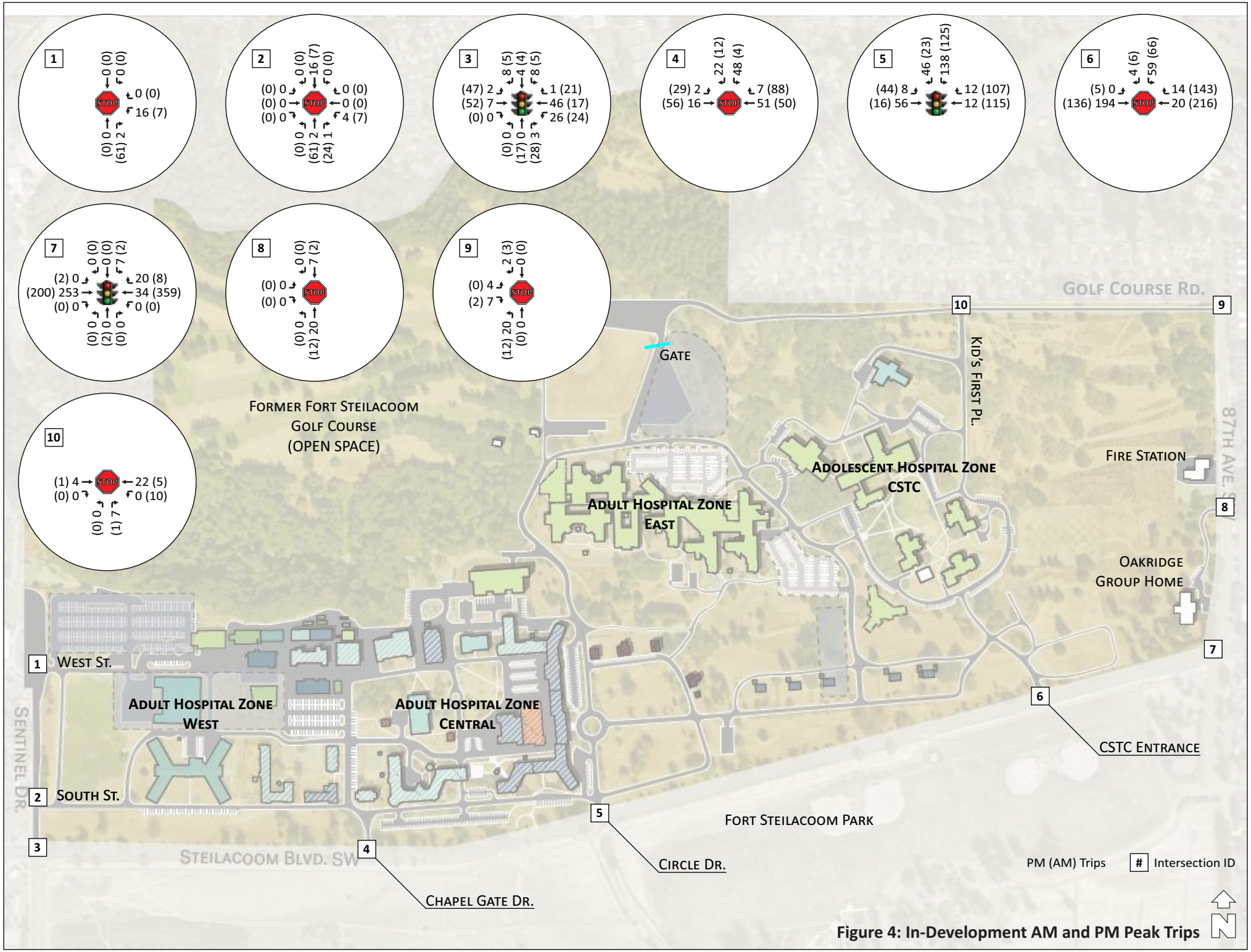


Figure 4: In-Development AM and PM Peak Trips

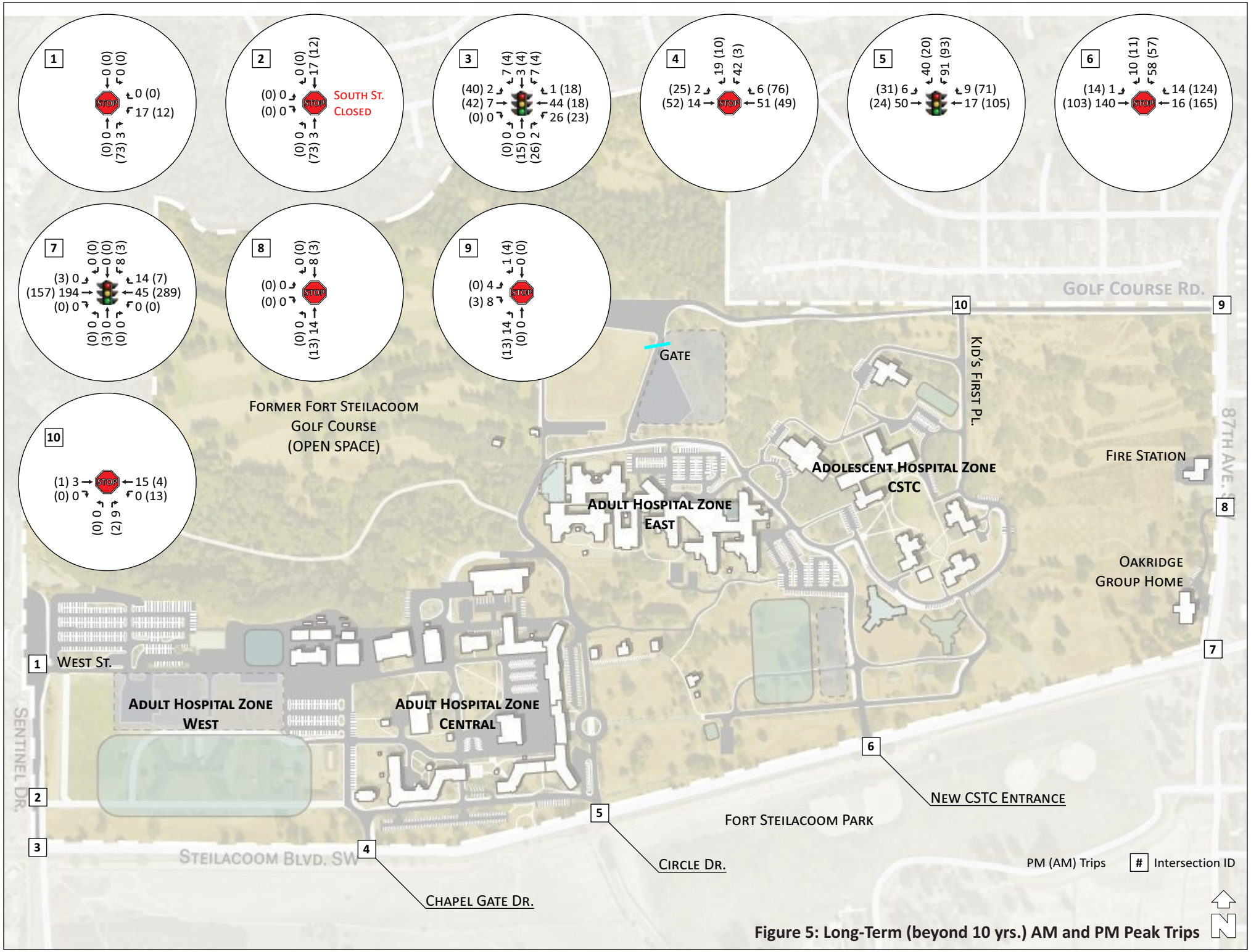


Figure 5: Long-Term (beyond 10 yrs.) AM and PM Peak Trips

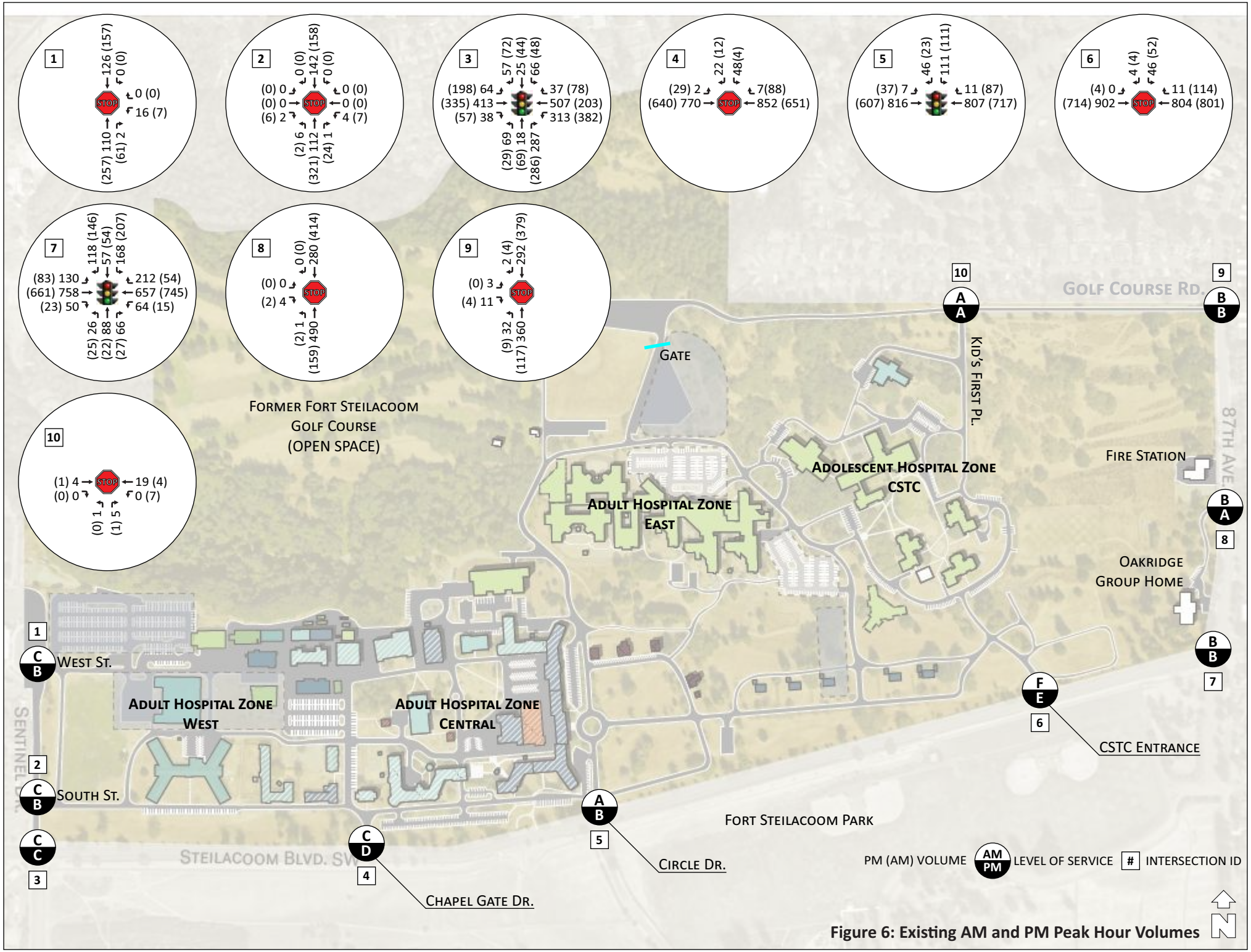


Figure 6: Existing AM and PM Peak Hour Volumes

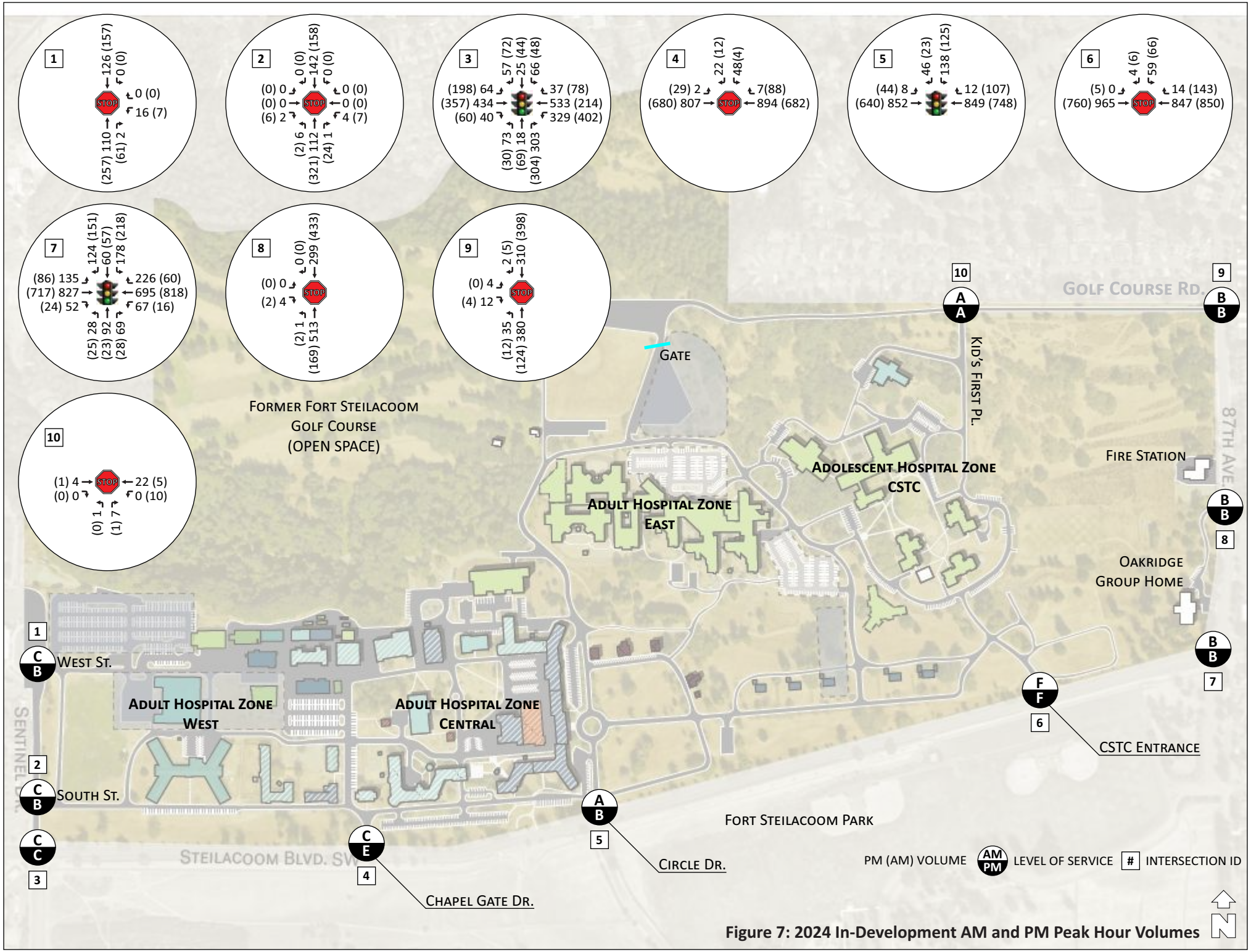


Figure 7: 2024 In-Development AM and PM Peak Hour Volumes

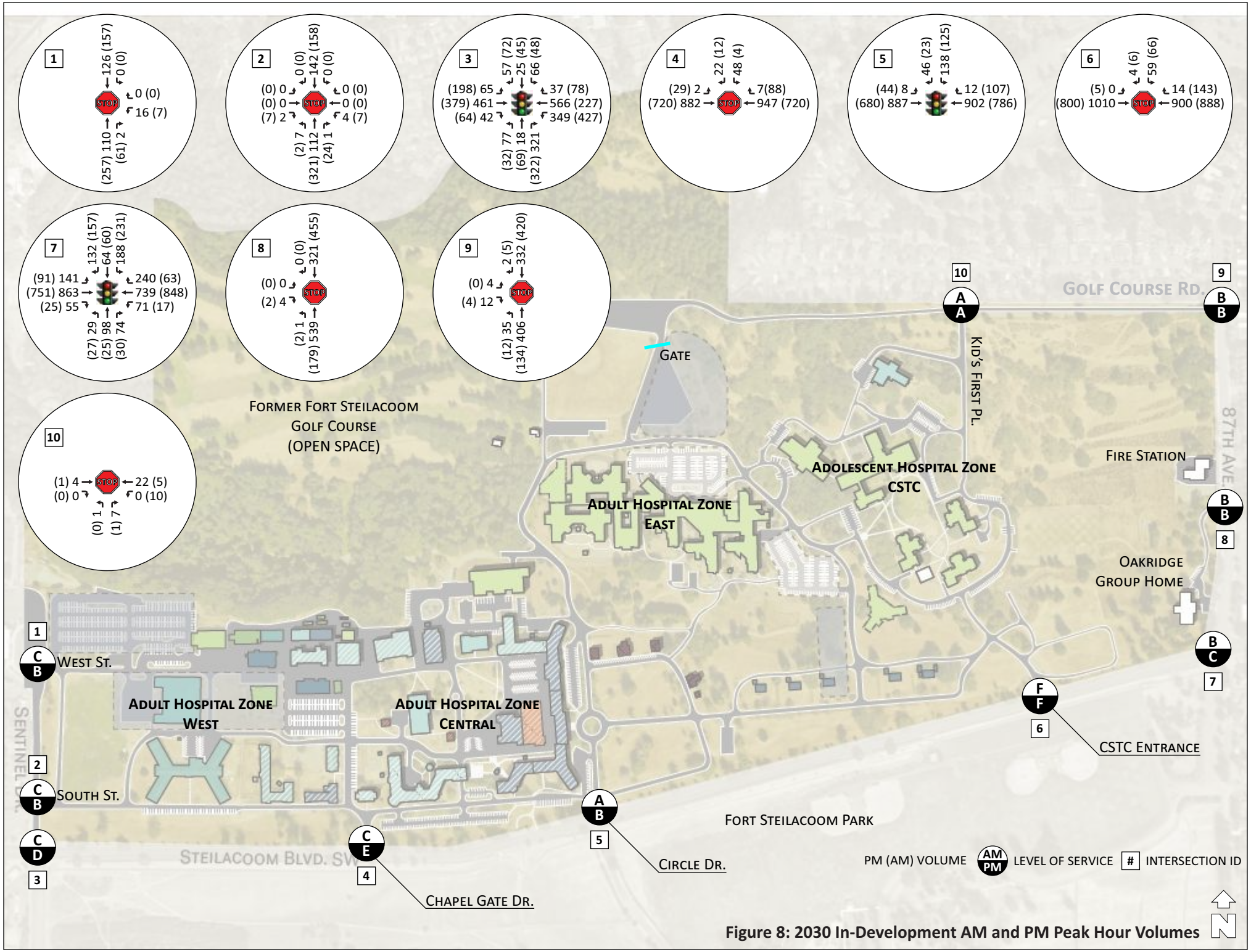


Figure 8: 2030 In-Development AM and PM Peak Hour Volumes

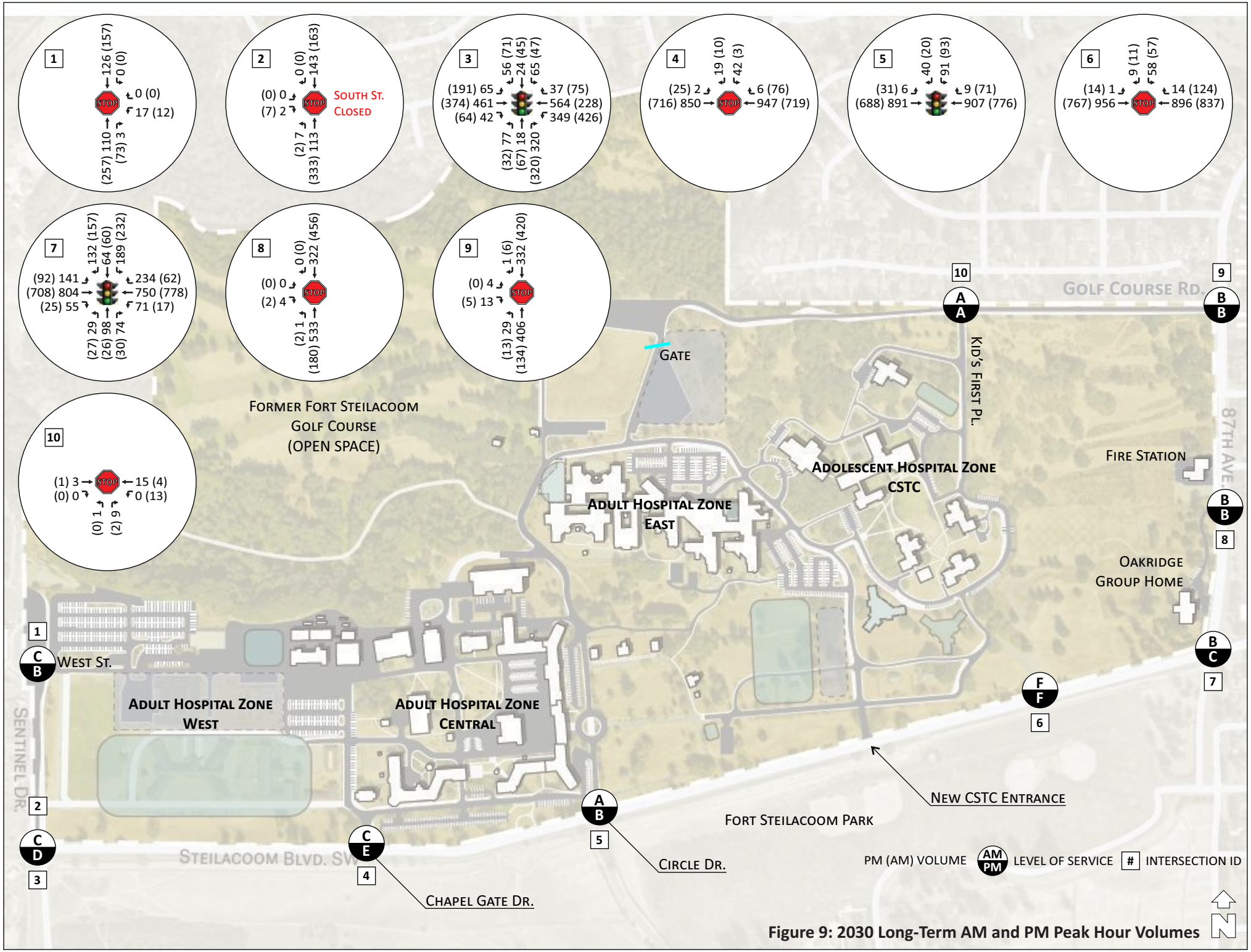


Figure 9: 2030 Long-Term AM and PM Peak Hour Volumes

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	0	257	61	0	157
Future Vol, veh/h	7	0	257	61	0	157
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	33	0	2	2	0	0
Mvmt Flow	13	0	476	113	0	291

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	874	583	0	0	639	0
Stage 1	583	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.73	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	283	516	-	-	955	-
Stage 1	502	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	269	491	-	-	910	-
Mov Cap-2 Maneuver	269	-	-	-	-	-
Stage 1	478	-	-	-	-	-
Stage 2	693	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	269	910	-
HCM Lane V/C Ratio	-	-	0.048	-	-
HCM Control Delay (s)	-	-	19.1	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	6	7	0	0	2	321	24	0	158	0
Future Vol, veh/h	0	0	6	7	0	0	2	321	24	0	158	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	50	50	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	54	92	54	92	54	54	54	54	92
Heavy Vehicles, %	2	2	2	0	2	0	2	2	0	0	33	2
Mvmt Flow	0	0	7	13	0	0	2	594	44	0	293	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	913	985	293	967	963	666	293	0	0	688	0	0
Stage 1	293	293	-	670	670	-	-	-	-	-	-	-
Stage 2	620	692	-	297	293	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	254	248	746	236	256	463	1269	-	-	916	-	-
Stage 1	715	670	-	450	455	-	-	-	-	-	-	-
Stage 2	476	445	-	716	670	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	253	236	746	223	243	441	1269	-	-	872	-	-
Mov Cap-2 Maneuver	253	236	-	223	243	-	-	-	-	-	-	-
Stage 1	714	670	-	428	432	-	-	-	-	-	-	-
Stage 2	475	423	-	710	670	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	22.1	0	0
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1269	-	-	746	223	872	-	-
HCM Lane V/C Ratio	0.002	-	-	0.009	0.058	-	-	-
HCM Control Delay (s)	7.8	0	-	9.9	22.1	0	-	-
HCM Lane LOS	A	A	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	198	335	57	382	203	78	29	69	286	48	44	72
Future Volume (veh/h)	198	335	57	382	203	78	29	69	286	48	44	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1767	1767	1767
Adj Flow Rate, veh/h	233	394	67	449	239	92	34	81	336	56	52	85
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	9	9	9
Cap, veh/h	573	908	153	585	965	361	345	363	599	217	77	125
Arrive On Green	0.11	0.30	0.30	0.19	0.38	0.38	0.19	0.19	0.19	0.13	0.13	0.13
Sat Flow, veh/h	1767	3009	507	1781	2529	946	1781	1870	1543	1682	593	969
Grp Volume(v), veh/h	233	229	232	449	166	165	34	81	336	56	0	137
Grp Sat Flow(s),veh/h/ln	1767	1763	1753	1781	1777	1699	1781	1870	1543	1682	0	1562
Q Serve(g_s), s	9.6	11.2	11.4	17.8	6.8	7.2	1.7	3.9	18.5	3.2	0.0	9.0
Cycle Q Clear(g_c), s	9.6	11.2	11.4	17.8	6.8	7.2	1.7	3.9	18.5	3.2	0.0	9.0
Prop In Lane	1.00		0.29	1.00		0.56	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	573	532	529	585	678	648	345	363	599	217	0	202
V/C Ratio(X)	0.41	0.43	0.44	0.77	0.24	0.25	0.10	0.22	0.56	0.26	0.00	0.68
Avail Cap(c_a), veh/h	627	532	529	729	678	648	365	383	615	423	0	393
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.5	30.1	30.2	18.9	22.7	22.8	35.6	36.5	26.2	42.1	0.0	44.6
Incr Delay (d2), s/veh	0.2	2.5	2.6	2.9	0.9	0.9	0.0	0.1	0.6	0.2	0.0	1.5
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(95%),veh/ln	7.0	8.7	8.8	11.8	5.3	5.4	1.3	3.2	10.9	2.5	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.7	32.6	32.8	21.8	23.5	23.7	35.6	36.6	26.8	42.4	0.0	46.1
LnGrp LOS	C	C	C	C	C	C	D	D	C	D	A	D
Approach Vol, veh/h		694			780			451			193	
Approach Delay, s/veh		29.0			22.6			29.2			45.0	
Approach LOS		C			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		25.8	25.3	37.4		18.9	16.7	46.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	29.0	27.0		27.0	15.0	41.0				
Max Q Clear Time (g_c+I1), s		20.5	19.8	13.4		11.0	11.6	9.2				
Green Ext Time (p_c), s		0.2	0.5	1.5		0.5	0.1	1.2				

Intersection Summary	
HCM 6th Ctrl Delay	28.1
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	640	651	88	4	12
Future Vol, veh/h	29	640	651	88	4	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	8	8
Mvmt Flow	31	681	693	94	4	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	787	0	-	0	1143	394
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	403	-
Critical Hdwy	4.14	-	-	-	6.96	7.06
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	2.22	-	-	-	3.58	3.38
Pot Cap-1 Maneuver	828	-	-	-	185	588
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	626	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	828	-	-	-	174	588
Mov Cap-2 Maneuver	-	-	-	-	174	-
Stage 1	-	-	-	-	392	-
Stage 2	-	-	-	-	626	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	828	-	-	-	369
HCM Lane V/C Ratio	0.037	-	-	-	0.046
HCM Control Delay (s)	9.5	0.3	-	-	15.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	607	717	87	111	23
Future Volume (veh/h)	37	607	717	87	111	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	41	674	797	97	123	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	192	1480	1454	177	282	60
Arrive On Green	0.46	0.46	0.46	0.46	0.19	0.19
Sat Flow, veh/h	80	3331	3283	388	1453	307
Grp Volume(v), veh/h	372	343	444	450	150	0
Grp Sat Flow(s),veh/h/ln	1709	1617	1777	1801	1772	0
Q Serve(g_s), s	0.0	3.8	4.7	4.7	1.9	0.0
Cycle Q Clear(g_c), s	3.5	3.8	4.7	4.7	1.9	0.0
Prop In Lane	0.11			0.22	0.82	0.17
Lane Grp Cap(c), veh/h	934	737	810	821	344	0
V/C Ratio(X)	0.40	0.47	0.55	0.55	0.44	0.00
Avail Cap(c_a), veh/h	1576	1414	1554	1575	1343	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.8	4.8	5.1	5.1	9.1	0.0
Incr Delay (d2), s/veh	0.3	0.5	0.6	0.6	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	0.8	1.1	1.1	1.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.0	5.3	5.7	5.7	10.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		715	894		150	
Approach Delay, s/veh		5.2	5.7		10.0	
Approach LOS		A	A		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			16.2		9.5	16.2
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			22.5		19.5	22.5
Max Q Clear Time (g_c+I1), s			5.8		3.9	6.7
Green Ext Time (p_c), s			4.2		0.3	5.1

Intersection Summary						
HCM 6th Ctrl Delay			5.8			
HCM 6th LOS			A			

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	714	801	114	52	4
Future Vol, veh/h	4	714	801	114	52	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	5	821	921	131	60	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1052	0	-	0	1408	526
Stage 1	-	-	-	-	987	-
Stage 2	-	-	-	-	421	-
Critical Hdwy	4.14	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.22	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	657	-	-	-	132	502
Stage 1	-	-	-	-	326	-
Stage 2	-	-	-	-	636	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	657	-	-	-	130	502
Mov Cap-2 Maneuver	-	-	-	-	130	-
Stage 1	-	-	-	-	321	-
Stage 2	-	-	-	-	636	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	52.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	657	-	-	-	137
HCM Lane V/C Ratio	0.007	-	-	-	0.47
HCM Control Delay (s)	10.5	0.1	-	-	52.7
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	661	23	15	745	54	25	22	27	207	54	146
Future Volume (veh/h)	83	661	23	15	745	54	25	22	27	207	54	146
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		0.98	0.98		0.98
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	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	90	718	25	16	810	0	27	24	29	225	59	159
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	115	1700	59	35	1563		201	214	186	387	308	269
Arrive On Green	0.06	0.49	0.49	0.02	0.44	0.00	0.03	0.12	0.12	0.08	0.17	0.17
Sat Flow, veh/h	1781	3503	122	1781	3647	0	1795	1791	1561	1795	1791	1563
Grp Volume(v), veh/h	90	364	379	16	810	0	27	24	29	225	59	159
Grp Sat Flow(s),veh/h/ln	1781	1777	1848	1781	1777	0	1795	1791	1561	1795	1791	1563
Q Serve(g_s), s	3.1	8.1	8.1	0.5	10.1	0.0	0.0	0.7	1.0	0.0	1.7	5.8
Cycle Q Clear(g_c), s	3.1	8.1	8.1	0.5	10.1	0.0	0.0	0.7	1.0	0.0	1.7	5.8
Prop In Lane	1.00		0.07	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	115	862	897	35	1563		201	214	186	387	308	269
V/C Ratio(X)	0.78	0.42	0.42	0.46	0.52		0.13	0.11	0.16	0.58	0.19	0.59
Avail Cap(c_a), veh/h	189	862	897	145	1563		293	829	723	388	832	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	10.2	10.2	29.8	12.5	0.0	28.0	24.1	24.2	24.3	21.8	23.4
Incr Delay (d2), s/veh	4.3	1.5	1.5	3.5	1.2	0.0	0.1	0.1	0.1	1.5	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.4	5.3	5.5	0.5	6.6	0.0	0.7	0.5	0.7	5.4	1.3	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.5	11.7	11.7	33.3	13.7	0.0	28.1	24.2	24.4	25.8	21.9	24.2
LnGrp LOS	C	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		833			826	A		80			443	
Approach Delay, s/veh		14.0			14.1			25.6			24.7	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	11.8	5.7	34.3	6.3	15.1	8.5	31.5
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	5.1	28.4	5.0	28.5	5.0	28.5	6.5	27.0
Max Q Clear Time (g_c+I1), s	2.0	3.0	2.5	10.1	2.0	7.8	5.1	12.1
Green Ext Time (p_c), s	0.1	0.1	0.0	2.7	0.0	0.8	0.0	3.3

Intersection Summary	
HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	159	414	0
Future Vol, veh/h	0	2	2	159	414	0
Conflicting Peds, #/hr	0	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	4	1	0
Mvmt Flow	0	2	2	169	440	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	619	447	446	0	-	0
Stage 1	446	-	-	-	-	-
Stage 2	173	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	455	616	1125	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	449	612	1119	-	-	-
Mov Cap-2 Maneuver	530	-	-	-	-	-
Stage 1	644	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1119	-	612	-	-
HCM Lane V/C Ratio	0.002	-	0.003	-	-
HCM Control Delay (s)	8.2	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	9	117	379	4
Future Vol, veh/h	0	4	9	117	379	4
Conflicting Peds, #/hr	0	1	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	10	133	431	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	592	440	441	0	-	0
Stage 1	439	-	-	-	-	-
Stage 2	153	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	469	617	1119	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	460	613	1114	-	-	-
Mov Cap-2 Maneuver	534	-	-	-	-	-
Stage 1	640	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1114	-	613	-	-
HCM Lane V/C Ratio	0.009	-	0.007	-	-
HCM Control Delay (s)	8.3	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	0	7	4	0	1
Future Vol, veh/h	1	0	7	4	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	17	0	0	0	0	2
Mvmt Flow	2	0	13	7	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2	0	35	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	33	-
Critical Hdwy	-	-	4.1	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1634	-	983	1082
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	995	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1634	-	975	1082
Mov Cap-2 Maneuver	-	-	-	-	975	-
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	987	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.6	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1082	-	-	1634	-
HCM Lane V/C Ratio	0.002	-	-	0.008	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	0	110	2	0	126
Future Vol, veh/h	16	0	110	2	0	126
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	25	0	175	3	0	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	397	197	0	0	198	0
Stage 1	197	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	612	849	-	-	1387	-
Stage 1	841	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	600	833	-	-	1361	-
Mov Cap-2 Maneuver	600	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	600	1361	-
HCM Lane V/C Ratio	-	-	0.042	-	-
HCM Control Delay (s)	-	-	11.3	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	0	112	1	0	142
Future Vol, veh/h	4	0	112	1	0	142
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	151	1	0	192

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	364	172	0	0	172	0
Stage 1	172	-	-	-	-	-
Stage 2	192	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	639	877	-	-	1417	-
Stage 1	863	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	627	860	-	-	1390	-
Mov Cap-2 Maneuver	627	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	845	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	627	1390	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	-	-	10.8	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	413	38	313	507	37	69	18	287	66	25	57
Future Volume (veh/h)	64	413	38	313	507	37	69	18	287	66	25	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	69	444	41	337	545	40	74	19	309	71	27	61
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	330	808	74	454	1206	88	630	662	795	139	39	89
Arrive On Green	0.04	0.24	0.24	0.15	0.36	0.36	0.35	0.35	0.35	0.08	0.08	0.08
Sat Flow, veh/h	1795	3310	304	1795	3382	248	1795	1885	1567	1795	506	1143
Grp Volume(v), veh/h	69	239	246	337	288	297	74	19	309	71	0	88
Grp Sat Flow(s),veh/h/ln	1795	1791	1823	1795	1791	1839	1795	1885	1567	1795	0	1649
Q Serve(g_s), s	3.3	13.4	13.5	15.6	14.2	14.3	3.2	0.8	14.0	4.4	0.0	6.0
Cycle Q Clear(g_c), s	3.3	13.4	13.5	15.6	14.2	14.3	3.2	0.8	14.0	4.4	0.0	6.0
Prop In Lane	1.00		0.17	1.00		0.13	1.00		1.00	1.00		0.69
Lane Grp Cap(c), veh/h	330	437	445	454	639	655	630	662	795	139	0	128
V/C Ratio(X)	0.21	0.55	0.55	0.74	0.45	0.45	0.12	0.03	0.39	0.51	0.00	0.69
Avail Cap(c_a), veh/h	334	437	445	475	639	655	630	662	795	422	0	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.6	37.9	38.0	25.9	28.4	28.4	25.2	24.5	17.6	50.9	0.0	51.7
Incr Delay (d2), s/veh	0.1	4.9	4.9	5.1	2.3	2.3	0.4	0.1	1.4	1.1	0.0	2.5
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(95%),veh/ln	2.6	10.6	10.8	11.5	10.5	10.8	2.6	0.6	8.9	3.6	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.7	42.8	42.9	31.0	30.7	30.6	25.6	24.5	19.0	52.0	0.0	54.1
LnGrp LOS	C	D	D	C	C	C	C	C	B	D	A	D
Approach Vol, veh/h		554			922			402			159	
Approach Delay, s/veh		41.3			30.8			20.5			53.2	
Approach LOS		D			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		45.4	22.6	33.1		13.9	9.7	46.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	19.0	27.0		27.0	5.0	41.0				
Max Q Clear Time (g_c+I1), s		16.0	17.6	15.5		8.0	5.3	16.3				
Green Ext Time (p_c), s		0.4	0.1	1.4		0.4	0.0	2.2				

Intersection Summary												
HCM 6th Ctrl Delay			33.4									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	770	852	7	48	22
Future Vol, veh/h	2	770	852	7	48	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	2	802	888	7	50	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	895	0	-	0	1297	448
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	760	-	-	-	156	564
Stage 1	-	-	-	-	366	-
Stage 2	-	-	-	-	648	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	760	-	-	-	155	564
Mov Cap-2 Maneuver	-	-	-	-	155	-
Stage 1	-	-	-	-	364	-
Stage 2	-	-	-	-	648	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	32.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	760	-	-	-	201
HCM Lane V/C Ratio	0.003	-	-	-	0.363
HCM Control Delay (s)	9.8	0	-	-	32.8
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	816	807	11	111	46
Future Volume (veh/h)	7	816	807	11	111	46
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	7	859	849	12	117	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	66	1160	1201	17	629	258
Arrive On Green	0.33	0.33	0.33	0.33	0.51	0.51
Sat Flow, veh/h	8	3579	3710	51	1227	503
Grp Volume(v), veh/h	463	403	420	441	166	0
Grp Sat Flow(s),veh/h/ln	1871	1630	1791	1876	1741	0
Q Serve(g_s), s	0.0	12.7	11.9	11.9	3.0	0.0
Cycle Q Clear(g_c), s	12.6	12.7	11.9	11.9	3.0	0.0
Prop In Lane	0.02			0.03	0.70	0.29
Lane Grp Cap(c), veh/h	684	541	595	623	893	0
V/C Ratio(X)	0.68	0.74	0.71	0.71	0.19	0.00
Avail Cap(c_a), veh/h	976	801	880	922	893	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.2	17.2	16.9	16.9	7.6	0.0
Incr Delay (d2), s/veh	1.2	2.1	1.6	1.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.6	7.9	7.9	8.2	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.3	19.3	18.5	18.4	8.1	0.0
LnGrp LOS	B	B	B	B	A	A
Approach Vol, veh/h		866	861		166	
Approach Delay, s/veh		18.8	18.4		8.1	
Approach LOS		B	B		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			23.8		34.2	23.8
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			28.5		20.5	28.5
Max Q Clear Time (g_c+I1), s			14.7		5.0	13.9
Green Ext Time (p_c), s			4.5		0.4	4.6

Intersection Summary		
HCM 6th Ctrl Delay	17.7	
HCM 6th LOS	B	

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	902	804	11	46	4
Future Vol, veh/h	0	902	804	11	46	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	960	855	12	49	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	867	0	-	0	1341	434
Stage 1	-	-	-	-	861	-
Stage 2	-	-	-	-	480	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	779	-	-	-	146	576
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	594	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	779	-	-	-	146	576
Mov Cap-2 Maneuver	-	-	-	-	146	-
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	594	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	39.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	779	-	-	-	155
HCM Lane V/C Ratio	-	-	-	-	0.343
HCM Control Delay (s)	0	-	-	-	39.9
HCM Lane LOS	A	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	758	50	64	657	212	26	88	66	168	57	118
Future Volume (veh/h)	130	758	50	64	657	212	26	88	66	168	57	118
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	0.99		0.95	0.99		0.97
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	1885	1885	1885	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	135	790	52	67	684	0	27	92	69	175	59	123
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	171	1567	103	97	1498		295	261	175	353	319	277
Arrive On Green	0.10	0.46	0.46	0.05	0.42	0.00	0.03	0.13	0.13	0.08	0.18	0.18
Sat Flow, veh/h	1795	3411	224	1795	3676	0	1810	2025	1359	1795	1791	1555
Grp Volume(v), veh/h	135	415	427	67	684	0	27	81	80	175	59	123
Grp Sat Flow(s),veh/h/ln	1795	1791	1844	1795	1791	0	1810	1805	1578	1795	1791	1555
Q Serve(g_s), s	4.7	10.5	10.5	2.4	8.9	0.0	0.8	2.6	3.0	5.1	1.8	4.6
Cycle Q Clear(g_c), s	4.7	10.5	10.5	2.4	8.9	0.0	0.8	2.6	3.0	5.1	1.8	4.6
Prop In Lane	1.00		0.12	1.00		0.00	1.00		0.86	1.00		1.00
Lane Grp Cap(c), veh/h	171	823	847	97	1498		295	232	203	353	319	277
V/C Ratio(X)	0.79	0.50	0.50	0.69	0.46		0.09	0.35	0.39	0.50	0.19	0.44
Avail Cap(c_a), veh/h	214	823	847	181	1498		381	760	665	353	757	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	12.3	12.3	30.0	13.5	0.0	23.2	25.7	25.8	22.2	22.6	23.7
Incr Delay (d2), s/veh	11.2	2.2	2.1	3.2	1.0	0.0	0.0	0.3	0.5	0.4	0.1	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(95%),veh/ln	4.4	7.3	7.5	1.9	6.0	0.0	0.6	2.0	2.0	3.9	1.3	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.7	14.5	14.4	33.2	14.5	0.0	23.3	26.0	26.3	22.6	22.7	24.1
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		977			751	A		188			357	
Approach Delay, s/veh		17.9			16.2			25.7			23.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	12.8	8.0	34.2	6.4	16.0	10.7	31.5
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	5.1	27.2	6.5	28.2	5.0	27.3	7.7	27.0
Max Q Clear Time (g_c+I1), s	7.1	5.0	4.4	12.5	2.8	6.6	6.7	10.9
Green Ext Time (p_c), s	0.0	0.6	0.0	3.1	0.0	0.7	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	18.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	490	280	0
Future Vol, veh/h	0	4	1	490	280	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	4	1	533	304	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	842	307	307	0	-	0
Stage 1	307	-	-	-	-	-
Stage 2	535	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	337	738	1265	-	-	-
Stage 1	751	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	335	736	1261	-	-	-
Mov Cap-2 Maneuver	449	-	-	-	-	-
Stage 1	748	-	-	-	-	-
Stage 2	589	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1261	-	736	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	7.9	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	11	32	360	292	2
Future Vol, veh/h	3	11	32	360	292	2
Conflicting Peds, #/hr	0	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	3	12	34	383	311	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	765	315	315	0	-	0
Stage 1	314	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	374	730	1257	-	-	-
Stage 1	745	-	-	-	-	-
Stage 2	646	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	360	728	1255	-	-	-
Mov Cap-2 Maneuver	473	-	-	-	-	-
Stage 1	718	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1255	-	653	-	-
HCM Lane V/C Ratio	0.027	-	0.023	-	-
HCM Control Delay (s)	7.9	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	0	0	19	1	5
Future Vol, veh/h	4	0	0	19	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	0	0	28	1	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	6	0	34	6
Stage 1	-	-	-	-	6	-
Stage 2	-	-	-	-	28	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1628	-	984	1083
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1000	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1628	-	984	1083
Mov Cap-2 Maneuver	-	-	-	-	984	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1000	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1065	-	-	1628	-
HCM Lane V/C Ratio	0.008	-	-	-	-
HCM Control Delay (s)	8.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	0	257	61	0	157
Future Vol, veh/h	7	0	257	61	0	157
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	33	0	2	2	0	0
Mvmt Flow	13	0	476	113	0	291

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	874	583	0	0	639	0
Stage 1	583	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.73	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	283	516	-	-	955	-
Stage 1	502	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	269	491	-	-	910	-
Mov Cap-2 Maneuver	269	-	-	-	-	-
Stage 1	478	-	-	-	-	-
Stage 2	693	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	269	910	-
HCM Lane V/C Ratio	-	-	0.048	-	-
HCM Control Delay (s)	-	-	19.1	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	0	321	24	0	158
Future Vol, veh/h	7	0	321	24	0	158
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	0	0	2	0	0	33
Mvmt Flow	13	0	594	44	0	293

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	959	666	0	0	688	0
Stage 1	666	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	288	463	-	-	916	-
Stage 1	515	-	-	-	-	-
Stage 2	762	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	274	441	-	-	872	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	490	-	-	-	-	-
Stage 2	762	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	274	872	-
HCM Lane V/C Ratio	-	-	0.047	-	-
HCM Control Delay (s)	-	-	18.8	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	198	357	60	402	214	78	30	69	304	48	44	72
Future Volume (veh/h)	198	357	60	402	214	78	30	69	304	48	44	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1767	1767	1767
Adj Flow Rate, veh/h	233	420	71	473	252	92	35	81	358	56	52	85
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	9	9	9
Cap, veh/h	556	861	144	578	967	344	356	374	628	217	76	125
Arrive On Green	0.11	0.29	0.29	0.20	0.38	0.38	0.20	0.20	0.20	0.13	0.13	0.13
Sat Flow, veh/h	1767	3011	505	1781	2568	913	1781	1870	1543	1682	593	969
Grp Volume(v), veh/h	233	244	247	473	172	172	35	81	358	56	0	137
Grp Sat Flow(s),veh/h/ln	1767	1763	1753	1781	1777	1705	1781	1870	1543	1682	0	1562
Q Serve(g_s), s	10.0	12.5	12.7	19.4	7.3	7.6	1.7	3.9	19.7	3.3	0.0	9.1
Cycle Q Clear(g_c), s	10.0	12.5	12.7	19.4	7.3	7.6	1.7	3.9	19.7	3.3	0.0	9.1
Prop In Lane	1.00		0.29	1.00		0.54	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	556	504	501	578	669	642	356	374	628	217	0	201
V/C Ratio(X)	0.42	0.49	0.49	0.82	0.26	0.27	0.10	0.22	0.57	0.26	0.00	0.68
Avail Cap(c_a), veh/h	603	504	501	693	669	642	360	378	632	417	0	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.8	32.2	32.3	20.2	23.4	23.5	35.5	36.4	25.4	42.7	0.0	45.3
Incr Delay (d2), s/veh	0.2	3.3	3.4	5.4	0.9	1.0	0.0	0.1	0.8	0.2	0.0	1.5
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(95%),veh/ln	7.3	9.6	9.7	13.2	5.7	5.7	1.4	3.2	11.5	2.5	0.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.0	35.6	35.7	25.6	24.3	24.5	35.6	36.5	26.1	43.0	0.0	46.8
LnGrp LOS	C	D	D	C	C	C	D	D	C	D	A	D
Approach Vol, veh/h		724			817			474			193	
Approach Delay, s/veh		31.6			25.1			28.6			45.7	
Approach LOS		C			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		26.8	27.0	36.1		19.0	17.1	46.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	29.0	27.0		27.0	15.0	41.0				
Max Q Clear Time (g_c+I1), s		21.7	21.4	14.7		11.1	12.0	9.6				
Green Ext Time (p_c), s		0.1	0.5	1.5		0.5	0.1	1.3				

Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	680	682	88	4	12
Future Vol, veh/h	29	680	682	88	4	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	8	8
Mvmt Flow	31	723	726	94	4	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	820	0	-	0	1197	410
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	424	-
Critical Hdwy	4.14	-	-	-	6.96	7.06
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	2.22	-	-	-	3.58	3.38
Pot Cap-1 Maneuver	805	-	-	-	170	574
Stage 1	-	-	-	-	401	-
Stage 2	-	-	-	-	611	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	805	-	-	-	159	574
Mov Cap-2 Maneuver	-	-	-	-	159	-
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	611	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	805	-	-	-	347
HCM Lane V/C Ratio	0.038	-	-	-	0.049
HCM Control Delay (s)	9.7	0.3	-	-	15.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	640	748	107	125	23
Future Volume (veh/h)	44	640	748	107	125	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	49	711	831	119	139	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	197	1503	1469	210	281	53
Arrive On Green	0.47	0.47	0.47	0.47	0.19	0.19
Sat Flow, veh/h	93	3277	3214	447	1487	278
Grp Volume(v), veh/h	391	369	473	477	166	0
Grp Sat Flow(s),veh/h/ln	1668	1617	1777	1790	1776	0
Q Serve(g_s), s	0.0	4.1	5.1	5.1	2.2	0.0
Cycle Q Clear(g_c), s	3.7	4.1	5.1	5.1	2.2	0.0
Prop In Lane	0.13			0.25	0.84	0.16
Lane Grp Cap(c), veh/h	939	762	837	843	335	0
V/C Ratio(X)	0.42	0.48	0.57	0.57	0.49	0.00
Avail Cap(c_a), veh/h	1497	1375	1511	1522	1308	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.7	4.8	5.0	5.0	9.6	0.0
Incr Delay (d2), s/veh	0.3	0.5	0.6	0.6	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	0.8	1.2	1.2	1.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.0	5.3	5.7	5.6	10.7	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		760	950		166	
Approach Delay, s/veh		5.1	5.6		10.7	
Approach LOS		A	A		B	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		17.0		9.5	17.0
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		22.5		19.5	22.5
Max Q Clear Time (g_c+I1), s		6.1		4.2	7.1
Green Ext Time (p_c), s		4.5		0.4	5.4

Intersection Summary	
HCM 6th Ctrl Delay	5.9
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	760	850	143	66	6
Future Vol, veh/h	5	760	850	143	66	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	6	874	977	164	76	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1141	0	-	0	1508	571
Stage 1	-	-	-	-	1059	-
Stage 2	-	-	-	-	449	-
Critical Hdwy	4.14	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.22	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	608	-	-	-	114	469
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	616	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	608	-	-	-	112	469
Mov Cap-2 Maneuver	-	-	-	-	112	-
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	616	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	84.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	608	-	-	-	120
HCM Lane V/C Ratio	0.009	-	-	-	0.69
HCM Control Delay (s)	11	0.1	-	-	84.3
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	717	24	16	818	60	25	23	28	218	57	151
Future Volume (veh/h)	86	717	24	16	818	60	25	23	28	218	57	151
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		0.98	0.98		0.98
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	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	93	779	26	17	889	0	27	25	30	237	62	164
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	119	1696	57	36	1553		196	213	186	385	313	273
Arrive On Green	0.07	0.48	0.48	0.02	0.44	0.00	0.03	0.12	0.12	0.09	0.17	0.17
Sat Flow, veh/h	1781	3509	117	1781	3647	0	1795	1791	1561	1795	1791	1564
Grp Volume(v), veh/h	93	394	411	17	889	0	27	25	30	237	62	164
Grp Sat Flow(s),veh/h/ln	1781	1777	1849	1781	1777	0	1795	1791	1561	1795	1791	1564
Q Serve(g_s), s	3.2	9.1	9.1	0.6	11.6	0.0	0.0	0.8	1.1	0.0	1.8	6.0
Cycle Q Clear(g_c), s	3.2	9.1	9.1	0.6	11.6	0.0	0.0	0.8	1.1	0.0	1.8	6.0
Prop In Lane	1.00		0.06	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	119	859	894	36	1553		196	213	186	385	313	273
V/C Ratio(X)	0.78	0.46	0.46	0.47	0.57		0.14	0.12	0.16	0.62	0.20	0.60
Avail Cap(c_a), veh/h	187	859	894	144	1553		288	823	718	385	826	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.4	10.6	10.6	29.9	13.1	0.0	28.4	24.3	24.5	24.5	21.8	23.5
Incr Delay (d2), s/veh	4.1	1.8	1.7	3.4	1.5	0.0	0.1	0.1	0.2	2.2	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.5	6.0	6.2	0.5	7.6	0.0	0.7	0.6	0.7	5.9	1.3	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.5	12.4	12.3	33.3	14.6	0.0	28.5	24.4	24.6	26.7	21.9	24.3
LnGrp LOS	C	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		898			906	A		82			463	
Approach Delay, s/veh		14.4			14.9			25.8			25.2	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	11.8	5.8	34.4	6.4	15.3	8.6	31.5
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	5.1	28.4	5.0	28.5	5.0	28.5	6.5	27.0
Max Q Clear Time (g_c+I1), s	2.0	3.1	2.6	11.1	2.0	8.0	5.2	13.6
Green Ext Time (p_c), s	0.1	0.2	0.0	3.0	0.0	0.9	0.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	169	433	0
Future Vol, veh/h	0	2	2	169	433	0
Conflicting Peds, #/hr	0	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	4	1	0
Mvmt Flow	0	2	2	180	461	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	651	468	467	0	-	0
Stage 1	467	-	-	-	-	-
Stage 2	184	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	436	599	1105	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	852	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	430	595	1099	-	-	-
Mov Cap-2 Maneuver	516	-	-	-	-	-
Stage 1	630	-	-	-	-	-
Stage 2	847	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1099	-	595	-	-
HCM Lane V/C Ratio	0.002	-	0.004	-	-
HCM Control Delay (s)	8.3	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	12	124	398	5
Future Vol, veh/h	0	4	12	124	398	5
Conflicting Peds, #/hr	0	1	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	14	141	452	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	629	461	463	0	-	0
Stage 1	460	-	-	-	-	-
Stage 2	169	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	446	600	1098	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	861	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	435	597	1093	-	-	-
Mov Cap-2 Maneuver	516	-	-	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1093	-	597	-	-
HCM Lane V/C Ratio	0.012	-	0.008	-	-
HCM Control Delay (s)	8.3	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	0	10	5	0	1
Future Vol, veh/h	1	0	10	5	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	17	0	0	0	0	2
Mvmt Flow	2	0	19	9	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2	0	49	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	-	-	4.1	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1634	-	965	1082
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	981	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1634	-	953	1082
Mov Cap-2 Maneuver	-	-	-	-	953	-
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	969	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.8	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1082	-	-	1634	-
HCM Lane V/C Ratio	0.002	-	-	0.011	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	0	110	2	0	126
Future Vol, veh/h	16	0	110	2	0	126
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	25	0	175	3	0	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	397	197	0	0	198	0
Stage 1	197	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	612	849	-	-	1387	-
Stage 1	841	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	600	833	-	-	1361	-
Mov Cap-2 Maneuver	600	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	600	1361	-
HCM Lane V/C Ratio	-	-	0.042	-	-
HCM Control Delay (s)	-	-	11.3	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	0	112	1	0	142
Future Vol, veh/h	4	0	112	1	0	142
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	151	1	0	192

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	364	172	0	0	172	0
Stage 1	172	-	-	-	-	-
Stage 2	192	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	639	877	-	-	1417	-
Stage 1	863	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	627	860	-	-	1390	-
Mov Cap-2 Maneuver	627	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	845	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	627	1390	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	-	-	10.8	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	434	40	329	533	37	73	17	303	66	25	57
Future Volume (veh/h)	65	434	40	329	533	37	73	17	303	66	25	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	70	467	43	354	573	40	78	18	326	71	27	61
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	321	784	72	452	1210	84	629	660	807	139	39	89
Arrive On Green	0.04	0.24	0.24	0.16	0.36	0.36	0.35	0.35	0.35	0.08	0.08	0.08
Sat Flow, veh/h	1795	3311	304	1795	3395	237	1795	1885	1567	1795	506	1143
Grp Volume(v), veh/h	70	252	258	354	302	311	78	18	326	71	0	88
Grp Sat Flow(s),veh/h/ln	1795	1791	1824	1795	1791	1841	1795	1885	1567	1795	0	1649
Q Serve(g_s), s	3.4	14.4	14.5	16.5	15.0	15.1	3.4	0.7	14.8	4.4	0.0	6.0
Cycle Q Clear(g_c), s	3.4	14.4	14.5	16.5	15.0	15.1	3.4	0.7	14.8	4.4	0.0	6.0
Prop In Lane	1.00		0.17	1.00		0.13	1.00		1.00	1.00		0.69
Lane Grp Cap(c), veh/h	321	424	432	452	639	656	629	660	807	139	0	128
V/C Ratio(X)	0.22	0.59	0.60	0.78	0.47	0.47	0.12	0.03	0.40	0.51	0.00	0.69
Avail Cap(c_a), veh/h	324	424	432	459	639	656	629	660	807	422	0	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.1	39.0	39.0	26.4	28.6	28.7	25.4	24.5	17.3	50.9	0.0	51.7
Incr Delay (d2), s/veh	0.1	6.0	6.0	7.8	2.5	2.4	0.4	0.1	1.5	1.1	0.0	2.5
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(95%),veh/ln	2.6	11.3	11.5	12.4	11.0	11.3	2.7	0.6	9.3	3.6	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	44.9	45.0	34.2	31.1	31.1	25.8	24.6	18.8	52.0	0.0	54.1
LnGrp LOS	C	D	D	C	C	C	C	C	B	D	A	D
Approach Vol, veh/h		580			967			422			159	
Approach Delay, s/veh		43.3			32.2			20.4			53.2	
Approach LOS		D			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		45.3	23.5	32.2		13.9	9.8	46.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	19.0	27.0		27.0	5.0	41.0				
Max Q Clear Time (g_c+I1), s		16.8	18.5	16.5		8.0	5.4	17.1				
Green Ext Time (p_c), s		0.4	0.0	1.4		0.4	0.0	2.3				

Intersection Summary												
HCM 6th Ctrl Delay			34.5									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	807	894	7	48	22
Future Vol, veh/h	2	807	894	7	48	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	2	841	931	7	50	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	938	0	-	0	1360	469
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	425	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	732	-	-	-	142	546
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	633	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	732	-	-	-	141	546
Mov Cap-2 Maneuver	-	-	-	-	141	-
Stage 1	-	-	-	-	345	-
Stage 2	-	-	-	-	633	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	36.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	732	-	-	-	184
HCM Lane V/C Ratio	0.003	-	-	-	0.396
HCM Control Delay (s)	9.9	0	-	-	36.9
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	852	849	12	138	46
Future Volume (veh/h)	8	852	849	12	138	46
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	8	897	894	13	145	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	66	1200	1243	18	655	217
Arrive On Green	0.34	0.34	0.34	0.34	0.50	0.50
Sat Flow, veh/h	9	3575	3708	53	1308	433
Grp Volume(v), veh/h	484	421	443	464	194	0
Grp Sat Flow(s),veh/h/ln	1868	1630	1791	1876	1750	0
Q Serve(g_s), s	0.0	13.3	12.5	12.5	3.6	0.0
Cycle Q Clear(g_c), s	13.1	13.3	12.5	12.5	3.6	0.0
Prop In Lane	0.02			0.03	0.75	0.25
Lane Grp Cap(c), veh/h	705	561	616	645	877	0
V/C Ratio(X)	0.69	0.75	0.72	0.72	0.22	0.00
Avail Cap(c_a), veh/h	974	801	880	922	877	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.8	16.8	16.6	16.6	8.1	0.0
Incr Delay (d2), s/veh	1.2	2.4	1.6	1.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.8	8.1	8.2	8.5	2.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.0	19.3	18.2	18.1	8.7	0.0
LnGrp LOS	B	B	B	B	A	A
Approach Vol, veh/h		905	907		194	
Approach Delay, s/veh		18.6	18.2		8.7	
Approach LOS		B	B		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			24.4		33.6	24.4
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			28.5		20.5	28.5
Max Q Clear Time (g_c+I1), s			15.3		5.6	14.5
Green Ext Time (p_c), s			4.7		0.5	4.8

Intersection Summary		
HCM 6th Ctrl Delay	17.4	
HCM 6th LOS	B	

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	965	847	14	59	4
Future Vol, veh/h	0	965	847	14	59	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	1027	901	15	63	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	916	0	-	0	1423	458
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	514	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	747	-	-	-	129	555
Stage 1	-	-	-	-	358	-
Stage 2	-	-	-	-	571	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	747	-	-	-	129	555
Mov Cap-2 Maneuver	-	-	-	-	129	-
Stage 1	-	-	-	-	358	-
Stage 2	-	-	-	-	571	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	54.8
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	747	-	-	-	136
HCM Lane V/C Ratio	-	-	-	-	0.493
HCM Control Delay (s)	0	-	-	-	54.8
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	827	52	67	695	226	28	92	69	178	60	124
Future Volume (veh/h)	135	827	52	67	695	226	28	92	69	178	60	124
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	0.99		0.95	0.99		0.97
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	1885	1885	1885	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	141	861	54	70	724	0	29	96	72	185	62	129
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	178	1571	99	99	1487		291	264	178	351	318	276
Arrive On Green	0.10	0.46	0.46	0.06	0.42	0.00	0.03	0.13	0.13	0.08	0.18	0.18
Sat Flow, veh/h	1795	3422	215	1795	3676	0	1810	2023	1361	1795	1791	1555
Grp Volume(v), veh/h	141	451	464	70	724	0	29	84	84	185	62	129
Grp Sat Flow(s),veh/h/ln	1795	1791	1846	1795	1791	0	1810	1805	1579	1795	1791	1555
Q Serve(g_s), s	5.0	11.8	11.8	2.5	9.6	0.0	0.9	2.8	3.2	5.1	1.9	4.8
Cycle Q Clear(g_c), s	5.0	11.8	11.8	2.5	9.6	0.0	0.9	2.8	3.2	5.1	1.9	4.8
Prop In Lane	1.00		0.12	1.00		0.00	1.00		0.86	1.00		1.00
Lane Grp Cap(c), veh/h	178	822	848	99	1487		291	236	206	351	318	276
V/C Ratio(X)	0.79	0.55	0.55	0.71	0.49		0.10	0.36	0.41	0.53	0.19	0.47
Avail Cap(c_a), veh/h	213	822	848	179	1487		374	755	660	351	752	653
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	12.7	12.7	30.2	13.9	0.0	23.2	25.8	26.0	22.8	22.8	24.0
Incr Delay (d2), s/veh	12.8	2.6	2.5	3.4	1.1	0.0	0.1	0.3	0.5	0.7	0.1	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(95%),veh/ln	4.8	8.1	8.3	2.0	6.5	0.0	0.7	2.1	2.1	4.3	1.4	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.4	15.3	15.3	33.6	15.1	0.0	23.3	26.1	26.4	23.5	22.9	24.4
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		1056			794	A		197			376	
Approach Delay, s/veh		18.8			16.7			25.8			23.7	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	13.0	8.1	34.4	6.5	16.0	11.0	31.5
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	5.1	27.2	6.5	28.2	5.0	27.3	7.7	27.0
Max Q Clear Time (g_c+I1), s	7.1	5.2	4.5	13.8	2.9	6.8	7.0	11.6
Green Ext Time (p_c), s	0.0	0.6	0.0	3.3	0.0	0.7	0.0	2.9

Intersection Summary	
HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	513	299	0
Future Vol, veh/h	0	4	1	513	299	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	4	1	558	325	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	888	328	328	0	-	0
Stage 1	328	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	317	718	1243	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	576	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	315	716	1239	-	-	-
Mov Cap-2 Maneuver	433	-	-	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	574	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1239	-	716	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	7.9	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	12	35	380	310	2
Future Vol, veh/h	4	12	35	380	310	2
Conflicting Peds, #/hr	0	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	4	13	37	404	330	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	811	334	334	0	-	0
Stage 1	333	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	352	712	1237	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	337	710	1235	-	-	-
Mov Cap-2 Maneuver	455	-	-	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	627	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1235	-	623	-	-
HCM Lane V/C Ratio	0.03	-	0.027	-	-
HCM Control Delay (s)	8	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	0	0	22	1	7
Future Vol, veh/h	4	0	0	22	1	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	0	0	32	1	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	6	0	38	6
Stage 1	-	-	-	-	6	-
Stage 2	-	-	-	-	32	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1628	-	979	1083
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1628	-	979	1083
Mov Cap-2 Maneuver	-	-	-	-	979	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	996	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1069	-	-	1628	-
HCM Lane V/C Ratio	0.011	-	-	-	-
HCM Control Delay (s)	8.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	0	257	61	0	157
Future Vol, veh/h	7	0	257	61	0	157
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	33	0	2	2	0	0
Mvmt Flow	13	0	476	113	0	291

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	874	583	0	0	639	0
Stage 1	583	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.73	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	283	516	-	-	955	-
Stage 1	502	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	269	491	-	-	910	-
Mov Cap-2 Maneuver	269	-	-	-	-	-
Stage 1	478	-	-	-	-	-
Stage 2	693	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	269	910	-
HCM Lane V/C Ratio	-	-	0.048	-	-
HCM Control Delay (s)	-	-	19.1	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	0	321	24	0	158
Future Vol, veh/h	7	0	321	24	0	158
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	0	0	2	0	0	33
Mvmt Flow	13	0	594	44	0	293

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	959	666	0	0	688	0
Stage 1	666	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	288	463	-	-	916	-
Stage 1	515	-	-	-	-	-
Stage 2	762	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	274	441	-	-	872	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	490	-	-	-	-	-
Stage 2	762	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	274	872	-
HCM Lane V/C Ratio	-	-	0.047	-	-
HCM Control Delay (s)	-	-	18.8	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	198	379	64	427	227	78	32	69	322	48	45	72
Future Volume (veh/h)	198	379	64	427	227	78	32	69	322	48	45	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1767	1767	1767
Adj Flow Rate, veh/h	233	446	75	502	267	92	38	81	379	56	53	85
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	9	9	9
Cap, veh/h	539	815	136	577	977	329	358	376	654	217	78	124
Arrive On Green	0.11	0.27	0.27	0.22	0.37	0.37	0.20	0.20	0.20	0.13	0.13	0.13
Sat Flow, veh/h	1767	3013	503	1781	2609	878	1781	1870	1543	1682	600	963
Grp Volume(v), veh/h	233	260	261	502	180	179	38	81	379	56	0	138
Grp Sat Flow(s),veh/h/ln	1767	1763	1753	1781	1777	1711	1781	1870	1543	1682	0	1563
Q Serve(g_s), s	10.3	13.8	14.0	21.2	7.7	8.0	1.9	4.0	20.7	3.3	0.0	9.2
Cycle Q Clear(g_c), s	10.3	13.8	14.0	21.2	7.7	8.0	1.9	4.0	20.7	3.3	0.0	9.2
Prop In Lane	1.00		0.29	1.00		0.51	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	539	477	474	577	665	641	358	376	654	217	0	202
V/C Ratio(X)	0.43	0.54	0.55	0.87	0.27	0.28	0.11	0.22	0.58	0.26	0.00	0.68
Avail Cap(c_a), veh/h	582	477	474	663	665	641	358	376	654	415	0	386
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.0	34.2	34.2	21.2	23.8	23.9	35.7	36.5	24.6	42.9	0.0	45.5
Incr Delay (d2), s/veh	0.2	4.4	4.6	9.8	1.0	1.1	0.0	0.1	0.9	0.2	0.0	1.5
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(95%),veh/ln	7.6	10.5	10.6	15.0	6.1	6.1	1.5	3.2	12.0	2.5	0.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	38.6	38.8	31.1	24.8	25.0	35.8	36.6	25.5	43.2	0.0	47.1
LnGrp LOS	C	D	D	C	C	C	D	D	C	D	A	D
Approach Vol, veh/h		754			861			498			194	
Approach Delay, s/veh		34.2			28.5			28.1			45.9	
Approach LOS		C			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0	28.7	34.6		19.1	17.3	46.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	29.0	27.0		27.0	15.0	41.0				
Max Q Clear Time (g_c+I1), s		22.7	23.2	16.0		11.2	12.3	10.0				
Green Ext Time (p_c), s		0.0	0.5	1.5		0.5	0.1	1.3				

Intersection Summary												
HCM 6th Ctrl Delay			31.7									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	720	720	88	4	12
Future Vol, veh/h	29	720	720	88	4	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	8	8
Mvmt Flow	31	766	766	94	4	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	860	0	-	0	1258	430
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	445	-
Critical Hdwy	4.14	-	-	-	6.96	7.06
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	2.22	-	-	-	3.58	3.38
Pot Cap-1 Maneuver	777	-	-	-	155	557
Stage 1	-	-	-	-	382	-
Stage 2	-	-	-	-	596	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	777	-	-	-	144	557
Mov Cap-2 Maneuver	-	-	-	-	144	-
Stage 1	-	-	-	-	356	-
Stage 2	-	-	-	-	596	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	777	-	-	-	324
HCM Lane V/C Ratio	0.04	-	-	-	0.053
HCM Control Delay (s)	9.8	0.3	-	-	16.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	680	786	107	125	23
Future Volume (veh/h)	44	680	786	107	125	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	49	756	873	119	139	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	191	1539	1512	206	275	52
Arrive On Green	0.48	0.48	0.48	0.48	0.19	0.19
Sat Flow, veh/h	88	3283	3235	428	1487	278
Grp Volume(v), veh/h	414	391	494	498	166	0
Grp Sat Flow(s),veh/h/ln	1669	1617	1777	1793	1776	0
Q Serve(g_s), s	0.0	4.5	5.4	5.4	2.3	0.0
Cycle Q Clear(g_c), s	4.0	4.5	5.4	5.4	2.3	0.0
Prop In Lane	0.12			0.24	0.84	0.16
Lane Grp Cap(c), veh/h	952	778	855	863	329	0
V/C Ratio(X)	0.43	0.50	0.58	0.58	0.50	0.00
Avail Cap(c_a), veh/h	1471	1348	1481	1495	1283	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.7	4.8	5.0	5.0	9.9	0.0
Incr Delay (d2), s/veh	0.3	0.5	0.6	0.6	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	0.9	1.2	1.2	1.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.0	5.3	5.6	5.6	11.1	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		805	992		166	
Approach Delay, s/veh		5.1	5.6		11.1	
Approach LOS		A	A		B	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		17.5		9.5	17.5
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		22.5		19.5	22.5
Max Q Clear Time (g_c+I1), s		6.5		4.3	7.4
Green Ext Time (p_c), s		4.8		0.4	5.6

Intersection Summary	
HCM 6th Ctrl Delay	5.9
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	800	888	143	66	6
Future Vol, veh/h	5	800	888	143	66	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	6	920	1021	164	76	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1185	0	-	0	1575	593
Stage 1	-	-	-	-	1103	-
Stage 2	-	-	-	-	472	-
Critical Hdwy	4.14	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.22	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	585	-	-	-	103	454
Stage 1	-	-	-	-	284	-
Stage 2	-	-	-	-	600	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	585	-	-	-	101	454
Mov Cap-2 Maneuver	-	-	-	-	101	-
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	600	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	105.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	585	-	-	-	108
HCM Lane V/C Ratio	0.01	-	-	-	0.766
HCM Control Delay (s)	11.2	0.1	-	-	105.2
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	751	25	17	848	63	27	25	30	231	60	157
Future Volume (veh/h)	91	751	25	17	848	63	27	25	30	231	60	157
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		0.98	0.98		0.98
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	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	99	816	27	18	922	0	29	27	33	251	65	171
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	127	1689	56	38	1533		191	211	184	384	319	279
Arrive On Green	0.07	0.48	0.48	0.02	0.43	0.00	0.03	0.12	0.12	0.09	0.18	0.18
Sat Flow, veh/h	1781	3510	116	1781	3647	0	1795	1791	1561	1795	1791	1564
Grp Volume(v), veh/h	99	413	430	18	922	0	29	27	33	251	65	171
Grp Sat Flow(s),veh/h/ln	1781	1777	1849	1781	1777	0	1795	1791	1561	1795	1791	1564
Q Serve(g_s), s	3.4	9.8	9.8	0.6	12.5	0.0	0.0	0.8	1.2	0.4	1.9	6.3
Cycle Q Clear(g_c), s	3.4	9.8	9.8	0.6	12.5	0.0	0.0	0.8	1.2	0.4	1.9	6.3
Prop In Lane	1.00		0.06	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	855	890	38	1533		191	211	184	384	319	279
V/C Ratio(X)	0.78	0.48	0.48	0.47	0.60		0.15	0.13	0.18	0.65	0.20	0.61
Avail Cap(c_a), veh/h	185	855	890	142	1533		278	813	708	384	815	712
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	11.0	11.0	30.3	13.7	0.0	29.0	24.7	24.9	24.8	21.9	23.7
Incr Delay (d2), s/veh	6.8	2.0	1.9	3.3	1.8	0.0	0.1	0.1	0.2	3.2	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.9	6.6	6.8	0.5	8.1	0.0	0.7	0.6	0.8	6.4	1.4	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.4	12.9	12.9	33.6	15.4	0.0	29.1	24.8	25.0	28.0	22.0	24.6
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		942			940	A		89			487	
Approach Delay, s/veh		15.3			15.8			26.3			26.0	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	11.9	5.8	34.6	6.5	15.7	9.0	31.5
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	5.1	28.4	5.0	28.5	5.0	28.5	6.5	27.0
Max Q Clear Time (g_c+I1), s	2.4	3.2	2.6	11.8	2.0	8.3	5.4	14.5
Green Ext Time (p_c), s	0.1	0.2	0.0	3.1	0.0	0.9	0.0	3.6

Intersection Summary	
HCM 6th Ctrl Delay	18.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	179	455	0
Future Vol, veh/h	0	2	2	179	455	0
Conflicting Peds, #/hr	0	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	4	1	0
Mvmt Flow	0	2	2	190	484	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	684	491	490	0	-	0
Stage 1	490	-	-	-	-	-
Stage 2	194	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	417	582	1084	-	-	-
Stage 1	620	-	-	-	-	-
Stage 2	844	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	411	578	1078	-	-	-
Mov Cap-2 Maneuver	501	-	-	-	-	-
Stage 1	615	-	-	-	-	-
Stage 2	839	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1078	-	578	-	-
HCM Lane V/C Ratio	0.002	-	0.004	-	-
HCM Control Delay (s)	8.3	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	12	134	420	5
Future Vol, veh/h	0	4	12	134	420	5
Conflicting Peds, #/hr	0	1	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	14	152	477	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	665	486	488	0	-	0
Stage 1	485	-	-	-	-	-
Stage 2	180	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	425	581	1075	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	851	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	415	578	1070	-	-	-
Mov Cap-2 Maneuver	500	-	-	-	-	-
Stage 1	607	-	-	-	-	-
Stage 2	847	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1070	-	578	-	-
HCM Lane V/C Ratio	0.013	-	0.008	-	-
HCM Control Delay (s)	8.4	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	0	10	5	0	1
Future Vol, veh/h	1	0	10	5	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	17	0	0	0	0	2
Mvmt Flow	2	0	19	9	0	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2	0	49	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	-	-	4.1	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1634	-	965	1082
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	981	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1634	-	953	1082
Mov Cap-2 Maneuver	-	-	-	-	953	-
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	969	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.8	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1082	-	-	1634	-
HCM Lane V/C Ratio	0.002	-	-	0.011	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	0	110	2	0	126
Future Vol, veh/h	16	0	110	2	0	126
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	25	0	175	3	0	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	397	197	0	0	198	0
Stage 1	197	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	612	849	-	-	1387	-
Stage 1	841	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	600	833	-	-	1361	-
Mov Cap-2 Maneuver	600	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	600	1361	-
HCM Lane V/C Ratio	-	-	0.042	-	-
HCM Control Delay (s)	-	-	11.3	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	0	112	1	0	142
Future Vol, veh/h	4	0	112	1	0	142
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	0	151	1	0	192

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	364	172	0	0	172	0
Stage 1	172	-	-	-	-	-
Stage 2	192	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	639	877	-	-	1417	-
Stage 1	863	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	627	860	-	-	1390	-
Mov Cap-2 Maneuver	627	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	845	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	627	1390	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	-	-	10.8	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	461	42	349	566	37	77	18	321	66	25	57
Future Volume (veh/h)	65	461	42	349	566	37	77	18	321	66	25	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	70	496	45	375	609	40	83	19	345	71	27	61
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	309	778	70	446	1222	80	626	657	810	139	39	89
Arrive On Green	0.04	0.23	0.23	0.17	0.36	0.36	0.35	0.35	0.35	0.08	0.08	0.08
Sat Flow, veh/h	1795	3315	300	1795	3410	224	1795	1885	1567	1795	506	1143
Grp Volume(v), veh/h	70	267	274	375	319	330	83	19	345	71	0	88
Grp Sat Flow(s),veh/h/ln	1795	1791	1824	1795	1791	1843	1795	1885	1567	1795	0	1649
Q Serve(g_s), s	3.4	15.4	15.5	17.7	16.0	16.1	3.6	0.8	15.8	4.4	0.0	6.0
Cycle Q Clear(g_c), s	3.4	15.4	15.5	17.7	16.0	16.1	3.6	0.8	15.8	4.4	0.0	6.0
Prop In Lane	1.00		0.16	1.00		0.12	1.00		1.00	1.00		0.69
Lane Grp Cap(c), veh/h	309	420	428	446	642	660	626	657	810	139	0	128
V/C Ratio(X)	0.23	0.64	0.64	0.84	0.50	0.50	0.13	0.03	0.43	0.51	0.00	0.69
Avail Cap(c_a), veh/h	312	420	428	446	642	660	626	657	810	422	0	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.3	39.6	39.6	27.0	28.8	28.8	25.6	24.7	17.4	50.9	0.0	51.7
Incr Delay (d2), s/veh	0.1	7.1	7.1	12.8	2.7	2.7	0.4	0.1	1.6	1.1	0.0	2.5
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(95%),veh/ln	2.6	12.0	12.3	13.8	11.7	12.0	2.9	0.6	9.8	3.6	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.5	46.7	46.8	39.8	31.6	31.5	26.0	24.7	19.1	52.0	0.0	54.1
LnGrp LOS	C	D	D	D	C	C	C	C	B	D	A	D
Approach Vol, veh/h		611			1024			447			159	
Approach Delay, s/veh		45.0			34.6			20.6			53.2	
Approach LOS		D			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		45.1	24.0	32.0		13.9	9.8	46.2				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	19.0	27.0		27.0	5.0	41.0				
Max Q Clear Time (g_c+I1), s		17.8	19.7	17.5		8.0	5.4	18.1				
Green Ext Time (p_c), s		0.4	0.0	1.5		0.4	0.0	2.4				

Intersection Summary												
HCM 6th Ctrl Delay			35.9									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	852	947	7	48	22
Future Vol, veh/h	2	852	947	7	48	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	2	888	986	7	50	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	993	0	-	0	1438	497
Stage 1	-	-	-	-	990	-
Stage 2	-	-	-	-	448	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	698	-	-	-	126	524
Stage 1	-	-	-	-	325	-
Stage 2	-	-	-	-	616	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	698	-	-	-	125	524
Mov Cap-2 Maneuver	-	-	-	-	125	-
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	616	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	43.4
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	698	-	-	-	164
HCM Lane V/C Ratio	0.003	-	-	-	0.445
HCM Control Delay (s)	10.2	0	-	-	43.4
HCM Lane LOS	B	A	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	897	902	12	138	46
Future Volume (veh/h)	8	897	902	12	138	46
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	8	944	949	13	145	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	66	1248	1294	18	637	211
Arrive On Green	0.36	0.36	0.36	0.36	0.49	0.49
Sat Flow, veh/h	8	3575	3712	50	1308	433
Grp Volume(v), veh/h	509	443	470	492	194	0
Grp Sat Flow(s),veh/h/ln	1867	1630	1791	1876	1750	0
Q Serve(g_s), s	0.0	13.9	13.2	13.2	3.7	0.0
Cycle Q Clear(g_c), s	13.8	13.9	13.2	13.2	3.7	0.0
Prop In Lane	0.02			0.03	0.75	0.25
Lane Grp Cap(c), veh/h	731	583	641	671	853	0
V/C Ratio(X)	0.70	0.76	0.73	0.73	0.23	0.00
Avail Cap(c_a), veh/h	975	801	880	922	853	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.4	16.4	16.2	16.2	8.6	0.0
Incr Delay (d2), s/veh	1.4	2.9	2.0	2.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.1	8.5	8.6	8.9	2.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.8	19.3	18.3	18.2	9.2	0.0
LnGrp LOS	B	B	B	B	A	A
Approach Vol, veh/h		952	962		194	
Approach Delay, s/veh		18.5	18.2		9.2	
Approach LOS		B	B		A	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		25.2		32.8	25.2
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		28.5		20.5	28.5
Max Q Clear Time (g_c+I1), s		15.9		5.7	15.2
Green Ext Time (p_c), s		4.8		0.5	5.0

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1010	900	14	59	4
Future Vol, veh/h	0	1010	900	14	59	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	1074	957	15	63	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	972	0	-	0	1502	486
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	537	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	711	-	-	-	115	533
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	556	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	711	-	-	-	115	533
Mov Cap-2 Maneuver	-	-	-	-	115	-
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	556	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	66.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	711	-	-	-	121
HCM Lane V/C Ratio	-	-	-	-	0.554
HCM Control Delay (s)	0	-	-	-	66.6
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	863	55	71	739	240	29	98	74	188	64	132
Future Volume (veh/h)	141	863	55	71	739	240	29	98	74	188	64	132
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	0.99		0.96	0.99		0.97
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	1885	1885	1885	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	147	899	57	74	770	0	30	102	77	196	67	138
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	185	1567	99	101	1474		285	269	182	347	321	278
Arrive On Green	0.10	0.46	0.46	0.06	0.41	0.00	0.03	0.13	0.13	0.08	0.18	0.18
Sat Flow, veh/h	1795	3420	217	1795	3676	0	1810	2015	1368	1795	1791	1555
Grp Volume(v), veh/h	147	471	485	74	770	0	30	90	89	196	67	138
Grp Sat Flow(s),veh/h/ln	1795	1791	1845	1795	1791	0	1810	1805	1578	1795	1791	1555
Q Serve(g_s), s	5.2	12.7	12.7	2.7	10.6	0.0	0.9	3.0	3.4	5.1	2.1	5.2
Cycle Q Clear(g_c), s	5.2	12.7	12.7	2.7	10.6	0.0	0.9	3.0	3.4	5.1	2.1	5.2
Prop In Lane	1.00		0.12	1.00		0.00	1.00		0.87	1.00		1.00
Lane Grp Cap(c), veh/h	185	820	845	101	1474		285	241	211	347	321	278
V/C Ratio(X)	0.79	0.57	0.57	0.73	0.52		0.11	0.37	0.42	0.56	0.21	0.50
Avail Cap(c_a), veh/h	211	820	845	178	1474		365	748	654	347	745	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	13.1	13.1	30.5	14.5	0.0	23.3	25.9	26.1	23.4	23.0	24.3
Incr Delay (d2), s/veh	14.5	2.9	2.8	3.7	1.3	0.0	0.1	0.4	0.5	1.3	0.1	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(95%),veh/ln	5.2	8.7	8.8	2.1	7.2	0.0	0.7	2.2	2.2	4.7	1.5	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	16.0	15.9	34.2	15.8	0.0	23.3	26.3	26.6	24.7	23.1	24.8
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		1103			844	A		209			401	
Approach Delay, s/veh		19.6			17.4			26.0			24.4	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	13.3	8.2	34.6	6.6	16.2	11.3	31.5
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	5.1	27.2	6.5	28.2	5.0	27.3	7.7	27.0
Max Q Clear Time (g_c+I1), s	7.1	5.4	4.7	14.7	2.9	7.2	7.2	12.6
Green Ext Time (p_c), s	0.0	0.6	0.0	3.4	0.0	0.8	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	539	321	0
Future Vol, veh/h	0	4	1	539	321	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	4	1	586	349	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	940	352	352	0	-	0
Stage 1	352	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	295	696	1218	-	-	-
Stage 1	716	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	293	694	1215	-	-	-
Mov Cap-2 Maneuver	415	-	-	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	557	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1215	-	694	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	8	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	12	35	406	332	2
Future Vol, veh/h	4	12	35	406	332	2
Conflicting Peds, #/hr	0	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	4	13	37	432	353	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	862	357	357	0	-	0
Stage 1	356	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	328	692	1213	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	610	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	314	690	1211	-	-	-
Mov Cap-2 Maneuver	436	-	-	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	609	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1211	-	602	-	-
HCM Lane V/C Ratio	0.031	-	0.028	-	-
HCM Control Delay (s)	8.1	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	4	0	0	22	1	7
Future Vol, veh/h	4	0	0	22	1	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	0	0	32	1	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	6	0	38	6
Stage 1	-	-	-	-	6	-
Stage 2	-	-	-	-	32	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1628	-	979	1083
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1628	-	979	1083
Mov Cap-2 Maneuver	-	-	-	-	979	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	996	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1069	-	-	1628	-
HCM Lane V/C Ratio	0.011	-	-	-	-
HCM Control Delay (s)	8.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	0	257	73	0	157
Future Vol, veh/h	12	0	257	73	0	157
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	33	0	2	2	0	0
Mvmt Flow	22	0	476	135	0	291

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	885	594	0	0	661	0
Stage 1	594	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.73	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	279	509	-	-	937	-
Stage 1	496	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	266	485	-	-	892	-
Mov Cap-2 Maneuver	266	-	-	-	-	-
Stage 1	472	-	-	-	-	-
Stage 2	693	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	266	892	-
HCM Lane V/C Ratio	-	-	0.084	-	-
HCM Control Delay (s)	-	-	19.8	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	333	0	0	163
Future Vol, veh/h	0	0	333	0	0	163
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	0	0	2	0	0	33
Mvmt Flow	0	0	617	0	0	302

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	969	667	0	0	667	0
Stage 1	667	-	-	-	-	-
Stage 2	302	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	284	462	-	-	932	-
Stage 1	514	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	270	440	-	-	888	-
Mov Cap-2 Maneuver	270	-	-	-	-	-
Stage 1	489	-	-	-	-	-
Stage 2	755	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	888	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	374	64	426	228	75	32	67	320	47	45	71
Future Volume (veh/h)	191	374	64	426	228	75	32	67	320	47	45	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1767	1767	1767
Adj Flow Rate, veh/h	225	440	75	501	268	88	38	79	376	55	53	84
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	9	9	9
Cap, veh/h	534	809	137	579	995	319	360	378	655	216	78	123
Arrive On Green	0.11	0.27	0.27	0.22	0.38	0.38	0.20	0.20	0.20	0.13	0.13	0.13
Sat Flow, veh/h	1767	3006	509	1781	2644	849	1781	1870	1544	1682	605	959
Grp Volume(v), veh/h	225	257	258	501	178	178	38	79	376	55	0	137
Grp Sat Flow(s),veh/h/ln	1767	1763	1752	1781	1777	1716	1781	1870	1544	1682	0	1564
Q Serve(g_s), s	9.9	13.6	13.8	21.1	7.6	7.9	1.9	3.8	20.4	3.2	0.0	9.1
Cycle Q Clear(g_c), s	9.9	13.6	13.8	21.1	7.6	7.9	1.9	3.8	20.4	3.2	0.0	9.1
Prop In Lane	1.00		0.29	1.00		0.49	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	534	474	472	579	668	646	360	378	655	216	0	201
V/C Ratio(X)	0.42	0.54	0.55	0.87	0.27	0.28	0.11	0.21	0.57	0.25	0.00	0.68
Avail Cap(c_a), veh/h	583	474	472	666	668	646	360	378	655	417	0	388
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.1	34.1	34.1	21.2	23.6	23.7	35.5	36.2	24.3	42.8	0.0	45.3
Incr Delay (d2), s/veh	0.2	4.4	4.5	9.5	1.0	1.1	0.0	0.1	0.8	0.2	0.0	1.5
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(95%),veh/ln	7.3	10.4	10.5	14.9	5.9	6.0	1.5	3.1	11.8	2.5	0.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.3	38.4	38.7	30.6	24.5	24.7	35.5	36.3	25.1	43.0	0.0	46.9
LnGrp LOS	C	D	D	C	C	C	D	D	C	D	A	D
Approach Vol, veh/h		740			857			493			192	
Approach Delay, s/veh		34.2			28.1			27.7			45.8	
Approach LOS		C			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0	28.6	34.3		19.0	17.0	46.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	29.0	27.0		27.0	15.0	41.0				
Max Q Clear Time (g_c+I1), s		22.4	23.1	15.8		11.1	11.9	9.9				
Green Ext Time (p_c), s		0.0	0.5	1.5		0.5	0.1	1.3				

Intersection Summary	
HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	716	719	76	3	10
Future Vol, veh/h	25	716	719	76	3	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	8	8
Mvmt Flow	27	762	765	81	3	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	846	0	-	0	1241	423
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	435	-
Critical Hdwy	4.14	-	-	-	6.96	7.06
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	2.22	-	-	-	3.58	3.38
Pot Cap-1 Maneuver	787	-	-	-	159	563
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	603	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	787	-	-	-	150	563
Mov Cap-2 Maneuver	-	-	-	-	150	-
Stage 1	-	-	-	-	362	-
Stage 2	-	-	-	-	603	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	787	-	-	-	344
HCM Lane V/C Ratio	0.034	-	-	-	0.04
HCM Control Delay (s)	9.7	0.3	-	-	15.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	688	776	71	93	20
Future Volume (veh/h)	31	688	776	71	93	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	34	764	862	79	103	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	175	1546	1538	141	276	59
Arrive On Green	0.47	0.47	0.47	0.47	0.19	0.19
Sat Flow, veh/h	57	3393	3385	302	1448	309
Grp Volume(v), veh/h	418	380	465	476	126	0
Grp Sat Flow(s),veh/h/ln	1748	1617	1777	1816	1772	0
Q Serve(g_s), s	0.0	4.3	5.0	5.0	1.6	0.0
Cycle Q Clear(g_c), s	4.0	4.3	5.0	5.0	1.6	0.0
Prop In Lane	0.08			0.17	0.82	0.17
Lane Grp Cap(c), veh/h	965	756	830	849	337	0
V/C Ratio(X)	0.43	0.50	0.56	0.56	0.37	0.00
Avail Cap(c_a), veh/h	1584	1384	1521	1555	1315	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.8	4.9	5.1	5.1	9.3	0.0
Incr Delay (d2), s/veh	0.3	0.5	0.6	0.6	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	0.9	1.1	1.1	0.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.1	5.4	5.6	5.6	10.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		798	941		126	
Approach Delay, s/veh		5.2	5.6		10.0	
Approach LOS		A	A		A	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		16.8		9.5	16.8
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		22.5		19.5	22.5
Max Q Clear Time (g_c+I1), s		6.3		3.6	7.0
Green Ext Time (p_c), s		4.7		0.3	5.3

Intersection Summary	
HCM 6th Ctrl Delay	5.8
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	767	837	124	57	11
Future Vol, veh/h	14	767	837	124	57	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	16	882	962	143	66	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1105	0	-	0	1507	553
Stage 1	-	-	-	-	1034	-
Stage 2	-	-	-	-	473	-
Critical Hdwy	4.14	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.22	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	628	-	-	-	114	482
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	628	-	-	-	108	482
Mov Cap-2 Maneuver	-	-	-	-	108	-
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	599	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	74
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	628	-	-	-	124
HCM Lane V/C Ratio	0.026	-	-	-	0.63
HCM Control Delay (s)	10.9	0.3	-	-	74
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	708	25	17	778	62	27	26	30	232	60	157
Future Volume (veh/h)	92	708	25	17	778	62	27	26	30	232	60	157
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		0.98	0.98		0.98
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	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	100	770	27	18	846	0	29	28	33	252	65	171
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	128	1686	59	38	1531		191	211	184	384	319	279
Arrive On Green	0.07	0.48	0.48	0.02	0.43	0.00	0.03	0.12	0.12	0.09	0.18	0.18
Sat Flow, veh/h	1781	3502	123	1781	3647	0	1795	1791	1561	1795	1791	1564
Grp Volume(v), veh/h	100	391	406	18	846	0	29	28	33	252	65	171
Grp Sat Flow(s),veh/h/ln	1781	1777	1848	1781	1777	0	1795	1791	1561	1795	1791	1564
Q Serve(g_s), s	3.5	9.2	9.2	0.6	11.1	0.0	0.0	0.9	1.2	0.4	1.9	6.3
Cycle Q Clear(g_c), s	3.5	9.2	9.2	0.6	11.1	0.0	0.0	0.9	1.2	0.4	1.9	6.3
Prop In Lane	1.00		0.07	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	128	855	890	38	1531		191	211	184	384	319	279
V/C Ratio(X)	0.78	0.46	0.46	0.47	0.55		0.15	0.13	0.18	0.66	0.20	0.61
Avail Cap(c_a), veh/h	185	855	890	142	1531		278	812	708	384	815	711
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	10.8	10.8	30.3	13.3	0.0	29.0	24.8	24.9	24.8	22.0	23.8
Incr Delay (d2), s/veh	7.2	1.8	1.7	3.3	1.4	0.0	0.1	0.1	0.2	3.3	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.9	6.1	6.3	0.5	7.3	0.0	0.7	0.6	0.8	6.5	1.4	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	12.6	12.5	33.6	14.8	0.0	29.2	24.9	25.1	28.1	22.1	24.6
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		897			864	A		90			488	
Approach Delay, s/veh		15.1			15.1			26.3			26.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	11.9	5.8	34.7	6.5	15.7	9.0	31.5
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	5.1	28.4	5.0	28.5	5.0	28.5	6.5	27.0
Max Q Clear Time (g_c+I1), s	2.4	3.2	2.6	11.2	2.0	8.3	5.5	13.1
Green Ext Time (p_c), s	0.1	0.2	0.0	2.9	0.0	0.9	0.0	3.4

Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	180	456	0
Future Vol, veh/h	0	2	2	180	456	0
Conflicting Peds, #/hr	0	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	4	1	0
Mvmt Flow	0	2	2	191	485	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	686	492	491	0	-	0
Stage 1	491	-	-	-	-	-
Stage 2	195	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	416	581	1083	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	843	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	410	577	1077	-	-	-
Mov Cap-2 Maneuver	500	-	-	-	-	-
Stage 1	614	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1077	-	577	-	-
HCM Lane V/C Ratio	0.002	-	0.004	-	-
HCM Control Delay (s)	8.3	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	13	134	420	6
Future Vol, veh/h	0	5	13	134	420	6
Conflicting Peds, #/hr	0	1	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	6	15	152	477	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	668	487	489	0	-	0
Stage 1	486	-	-	-	-	-
Stage 2	182	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	423	581	1074	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	849	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	412	578	1069	-	-	-
Mov Cap-2 Maneuver	498	-	-	-	-	-
Stage 1	606	-	-	-	-	-
Stage 2	845	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1069	-	578	-	-
HCM Lane V/C Ratio	0.014	-	0.01	-	-
HCM Control Delay (s)	8.4	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	0	13	4	0	2
Future Vol, veh/h	1	0	13	4	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	17	0	0	0	0	2
Mvmt Flow	2	0	24	7	0	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2	0	57	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	55	-
Critical Hdwy	-	-	4.1	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1634	-	955	1082
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	973	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1634	-	941	1082
Mov Cap-2 Maneuver	-	-	-	-	941	-
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	958	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.5	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1082	-	-	1634	-
HCM Lane V/C Ratio	0.003	-	-	0.015	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	17	0	110	3	0	126
Future Vol, veh/h	17	0	110	3	0	126
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	27	0	175	5	0	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	398	198	0	0	200	0
Stage 1	198	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	611	848	-	-	1384	-
Stage 1	840	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	599	832	-	-	1358	-
Mov Cap-2 Maneuver	599	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	599	1358	-
HCM Lane V/C Ratio	-	-	0.045	-	-
HCM Control Delay (s)	-	-	11.3	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	113	0	0	143
Future Vol, veh/h	0	0	113	0	0	143
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	153	0	0	193

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	366	173	0	0	173	0
Stage 1	173	-	-	-	-	-
Stage 2	193	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	638	876	-	-	1416	-
Stage 1	862	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	626	859	-	-	1389	-
Mov Cap-2 Maneuver	626	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	845	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1389	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	461	42	348	563	37	77	18	320	65	24	56
Future Volume (veh/h)	65	461	42	348	563	37	77	18	320	65	24	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	70	496	45	374	605	40	83	19	344	70	26	60
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	311	778	70	446	1221	81	628	659	812	137	38	88
Arrive On Green	0.04	0.23	0.23	0.17	0.36	0.36	0.35	0.35	0.35	0.08	0.08	0.08
Sat Flow, veh/h	1795	3315	300	1795	3409	225	1795	1885	1567	1795	498	1149
Grp Volume(v), veh/h	70	267	274	374	317	328	83	19	344	70	0	86
Grp Sat Flow(s),veh/h/ln	1795	1791	1824	1795	1791	1843	1795	1885	1567	1795	0	1647
Q Serve(g_s), s	3.4	15.4	15.5	17.6	15.9	16.0	3.6	0.8	15.7	4.3	0.0	5.9
Cycle Q Clear(g_c), s	3.4	15.4	15.5	17.6	15.9	16.0	3.6	0.8	15.7	4.3	0.0	5.9
Prop In Lane	1.00		0.16	1.00		0.12	1.00		1.00	1.00		0.70
Lane Grp Cap(c), veh/h	311	420	428	446	642	660	628	659	812	137	0	126
V/C Ratio(X)	0.23	0.64	0.64	0.84	0.49	0.50	0.13	0.03	0.42	0.51	0.00	0.68
Avail Cap(c_a), veh/h	314	420	428	446	642	660	628	659	812	422	0	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.3	39.6	39.6	27.0	28.8	28.8	25.5	24.6	17.3	51.0	0.0	51.8
Incr Delay (d2), s/veh	0.1	7.1	7.1	12.6	2.7	2.7	0.4	0.1	1.6	1.1	0.0	2.4
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(95%),veh/ln	2.6	12.0	12.3	13.7	11.6	11.9	2.9	0.6	9.8	3.6	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.5	46.7	46.8	39.5	31.5	31.5	25.9	24.6	19.0	52.1	0.0	54.2
LnGrp LOS	C	D	D	D	C	C	C	C	B	D	A	D
Approach Vol, veh/h		611			1019			446			156	
Approach Delay, s/veh		45.0			34.4			20.5			53.3	
Approach LOS		D			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		45.2	24.0	32.0		13.8	9.8	46.2				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	19.0	27.0		27.0	5.0	41.0				
Max Q Clear Time (g_c+I1), s		17.7	19.6	17.5		7.9	5.4	18.0				
Green Ext Time (p_c), s		0.4	0.0	1.5		0.4	0.0	2.4				

Intersection Summary												
HCM 6th Ctrl Delay			35.9									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	850	947	6	42	19
Future Vol, veh/h	2	850	947	6	42	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	2	885	986	6	44	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	992	0	-	0	1436	496
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	699	-	-	-	127	525
Stage 1	-	-	-	-	325	-
Stage 2	-	-	-	-	617	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	699	-	-	-	126	525
Mov Cap-2 Maneuver	-	-	-	-	126	-
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	617	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	39.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	699	-	-	-	165
HCM Lane V/C Ratio	0.003	-	-	-	0.385
HCM Control Delay (s)	10.2	0	-	-	39.9
HCM Lane LOS	B	A	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	891	907	9	91	40
Future Volume (veh/h)	6	891	907	9	91	40
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	6	938	955	9	96	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	65	1241	1290	12	588	257
Arrive On Green	0.35	0.35	0.35	0.35	0.49	0.49
Sat Flow, veh/h	5	3583	3730	34	1200	525
Grp Volume(v), veh/h	505	439	470	494	139	0
Grp Sat Flow(s),veh/h/ln	1873	1630	1791	1879	1738	0
Q Serve(g_s), s	0.0	13.8	13.3	13.3	2.6	0.0
Cycle Q Clear(g_c), s	13.7	13.8	13.3	13.3	2.6	0.0
Prop In Lane	0.01			0.02	0.69	0.30
Lane Grp Cap(c), veh/h	728	578	636	667	851	0
V/C Ratio(X)	0.69	0.76	0.74	0.74	0.16	0.00
Avail Cap(c_a), veh/h	978	801	880	923	851	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.5	16.5	16.4	16.4	8.2	0.0
Incr Delay (d2), s/veh	1.3	2.8	2.1	2.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.1	8.4	8.7	9.0	1.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.8	19.3	18.5	18.4	8.6	0.0
LnGrp LOS	B	B	B	B	A	A
Approach Vol, veh/h		944	964		139	
Approach Delay, s/veh		18.5	18.5		8.6	
Approach LOS		B	B		A	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			25.1		32.9	25.1
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			28.5		20.5	28.5
Max Q Clear Time (g_c+I1), s			15.8		4.6	15.3
Green Ext Time (p_c), s			4.8		0.3	5.0

Intersection Summary		
HCM 6th Ctrl Delay	17.8	
HCM 6th LOS	B	

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	956	896	14	58	10
Future Vol, veh/h	1	956	896	14	58	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	1	1017	953	15	62	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	968	0	-	0	1472	484
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	511	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	714	-	-	-	120	534
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	573	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	714	-	-	-	120	534
Mov Cap-2 Maneuver	-	-	-	-	120	-
Stage 1	-	-	-	-	336	-
Stage 2	-	-	-	-	573	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	58.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	714	-	-	-	135
HCM Lane V/C Ratio	0.001	-	-	-	0.536
HCM Control Delay (s)	10.1	0	-	-	58.9
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	808	55	71	735	234	29	98	74	189	64	132
Future Volume (veh/h)	141	808	55	71	735	234	29	98	74	189	64	132
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	0.99		0.96	0.99		0.97
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	1885	1885	1885	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	147	842	57	74	766	0	30	102	77	197	67	138
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	185	1559	106	101	1474		285	269	182	347	321	278
Arrive On Green	0.10	0.46	0.46	0.06	0.41	0.00	0.03	0.13	0.13	0.08	0.18	0.18
Sat Flow, veh/h	1795	3404	230	1795	3676	0	1810	2015	1368	1795	1791	1555
Grp Volume(v), veh/h	147	443	456	74	766	0	30	90	89	197	67	138
Grp Sat Flow(s),veh/h/ln	1795	1791	1843	1795	1791	0	1810	1805	1578	1795	1791	1555
Q Serve(g_s), s	5.2	11.7	11.7	2.7	10.5	0.0	0.9	3.0	3.4	5.1	2.1	5.2
Cycle Q Clear(g_c), s	5.2	11.7	11.7	2.7	10.5	0.0	0.9	3.0	3.4	5.1	2.1	5.2
Prop In Lane	1.00		0.13	1.00		0.00	1.00		0.87	1.00		1.00
Lane Grp Cap(c), veh/h	185	820	844	101	1474		285	241	211	347	321	278
V/C Ratio(X)	0.79	0.54	0.54	0.73	0.52		0.11	0.37	0.42	0.57	0.21	0.50
Avail Cap(c_a), veh/h	211	820	844	178	1474		365	748	654	347	745	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	12.8	12.8	30.5	14.5	0.0	23.3	25.9	26.1	23.4	23.0	24.3
Incr Delay (d2), s/veh	14.5	2.5	2.5	3.7	1.3	0.0	0.1	0.4	0.5	1.4	0.1	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(95%),veh/ln	5.2	8.1	8.2	2.1	7.2	0.0	0.7	2.2	2.2	4.7	1.5	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	15.3	15.3	34.2	15.8	0.0	23.3	26.3	26.6	24.8	23.1	24.8
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		1046			840	A		209			402	
Approach Delay, s/veh		19.2			17.4			26.0			24.5	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	13.3	8.2	34.6	6.6	16.2	11.3	31.5
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	5.1	27.2	6.5	28.2	5.0	27.3	7.7	27.0
Max Q Clear Time (g_c+I1), s	7.1	5.4	4.7	13.7	2.9	7.2	7.2	12.5
Green Ext Time (p_c), s	0.0	0.6	0.0	3.2	0.0	0.8	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	20.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	533	322	0
Future Vol, veh/h	0	4	1	533	322	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	4	1	579	350	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	934	353	353	0	-	0
Stage 1	353	-	-	-	-	-
Stage 2	581	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	297	695	1217	-	-	-
Stage 1	716	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	295	693	1214	-	-	-
Mov Cap-2 Maneuver	418	-	-	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	561	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1214	-	693	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	8	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	13	29	406	332	1
Future Vol, veh/h	4	13	29	406	332	1
Conflicting Peds, #/hr	0	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	4	14	31	432	353	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	850	357	356	0	-	0
Stage 1	356	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	334	692	1214	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	617	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	321	690	1212	-	-	-
Mov Cap-2 Maneuver	442	-	-	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	616	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1212	-	610	-	-
HCM Lane V/C Ratio	0.025	-	0.03	-	-
HCM Control Delay (s)	8	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	0	0	15	1	9
Future Vol, veh/h	3	0	0	15	1	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	0	0	22	1	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	4	0	26	4
Stage 1	-	-	-	-	4	-
Stage 2	-	-	-	-	22	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1631	-	995	1085
Stage 1	-	-	-	-	1024	-
Stage 2	-	-	-	-	1006	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1631	-	995	1085
Mov Cap-2 Maneuver	-	-	-	-	995	-
Stage 1	-	-	-	-	1024	-
Stage 2	-	-	-	-	1006	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1075	-	-	1631	-
HCM Lane V/C Ratio	0.014	-	-	-	-
HCM Control Delay (s)	8.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	0	257	73	0	157
Future Vol, veh/h	12	0	257	73	0	157
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	33	0	2	2	0	0
Mvmt Flow	22	0	476	135	0	291

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	885	594	0	0	661	0
Stage 1	594	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Critical Hdwy	6.73	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	279	509	-	-	937	-
Stage 1	496	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	266	485	-	-	892	-
Mov Cap-2 Maneuver	266	-	-	-	-	-
Stage 1	472	-	-	-	-	-
Stage 2	693	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	266	892	-
HCM Lane V/C Ratio	-	-	0.084	-	-
HCM Control Delay (s)	-	-	19.8	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	333	0	0	163
Future Vol, veh/h	0	0	333	0	0	163
Conflicting Peds, #/hr	0	0	0	50	50	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	0	0	2	0	0	33
Mvmt Flow	0	0	617	0	0	302

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	969	667	0	0	667	0
Stage 1	667	-	-	-	-	-
Stage 2	302	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	284	462	-	-	932	-
Stage 1	514	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	270	440	-	-	888	-
Mov Cap-2 Maneuver	270	-	-	-	-	-
Stage 1	489	-	-	-	-	-
Stage 2	755	-	-	-	-	-

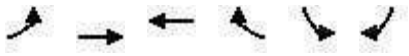
Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	888	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	374	64	426	228	75	32	67	320	47	45	71
Future Volume (veh/h)	191	374	64	426	228	75	32	67	320	47	45	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.97	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1767	1767	1767
Adj Flow Rate, veh/h	225	440	75	501	268	88	38	79	376	55	53	84
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	9	9	9
Cap, veh/h	534	809	137	579	995	319	360	378	655	216	78	123
Arrive On Green	0.11	0.27	0.27	0.22	0.38	0.38	0.20	0.20	0.20	0.13	0.13	0.13
Sat Flow, veh/h	1767	3006	509	1781	2644	849	1781	1870	1544	1682	605	959
Grp Volume(v), veh/h	225	257	258	501	178	178	38	79	376	55	0	137
Grp Sat Flow(s),veh/h/ln	1767	1763	1752	1781	1777	1716	1781	1870	1544	1682	0	1564
Q Serve(g_s), s	9.9	13.6	13.8	21.1	7.6	7.9	1.9	3.8	20.4	3.2	0.0	9.1
Cycle Q Clear(g_c), s	9.9	13.6	13.8	21.1	7.6	7.9	1.9	3.8	20.4	3.2	0.0	9.1
Prop In Lane	1.00		0.29	1.00		0.49	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	534	474	472	579	668	646	360	378	655	216	0	201
V/C Ratio(X)	0.42	0.54	0.55	0.87	0.27	0.28	0.11	0.21	0.57	0.25	0.00	0.68
Avail Cap(c_a), veh/h	583	474	472	666	668	646	360	378	655	417	0	388
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.1	34.1	34.1	21.2	23.6	23.7	35.5	36.2	24.3	42.8	0.0	45.3
Incr Delay (d2), s/veh	0.2	4.4	4.5	9.5	1.0	1.1	0.0	0.1	0.8	0.2	0.0	1.5
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(95%),veh/ln	7.3	10.4	10.5	14.9	5.9	6.0	1.5	3.1	11.8	2.5	0.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.3	38.4	38.7	30.6	24.5	24.7	35.5	36.3	25.1	43.0	0.0	46.9
LnGrp LOS	C	D	D	C	C	C	D	D	C	D	A	D
Approach Vol, veh/h		740			857			493			192	
Approach Delay, s/veh		34.2			28.1			27.7			45.8	
Approach LOS		C			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0	28.6	34.3		19.0	17.0	46.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	29.0	27.0		27.0	15.0	41.0				
Max Q Clear Time (g_c+I1), s		22.4	23.1	15.8		11.1	11.9	9.9				
Green Ext Time (p_c), s		0.0	0.5	1.5		0.5	0.1	1.3				

Intersection Summary	
HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	732	719	76	50	10
Future Volume (veh/h)	40	732	719	76	50	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1781	1781
Adj Flow Rate, veh/h	43	779	765	81	53	11
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	8	8
Cap, veh/h	195	1401	1393	147	276	57
Arrive On Green	0.43	0.43	0.43	0.43	0.20	0.20
Sat Flow, veh/h	78	3347	3336	343	1356	281
Grp Volume(v), veh/h	429	393	419	427	65	0
Grp Sat Flow(s),veh/h/ln	1724	1617	1777	1809	1663	0
Q Serve(g_s), s	0.0	4.5	4.3	4.3	0.8	0.0
Cycle Q Clear(g_c), s	4.2	4.5	4.3	4.3	0.8	0.0
Prop In Lane	0.10			0.19	0.82	0.17
Lane Grp Cap(c), veh/h	902	695	763	777	339	0
V/C Ratio(X)	0.48	0.57	0.55	0.55	0.19	0.00
Avail Cap(c_a), veh/h	1380	1186	1303	1326	1220	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.2	5.3	5.2	5.2	8.1	0.0
Incr Delay (d2), s/veh	0.4	0.7	0.6	0.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	1.0	1.0	1.0	0.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.6	6.0	5.8	5.8	8.4	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		822	846		65	
Approach Delay, s/veh		5.8	5.8		8.4	
Approach LOS		A	A		A	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		15.0		9.5	15.0
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		18.0		18.0	18.0
Max Q Clear Time (g_c+I1), s		6.5		2.8	6.3
Green Ext Time (p_c), s		4.0		0.1	4.1

Intersection Summary	
HCM 6th Ctrl Delay	5.9
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	750	776	71	0	20
Future Vol, veh/h	0	750	776	71	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	0	833	862	79	0	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	471
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	545
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	545
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	545
HCM Lane V/C Ratio	-	-	-	0.041
HCM Control Delay (s)	-	-	-	11.9
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	721	837	124	104	11
Future Volume (veh/h)	30	721	837	124	104	11
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	34	829	962	143	120	13
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	162	1676	1575	234	282	31
Arrive On Green	0.51	0.51	0.51	0.51	0.18	0.18
Sat Flow, veh/h	51	3387	3197	461	1602	174
Grp Volume(v), veh/h	449	414	551	554	134	0
Grp Sat Flow(s),veh/h/ln	1736	1617	1777	1787	1789	0
Q Serve(g_s), s	0.0	4.8	6.3	6.3	1.9	0.0
Cycle Q Clear(g_c), s	4.4	4.8	6.3	6.3	1.9	0.0
Prop In Lane	0.08			0.26	0.90	0.10
Lane Grp Cap(c), veh/h	1017	821	902	907	314	0
V/C Ratio(X)	0.44	0.50	0.61	0.61	0.43	0.00
Avail Cap(c_a), veh/h	1459	1279	1406	1414	1164	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.5	4.6	5.0	5.0	10.4	0.0
Incr Delay (d2), s/veh	0.3	0.5	0.7	0.7	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	1.0	1.4	1.4	1.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.8	5.1	5.7	5.7	11.4	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		863	1105		134	
Approach Delay, s/veh		5.0	5.7		11.4	
Approach LOS		A	A		B	

Timer - Assigned Phs				4		6	8
Phs Duration (G+Y+Rc), s				18.9		9.5	18.9
Change Period (Y+Rc), s				4.5		4.5	4.5
Max Green Setting (Gmax), s				22.5		18.5	22.5
Max Q Clear Time (g_c+I1), s				6.8		3.9	8.3
Green Ext Time (p_c), s				5.1		0.3	6.1

Intersection Summary							
HCM 6th Ctrl Delay			5.7				
HCM 6th LOS			A				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	708	25	17	778	62	27	26	30	232	60	157
Future Volume (veh/h)	92	708	25	17	778	62	27	26	30	232	60	157
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		0.98	0.98		0.98
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	1870	1870	1870	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	100	770	27	18	846	0	29	28	33	252	65	171
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	128	1686	59	38	1531		191	211	184	384	319	279
Arrive On Green	0.07	0.48	0.48	0.02	0.43	0.00	0.03	0.12	0.12	0.09	0.18	0.18
Sat Flow, veh/h	1781	3502	123	1781	3647	0	1795	1791	1561	1795	1791	1564
Grp Volume(v), veh/h	100	391	406	18	846	0	29	28	33	252	65	171
Grp Sat Flow(s),veh/h/ln	1781	1777	1848	1781	1777	0	1795	1791	1561	1795	1791	1564
Q Serve(g_s), s	3.5	9.2	9.2	0.6	11.1	0.0	0.0	0.9	1.2	0.4	1.9	6.3
Cycle Q Clear(g_c), s	3.5	9.2	9.2	0.6	11.1	0.0	0.0	0.9	1.2	0.4	1.9	6.3
Prop In Lane	1.00		0.07	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	128	855	890	38	1531		191	211	184	384	319	279
V/C Ratio(X)	0.78	0.46	0.46	0.47	0.55		0.15	0.13	0.18	0.66	0.20	0.61
Avail Cap(c_a), veh/h	185	855	890	142	1531		278	812	708	384	815	711
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	10.8	10.8	30.3	13.3	0.0	29.0	24.8	24.9	24.8	22.0	23.8
Incr Delay (d2), s/veh	7.2	1.8	1.7	3.3	1.4	0.0	0.1	0.1	0.2	3.3	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.9	6.1	6.3	0.5	7.3	0.0	0.7	0.6	0.8	6.5	1.4	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	12.6	12.5	33.6	14.8	0.0	29.2	24.9	25.1	28.1	22.1	24.6
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		897			864	A		90			488	
Approach Delay, s/veh		15.1			15.1			26.3			26.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	11.9	5.8	34.7	6.5	15.7	9.0	31.5
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	5.1	28.4	5.0	28.5	5.0	28.5	6.5	27.0
Max Q Clear Time (g_c+I1), s	2.4	3.2	2.6	11.2	2.0	8.3	5.5	13.1
Green Ext Time (p_c), s	0.1	0.2	0.0	2.9	0.0	0.9	0.0	3.4

Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	180	456	0
Future Vol, veh/h	0	2	2	180	456	0
Conflicting Peds, #/hr	0	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	4	1	0
Mvmt Flow	0	2	2	191	485	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	686	492	491	0	-	0
Stage 1	491	-	-	-	-	-
Stage 2	195	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	416	581	1083	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	843	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	410	577	1077	-	-	-
Mov Cap-2 Maneuver	500	-	-	-	-	-
Stage 1	614	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1077	-	577	-	-
HCM Lane V/C Ratio	0.002	-	0.004	-	-
HCM Control Delay (s)	8.3	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	13	134	420	6
Future Vol, veh/h	0	5	13	134	420	6
Conflicting Peds, #/hr	0	1	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	6	15	152	477	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	668	487	489	0	-	0
Stage 1	486	-	-	-	-	-
Stage 2	182	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	423	581	1074	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	849	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	412	578	1069	-	-	-
Mov Cap-2 Maneuver	498	-	-	-	-	-
Stage 1	606	-	-	-	-	-
Stage 2	845	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1069	-	578	-	-
HCM Lane V/C Ratio	0.014	-	0.01	-	-
HCM Control Delay (s)	8.4	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	0	13	4	0	2
Future Vol, veh/h	1	0	13	4	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	54	54	54	54	54	54
Heavy Vehicles, %	17	0	0	0	0	2
Mvmt Flow	2	0	24	7	0	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2	0	57	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	55	-
Critical Hdwy	-	-	4.1	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1634	-	955	1082
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	973	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1634	-	941	1082
Mov Cap-2 Maneuver	-	-	-	-	941	-
Stage 1	-	-	-	-	1026	-
Stage 2	-	-	-	-	958	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.5	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1082	-	-	1634	-
HCM Lane V/C Ratio	0.003	-	-	0.015	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	17	0	110	3	0	126
Future Vol, veh/h	17	0	110	3	0	126
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	27	0	175	5	0	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	398	198	0	0	200	0
Stage 1	198	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	611	848	-	-	1384	-
Stage 1	840	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	599	832	-	-	1358	-
Mov Cap-2 Maneuver	599	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	599	1358	-
HCM Lane V/C Ratio	-	-	0.045	-	-
HCM Control Delay (s)	-	-	11.3	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	113	0	0	143
Future Vol, veh/h	0	0	113	0	0	143
Conflicting Peds, #/hr	0	0	0	20	20	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	153	0	0	193

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	366	173	0	0	173	0
Stage 1	173	-	-	-	-	-
Stage 2	193	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	638	876	-	-	1416	-
Stage 1	862	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	626	859	-	-	1389	-
Mov Cap-2 Maneuver	626	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	845	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1389	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	461	42	348	563	37	77	18	320	65	24	56
Future Volume (veh/h)	65	461	42	348	563	37	77	18	320	65	24	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	70	496	45	374	605	40	83	19	344	70	26	60
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	311	778	70	446	1221	81	628	659	812	137	38	88
Arrive On Green	0.04	0.23	0.23	0.17	0.36	0.36	0.35	0.35	0.35	0.08	0.08	0.08
Sat Flow, veh/h	1795	3315	300	1795	3409	225	1795	1885	1567	1795	498	1149
Grp Volume(v), veh/h	70	267	274	374	317	328	83	19	344	70	0	86
Grp Sat Flow(s),veh/h/ln	1795	1791	1824	1795	1791	1843	1795	1885	1567	1795	0	1647
Q Serve(g_s), s	3.4	15.4	15.5	17.6	15.9	16.0	3.6	0.8	15.7	4.3	0.0	5.9
Cycle Q Clear(g_c), s	3.4	15.4	15.5	17.6	15.9	16.0	3.6	0.8	15.7	4.3	0.0	5.9
Prop In Lane	1.00		0.16	1.00		0.12	1.00		1.00	1.00		0.70
Lane Grp Cap(c), veh/h	311	420	428	446	642	660	628	659	812	137	0	126
V/C Ratio(X)	0.23	0.64	0.64	0.84	0.49	0.50	0.13	0.03	0.42	0.51	0.00	0.68
Avail Cap(c_a), veh/h	314	420	428	446	642	660	628	659	812	422	0	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.3	39.6	39.6	27.0	28.8	28.8	25.5	24.6	17.3	51.0	0.0	51.8
Incr Delay (d2), s/veh	0.1	7.1	7.1	10.2	2.2	2.1	0.4	0.1	1.6	1.1	0.0	2.4
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(95%),veh/ln	2.6	12.0	12.3	12.8	11.0	11.3	2.9	0.6	9.8	3.6	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.5	46.7	46.8	37.2	30.9	30.9	25.9	24.6	19.0	52.1	0.0	54.2
LnGrp LOS	C	D	D	D	C	C	C	C	B	D	A	D
Approach Vol, veh/h		611			1019			446			156	
Approach Delay, s/veh		45.0			33.2			20.5			53.3	
Approach LOS		D			C			C			D	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		45.2	24.0	32.0		13.8	9.8	46.2				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		22.0	19.0	27.0		27.0	5.0	41.0				
Max Q Clear Time (g_c+I1), s		17.7	19.6	17.5		7.9	5.4	18.0				
Green Ext Time (p_c), s		0.4	0.0	1.5		0.4	0.0	2.4				

Intersection Summary												
HCM 6th Ctrl Delay			35.3									
HCM 6th LOS			D									

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	853	947	6	88	19
Future Volume (veh/h)	5	853	947	6	88	19
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	5	889	986	6	92	20
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	143	1597	1666	10	280	61
Arrive On Green	0.46	0.46	0.46	0.46	0.19	0.19
Sat Flow, veh/h	5	3585	3744	22	1442	314
Grp Volume(v), veh/h	479	415	484	508	113	0
Grp Sat Flow(s),veh/h/ln	1874	1630	1791	1881	1771	0
Q Serve(g_s), s	0.0	4.8	5.2	5.2	1.4	0.0
Cycle Q Clear(g_c), s	4.8	4.8	5.2	5.2	1.4	0.0
Prop In Lane	0.01			0.01	0.81	0.18
Lane Grp Cap(c), veh/h	997	744	817	859	344	0
V/C Ratio(X)	0.48	0.56	0.59	0.59	0.33	0.00
Avail Cap(c_a), veh/h	1443	1139	1252	1315	1238	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.1	5.1	5.2	5.2	8.9	0.0
Incr Delay (d2), s/veh	0.4	0.7	0.7	0.7	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.1	1.0	1.2	1.2	0.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.5	5.8	5.9	5.9	9.5	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		894	992		113	
Approach Delay, s/veh		5.6	5.9		9.5	
Approach LOS		A	A		A	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		16.3		9.5	16.3
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		18.0		18.0	18.0
Max Q Clear Time (g_c+I1), s		6.8		3.4	7.2
Green Ext Time (p_c), s		4.2		0.2	4.6

Intersection Summary	
HCM 6th Ctrl Delay	6.0
HCM 6th LOS	A

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	940	907	9	0	40
Future Vol, veh/h	0	940	907	9	0	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	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	989	955	9	0	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	964	0	-	0	1455	482
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	495	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	716	-	-	-	123	536
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	584	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	716	-	-	-	123	536
Mov Cap-2 Maneuver	-	-	-	-	123	-
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	584	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	716	-	-	-	536
HCM Lane V/C Ratio	-	-	-	-	0.079
HCM Control Delay (s)	0	-	-	-	12.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	911	896	14	104	10
Future Volume (veh/h)	4	911	896	14	104	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1900	1900
Adj Flow Rate, veh/h	4	969	953	15	111	11
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	142	1604	1652	26	313	31
Arrive On Green	0.46	0.46	0.46	0.46	0.19	0.19
Sat Flow, veh/h	3	3590	3703	57	1616	160
Grp Volume(v), veh/h	521	452	473	495	123	0
Grp Sat Flow(s),veh/h/ln	1878	1630	1791	1875	1790	0
Q Serve(g_s), s	0.0	5.4	5.0	5.0	1.5	0.0
Cycle Q Clear(g_c), s	5.3	5.4	5.0	5.0	1.5	0.0
Prop In Lane	0.01			0.03	0.90	0.09
Lane Grp Cap(c), veh/h	1000	746	820	858	347	0
V/C Ratio(X)	0.52	0.61	0.58	0.58	0.35	0.00
Avail Cap(c_a), veh/h	1444	1136	1249	1307	1248	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.2	5.3	5.2	5.2	9.0	0.0
Incr Delay (d2), s/veh	0.4	0.8	0.6	0.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.2	1.2	1.2	1.2	0.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.7	6.0	5.8	5.8	9.6	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		973	968		123	
Approach Delay, s/veh		5.8	5.8		9.6	
Approach LOS		A	A		A	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		16.3		9.5	16.3
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		18.0		18.0	18.0
Max Q Clear Time (g_c+I1), s		7.4		3.5	7.0
Green Ext Time (p_c), s		4.4		0.3	4.5

Intersection Summary	
HCM 6th Ctrl Delay	6.0
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	808	55	71	735	234	29	98	74	189	64	132
Future Volume (veh/h)	141	808	55	71	735	234	29	98	74	189	64	132
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	0.99		0.96	0.99		0.97
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	1885	1885	1885	1885	1885	1885	1900	1900	1900	1885	1885	1885
Adj Flow Rate, veh/h	147	842	57	74	766	0	30	102	77	197	67	138
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	185	1559	106	101	1474		285	269	182	347	321	278
Arrive On Green	0.10	0.46	0.46	0.06	0.41	0.00	0.03	0.13	0.13	0.08	0.18	0.18
Sat Flow, veh/h	1795	3404	230	1795	3676	0	1810	2015	1368	1795	1791	1555
Grp Volume(v), veh/h	147	443	456	74	766	0	30	90	89	197	67	138
Grp Sat Flow(s),veh/h/ln	1795	1791	1843	1795	1791	0	1810	1805	1578	1795	1791	1555
Q Serve(g_s), s	5.2	11.7	11.7	2.7	10.5	0.0	0.9	3.0	3.4	5.1	2.1	5.2
Cycle Q Clear(g_c), s	5.2	11.7	11.7	2.7	10.5	0.0	0.9	3.0	3.4	5.1	2.1	5.2
Prop In Lane	1.00		0.13	1.00		0.00	1.00		0.87	1.00		1.00
Lane Grp Cap(c), veh/h	185	820	844	101	1474		285	241	211	347	321	278
V/C Ratio(X)	0.79	0.54	0.54	0.73	0.52		0.11	0.37	0.42	0.57	0.21	0.50
Avail Cap(c_a), veh/h	211	820	844	178	1474		365	748	654	347	745	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	12.8	12.8	30.5	14.5	0.0	23.3	25.9	26.1	23.4	23.0	24.3
Incr Delay (d2), s/veh	14.5	2.5	2.5	3.7	1.3	0.0	0.1	0.4	0.5	1.4	0.1	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(95%),veh/ln	5.2	8.1	8.2	2.1	7.2	0.0	0.7	2.2	2.2	4.7	1.5	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	15.3	15.3	34.2	15.8	0.0	23.3	26.3	26.6	24.8	23.1	24.8
LnGrp LOS	D	B	B	C	B		C	C	C	C	C	C
Approach Vol, veh/h		1046			840	A		209			402	
Approach Delay, s/veh		19.2			17.4			26.0			24.5	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	13.3	8.2	34.6	6.6	16.2	11.3	31.5
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	5.1	27.2	6.5	28.2	5.0	27.3	7.7	27.0
Max Q Clear Time (g_c+I1), s	7.1	5.4	4.7	13.7	2.9	7.2	7.2	12.5
Green Ext Time (p_c), s	0.0	0.6	0.0	3.2	0.0	0.8	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	20.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	533	322	0
Future Vol, veh/h	0	4	1	533	322	0
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	4	1	579	350	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	934	353	353	0	-	0
Stage 1	353	-	-	-	-	-
Stage 2	581	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	297	695	1217	-	-	-
Stage 1	716	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	295	693	1214	-	-	-
Mov Cap-2 Maneuver	418	-	-	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	561	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1214	-	693	-	-
HCM Lane V/C Ratio	0.001	-	0.006	-	-
HCM Control Delay (s)	8	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	13	29	406	332	1
Future Vol, veh/h	4	13	29	406	332	1
Conflicting Peds, #/hr	0	1	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	4	14	31	432	353	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	850	357	356	0	-	0
Stage 1	356	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	334	692	1214	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	617	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	321	690	1212	-	-	-
Mov Cap-2 Maneuver	442	-	-	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	616	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1212	-	610	-	-
HCM Lane V/C Ratio	0.025	-	0.03	-	-
HCM Control Delay (s)	8	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	0	0	15	1	9
Future Vol, veh/h	3	0	0	15	1	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	0	0	22	1	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	4	0	26	4
Stage 1	-	-	-	-	4	-
Stage 2	-	-	-	-	22	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1631	-	995	1085
Stage 1	-	-	-	-	1024	-
Stage 2	-	-	-	-	1006	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1631	-	995	1085
Mov Cap-2 Maneuver	-	-	-	-	995	-
Stage 1	-	-	-	-	1024	-
Stage 2	-	-	-	-	1006	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1075	-	-	1631	-
HCM Lane V/C Ratio	0.014	-	-	-	-
HCM Control Delay (s)	8.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	732	719	76	50	10
Future Vol, veh/h	40	732	719	76	50	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	8	8
Mvmt Flow	43	779	765	81	53	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	846	0	-	0	1282	423
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	476	-
Critical Hdwy	4.14	-	-	-	6.96	7.06
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	2.22	-	-	-	3.58	3.38
Pot Cap-1 Maneuver	787	-	-	-	149	563
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	574	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	787	-	-	-	135	563
Mov Cap-2 Maneuver	-	-	-	-	254	-
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	574	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	21
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	787	-	-	-	254	563
HCM Lane V/C Ratio	0.054	-	-	-	0.209	0.019
HCM Control Delay (s)	9.8	0.4	-	-	22.9	11.5
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.8	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	750	776	71	0	20
Future Vol, veh/h	0	750	776	71	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	0	833	862	79	0	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	471
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	545
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	545
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	545
HCM Lane V/C Ratio	-	-	-	0.041
HCM Control Delay (s)	-	-	-	11.9
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	721	837	124	104	11
Future Vol, veh/h	30	721	837	124	104	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	34	829	962	143	120	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1105	0	-	0	1517	553
Stage 1	-	-	-	-	1034	-
Stage 2	-	-	-	-	483	-
Critical Hdwy	4.14	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.22	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	628	-	-	-	~ 112	482
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	592	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	628	-	-	-	~ 101	482
Mov Cap-2 Maneuver	-	-	-	-	210	-
Stage 1	-	-	-	-	277	-
Stage 2	-	-	-	-	592	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	39.7
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	628	-	-	-	210	482
HCM Lane V/C Ratio	0.055	-	-	-	0.569	0.026
HCM Control Delay (s)	11.1	0.5	-	-	42.6	12.7
HCM Lane LOS	B	A	-	-	E	B
HCM 95th %tile Q(veh)	0.2	-	-	-	3.1	0.1

Notes

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

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	853	947	6	88	19
Future Vol, veh/h	5	853	947	6	88	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	5	889	986	6	92	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	992	0	-	0	1444	496
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	455	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	699	-	-	-	125	525
Stage 1	-	-	-	-	325	-
Stage 2	-	-	-	-	611	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	699	-	-	-	123	525
Mov Cap-2 Maneuver	-	-	-	-	240	-
Stage 1	-	-	-	-	320	-
Stage 2	-	-	-	-	611	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	26
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	699	-	-	-	240	525
HCM Lane V/C Ratio	0.007	-	-	-	0.382	0.038
HCM Control Delay (s)	10.2	0.1	-	-	29	12.1
HCM Lane LOS	B	A	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	1.7	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	940	907	9	0	40
Future Vol, veh/h	0	940	907	9	0	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	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	0	989	955	9	0	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	482
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	-	0	536
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	536
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	536
HCM Lane V/C Ratio	-	-	-	0.079
HCM Control Delay (s)	-	-	-	12.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.3

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	911	896	14	104	10
Future Vol, veh/h	4	911	896	14	104	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	4	969	953	15	111	11

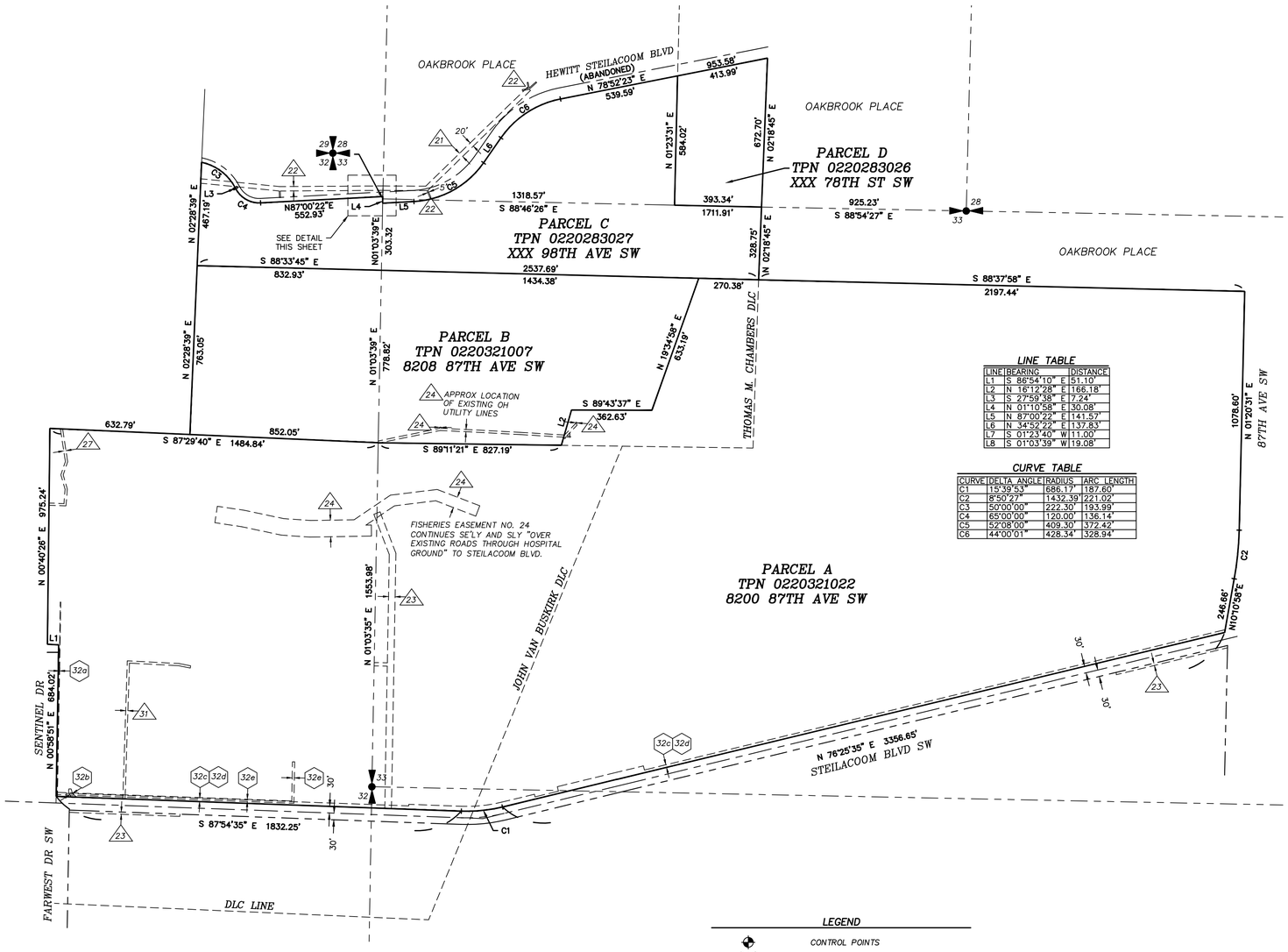
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	968	0	-	0	1454	484
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	493	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	714	-	-	-	123	534
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	585	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	714	-	-	-	122	534
Mov Cap-2 Maneuver	-	-	-	-	244	-
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	585	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	29.7
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	714	-	-	-	244	534
HCM Lane V/C Ratio	0.006	-	-	-	0.453	0.02
HCM Control Delay (s)	10.1	0.1	-	-	31.4	11.9
HCM Lane LOS	B	A	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	2.2	0.1

Appendix 4: Property Survey

TOPOGRAPHIC SURVEY
IN
SECTION 28, 29, 32, & 33, TOWNSHIP 20N, RANGE 2 EAST, W.M.



LINE TABLE

LINE	BEARING	DISTANCE
L1	S 86°54'10" E	51.10'
L2	N 16°12'28" E	166.18'
L3	S 27°59'38" E	7.24'
L4	N 01°10'58" E	30.08'
L5	N 87°00'22" E	141.57'
L6	N 34°52'22" E	137.83'
L7	S 01°23'40" W	11.00'
L8	S 01°03'39" W	19.08'

CURVE TABLE

CURVE	DELTA ANGLE	RADIUS	ARC LENGTH
C1	15°39'53"	686.17'	187.60'
C2	8°50'27"	1432.39'	221.02'
C3	50°00'00"	222.30'	193.99'
C4	65°00'00"	120.00'	136.14'
C5	52°08'00"	409.30'	372.42'
C6	44°00'01"	428.34'	328.94'

LEGAL DESCRIPTION AND RECORD DOCUMENTS:

PER STEWART TITLE GUARANTY COMPANY TITLE REPORT ORDER NO. 765139RT, DATED DECEMBER 6, 2019.

△# DENOTES ITEM PER SCHEDULE B, PART II EXCEPTIONS OF TITLE REPORT IS PLOTTED HEREON, OTHERWISE ITEM IS NOT PLOTTABLE OR IS BLANKET IN NATURE.

ITEM	DATE	RECORDING NO.	PURPOSE
17	11-25-1912	371622	WAIVER OF CLAIM FOR DAMAGES AND CONSENT TO LOCATE ROAD AND THE TERMS AND CONDITIONS THEREOF.
18	9-18-1914	410088	RESERVATIONS AND OTHER MATERS CONTAINED IN DEED.
19	10-2-1914	410089	RESERVATIONS AND OTHER MATERS CONTAINED IN DEED.
20	12-17-1919	545124	RESERVATIONS AND OTHER MATERS CONTAINED IN DEED.
△21	8-15-1951	1602314	EASEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO THE CITY OF TACOMA FOR 20 FOOT WIDE ACCESS ROAD, ANCHOR, GUY WIRES, AND THE RIGHT TO CUT AND TRIM TREES AFFECTING GRANTEE'S FACILITIES. DESCRIPTION CONTAINED IN DOCUMENT IS INSUFFICIENT TO PLOT HEREON. APPROX LOCATION OF EXISTING UTILITY LINES SHOWN HEREON.
△22	7-24-1967	2198758	EASEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO THE CITY OF TACOMA FOR DISTRIBUTION AND TRANSMISSION LINES.
△23	7-24-1967	2198758	EASEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO PIERCE COUNTY FOR A RIGHT-OF-WAY FOR PUBLIC ROAD FACILITIES (STORM SEWER MAIN AND AUXILIARY LINE AND "HOLDING LANES").
△24	7-13-1973	2510380	EASEMENT AGREEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO CITY OF TACOMA FOR TRANSMISSION LINE, ANCHORS, AND GUY WIRES. EXACT LOCATION COULD NOT BE DETERMINED FROM DOCUMENT. APPROX AS-BUILT LOCATION SHOWN HEREON.
△25	7-24-1975	2615674	EASEMENT AGREEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO STATE OF WASHINGTON DEPARTMENT OF FISHERIES FOR SALMON REARING FACILITY. EXHIBIT MAPS CONTAINED IN DOCUMENT ARE INSUFFICIENT TO PLOT EXACT LOCATION OF FACILITIES. APPROX LOCATION SHOWN HEREON.
26	8-28-1975	2621947	EASEMENT AGREEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO BOISE CASCADE COMPANY FOR AN ACCESS ROUTE. LOCATION OF EASEMENT IS DESCRIBED AS THE "WEST 60 FEET OF THE WESTERN STATE HOSPITAL GROUNDS FROM STEILACOOM BOULEVARD ROAD NORTH 1050 FEET." IT IS NOT CLEAR AS TO THE INTENT OF THE EXACT LOCATION AND IS NOT PLOTTED HEREON.
△27	2-24-1978	2801980	EASEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO BOISE CASCADE CORPORATION FOR UNDERGROUND PIPELINE FOR CARRYING WASTE MATERIAL.
28	1-16-1984	8401160239	MATTERS AS DISCLOSED BY RECORD OF SURVEY.
29	8-7-1997	9708070108	MATTERS AS DISCLOSED BY RECORD OF SURVEY. SURVEY SHOWS FENCES NOT CONFORMING TO THE PROPERTY LINES ALONG THE WESTERLY PORTION OF SUBJECT PROPERTY.
30	11-22-2005	200511225007	MATTERS AS DISCLOSED BY RECORD OF SURVEY.
△31	9-12-2017	201709120549	EASEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO PUGET SOUND ENERGY FOR ONE OR MORE UTILITY SYSTEMS. SAID EASEMENT IS A CORRECTION OF INSTRUMENT RECORDED UNDER RECORDING NO. 201610270684.
32	1-9-2018	201801095001	ALL COVENANTS, CONDITIONS, RESTRICTIONS, RESERVATIONS, EASEMENTS, OR OTHER SERVITUDES, IF ANY, BUT OMITTING RESTRICTIONS, IF ANY, BASED UPON RACE, COLOR, CREED OR NATIONAL ORIGIN, DISCLOSED BY CITY OF LAKEWOOD BOUNDARY LINE ADJUSTMENT LU17-00179. THIS SURVEY SHOWS THE FOLLOWING EASEMENTS (LISTED BELOW) WHICH ARE NOT CONTAINED IN THE ABOVE MENTIONED TITLE REPORT:

RECORD DOCUMENTS AS SHOWN ON BLA LU17-00179, AF NO. 201801095001, HOWEVER NOT CONTAINED IN SAID TITLE REPORT:

NOTE: THE FOLLOWING EASEMENTS ARE NOT CONTAINED IN THE ABOVE MENTIONED TITLE REPORT, THEREFORE, THE CURRENT STATUS IS UNCERTAIN AT THE TIME OF THIS SURVEY. IT IS RECOMMENDED THE CLIENT OBTAIN THE SERVICES OF THE TITLE COMPANY TO REVIEW AND VERIFY THE CURRENT STATUS OF THESE EASEMENTS.

⬡32a	6-19-2007	200706190184	EASEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO QWEST FOR TELECOMMUNICATIONS FACILITIES.
⬡32b	4-21-2010	201004210386	EASEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO CITY OF LAKEWOOD FOR ROAD IMPROVEMENTS.
⬡32c	1-11-2007	200701110073	EASEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO CITY OF LAKEWOOD FOR POWER FACILITIES. NOTE: IT IS BELIEVED THE LEGAL DESCRIPTION AND EXHIBIT MAP CONTAINED IN DOCUMENT CONTAINS MATHEMATICAL ERRORS. APPROX LOCATION SHOWN HEREON.
⬡32d	1-24-2007	200701240256	EASEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO CITY OF LAKEWOOD FOR POWER FACILITIES. NOTE: IT IS BELIEVED THE LEGAL DESCRIPTION AND EXHIBIT MAP CONTAINED IN DOCUMENT CONTAINS MATHEMATICAL ERRORS. APPROX LOCATION SHOWN HEREON.
⬡32e	1-26-2007	200701261096	EASEMENT AND THE TERMS AND CONDITIONS THEREOF GRANTED TO PUGET SOUND ENERGY FOR ONE OR MORE UTILITY SYSTEMS.

NOTE: THE UNDERSIGNED SURVEYOR EXPRESSES NO LEGAL OPINION REGARDING THE STATUS OR ENCROACHMENTS OF THE ABOVE LISTED DOCUMENTS, EXPRESSES NO LEGAL OPINION REGARDING LEGAL LANGUAGE, TERMS AND CONDITIONS, AGREEMENT PERIODS OR EXPIRATIONS, OR ANY OTHER NON-SURVEY RELATED MATTERS CONTAINED IN SAID DOCUMENTS, AND ALSO EXPRESSES NO LEGAL OPINION AS TO THE OWNERSHIP OR NATURE OF ANY POTENTIAL ENCROACHMENTS SHOWN HEREON. ALL ITEMS LISTED ABOVE ARE SURVEY RELATED MATTERS ONLY. DEEDS OF TRUST, PROPERTY TAX INFORMATION, MORTGAGES AND OTHER FINANCIAL DOCUMENTS, AND OTHER NON-SURVEY RELATED MATTERS CONTAINED IN TITLE REPORT ARE NOT A PART OF THIS SURVEY.

METHOD OF SURVEY

CONTROL SURVEY PERFORMED USING RTK METHODS WITH THE USE OF TOPCON GR5 GPS RECEIVERS. ON-SITE SURVEY PERFORMED USING CONVENTIONAL FIELD TRAVERSE METHODS WITH THE USE OF A TOPCON PS-103 TOTAL STATION.

THIS SURVEY MEETS OR EXCEEDS THOSE STANDARDS CONTAINED IN WAC 332-130-090.

BASIS OF BEARINGS

WASHINGTON STATE PLANE COORDINATES, SOUTH ZONE 4602, NAD 83/91

ALL DISTANCES ARE GROUND SCALE IN U.S. SURVEY FEET.

0 300 600 900

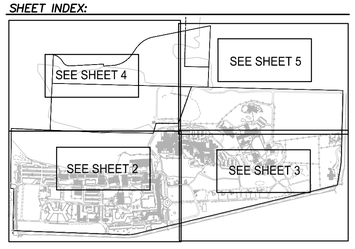
SCALE 1" = 300'

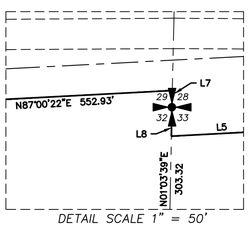
WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE 4602, NAD 83/91

LEGEND

- CONTROL POINTS
- LIGHT POLE
- CATCH BASIN
- WHEEL STOP
- PROPERTY LINE
- CENTER LINE
- RIGHT OF WAY
- BUILDING OVERHANG
- FENCE AS NOTED
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- SANITARY SEWER
- STORM DRAIN
- OVERHEAD UTILITY
- GAS LINE
- WATER LINE
- UNDERGROUND POWER
- UNDERGROUND TELECOMMUNICATIONS
- BUILDING HATCH
- CONCRETE HATCH

SHEET INDEX:





DETAIL SCALE 1" = 50'

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THIS MAP IS AN ACCURATE REPRESENTATION MADE BY ME OR UNDER MY DIRECTION.

01/29/2020
DATE

JEREMIE F. CHAPMAN
PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO. 45779

JEREMIE F. CHAPMAN — STATE OF WASHINGTON — 45779 — REGISTERED PROFESSIONAL LAND SURVEYOR — 1/29/2020

kpff
612 Woodland Square Loop SE, Suite 100
Lacey, WA 98503
360.292.7230
www.kpff.com

TOPOGRAPHIC SURVEY

OF A PORTION OF
SEC. 28, 29, 32, & 33
TWP 20 N, R 2 E, W.M.,
AT THE REQUEST OF
WESTERN STATE HOSPITAL

SCALE: 1" = 300'
JOB: 81900132
DATE: 01/29/2020
SHEET 1 OF 5
81900132.DWG

TOPOGRAPHIC SURVEY
IN
SECTION 28, 29, 32, & 33, TOWNSHIP 20N, RANGE 2 EAST, W.M.

0 100 200 300
SCALE 1" = 100'

NOTES
SEE SHEET 1 OF 5 SHEETS FOR THE EASEMENT NOTES AND LEGEND

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 86°54'10" E	51.10'
L2	S 27°59'38" E	7.24'
L3	S 01°23'40" W	11.00'
L4	S 01°03'39" W	19.08'

CURVE TABLE

CURVE	DELTA ANGLE	RADIUS	ARC LENGTH
C1	50°00'00"	222.30'	193.99'
C2	65°00'00"	120.00'	136.14'
C3	52°08'00"	409.30'	372.42'
C4	44°00'01"	428.34'	328.94'
C5	8°50'27"	1432.39'	221.02'
C6	15°39'53"	686.17'	187.60'

SEE SHEET 4

S 89°11'21" E 827.19'

N 00°40'26" E 975.24'

FISHERIES EASEMENT NO. 24 CONTINUES SE'LY AND SLY "OVER EXISTING ROADS THROUGH HOSPITAL GROUND" TO STEILACOOM BLVD.

SETTLERS ST
SENTINEL DR
N 00°58'51" E 684.02'
WEST ST
BRANCH ST
CHAPEL GATE DR
SEQUOIA ST
TOTEM DR
CIRCLE DR
SOUTH ST
PARWEST DR SW
S 87°54'35" E 1832.25'
N 76°25'32" E 531.64'
STEILACOOM BLVD SW

TREE LINE
GRASS
GRAVEL
ASPH
LSCAPE
GREEN HOUSES
WATER

SEE SHEET 3

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THIS MAP IS AN ACCURATE REPRESENTATION MADE BY ME OR UNDER MY DIRECTION.

01/29/2020
DATE

JEREME F. CHAPMAN
PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO. 45779

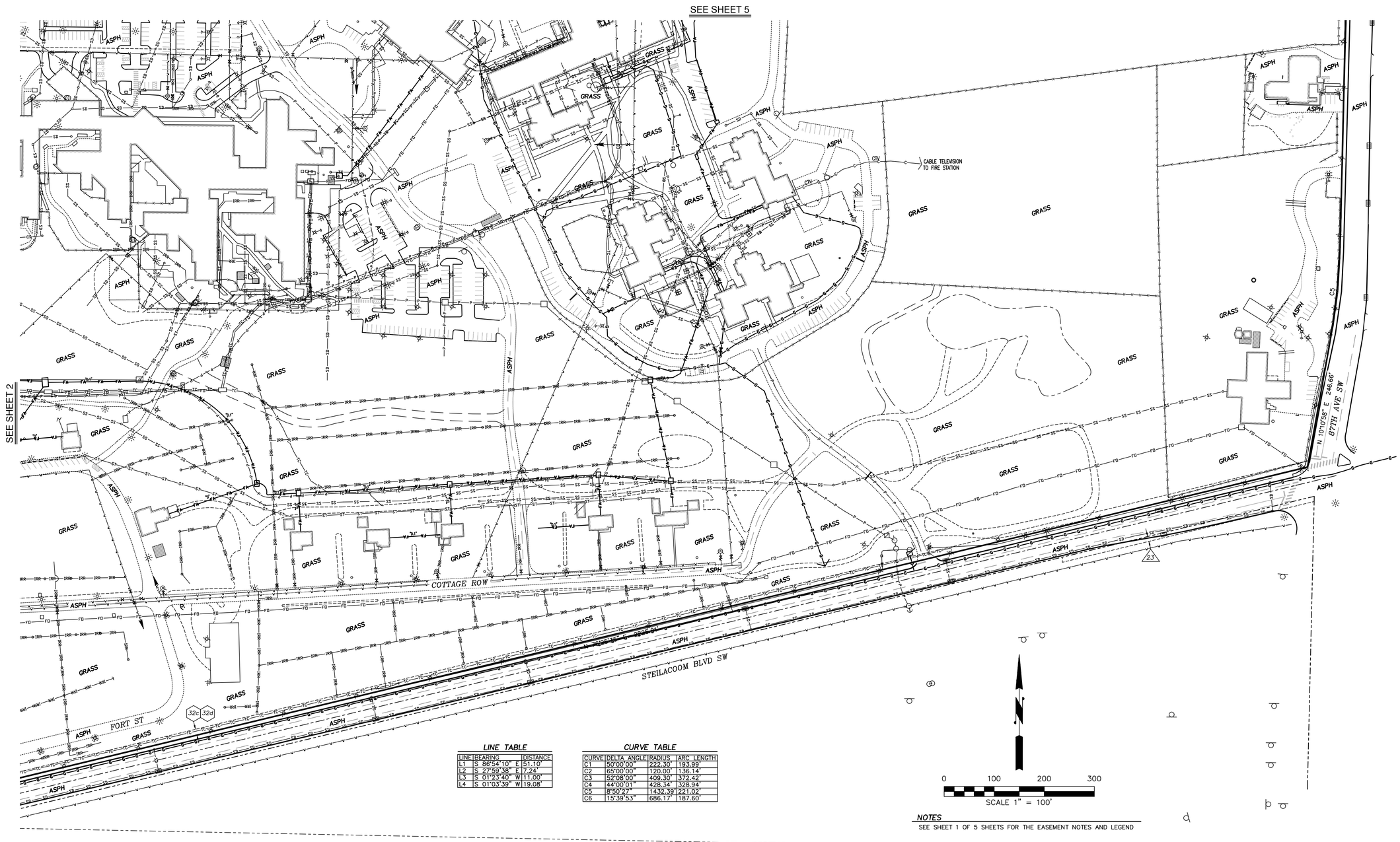
JEREME F. CHAPMAN 45779 REGISTERED PROFESSIONAL LAND SURVEYOR STATE OF WASHINGTON 1/29/2020

kpff
612 Woodland Square Loop SE,
Suite 100
Lacey, WA 98503
360.292.7230
www.kpff.com

TOPOGRAPHIC SURVEY
OF A PORTION OF
SEC. 28, 29, 32, & 33
TWP 20 N, R 2 E, W.M.,
AT THE REQUEST OF
WESTERN STATE HOSPITAL

SCALE: 1" = 100'
JOB: 81900132
DATE: 01/29/2020
SHEET 2 OF 5
81900132.DWG

TOPOGRAPHIC SURVEY
IN
SECTION 28, 29, 32, & 33, TOWNSHIP 20N, RANGE 2 EAST, W.M.



LINE TABLE

LINE	BEARING	DISTANCE
L1	S 86°54'10" E	51.10'
L2	S 27°59'38" E	77.24'
L3	S 01°23'40" W	11.00'
L4	S 01°03'39" W	19.08'

CURVE TABLE

CURVE	DELTA ANGLE	RADIUS	ARC LENGTH
C1	50°00'00"	222.30'	193.99'
C2	65°00'00"	120.00'	136.14'
C3	52°08'00"	409.30'	372.42'
C4	44°00'01"	428.34'	328.94'
C5	8°50'27"	1432.39'	221.02'
C6	15°39'53"	686.17'	187.60'

NOTES

SEE SHEET 1 OF 5 SHEETS FOR THE EASEMENT NOTES AND LEGEND

SURVEYORS CERTIFICATE

I, HEREBY CERTIFY THAT THIS MAP IS AN ACCURATE REPRESENTATION MADE BY ME OR UNDER MY DIRECTION.

01/29/2020
DATE

JEREME F. CHAPMAN
PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO. 45779

JEREME F. CHAPMAN — STATE OF WASHINGTON — 45779 — REGISTERED — PROFESSIONAL LAND SURVEYOR — 1/29/2020

kpff
612 Woodland Square Loop SE,
Suite 100
Lacey, WA 98503
360.292.7230
www.kpff.com

TOPOGRAPHIC SURVEY

OF A PORTION OF
SEC. 28, 29, 32, & 33
TWP 20 N, R 2 E, W.M.,
AT THE REQUEST OF
WESTERN STATE HOSPITAL

SCALE: 1" = 100'
JOB: 81900132
DATE: 01/29/2020
SHEET 3 OF 5
81900132.DWG

TOPOGRAPHIC SURVEY
IN
SECTION 28, 29, 32, & 33, TOWNSHIP 20N, RANGE 2 EAST, W.M.

0 100 200 300

SCALE 1" = 100'

NOTES

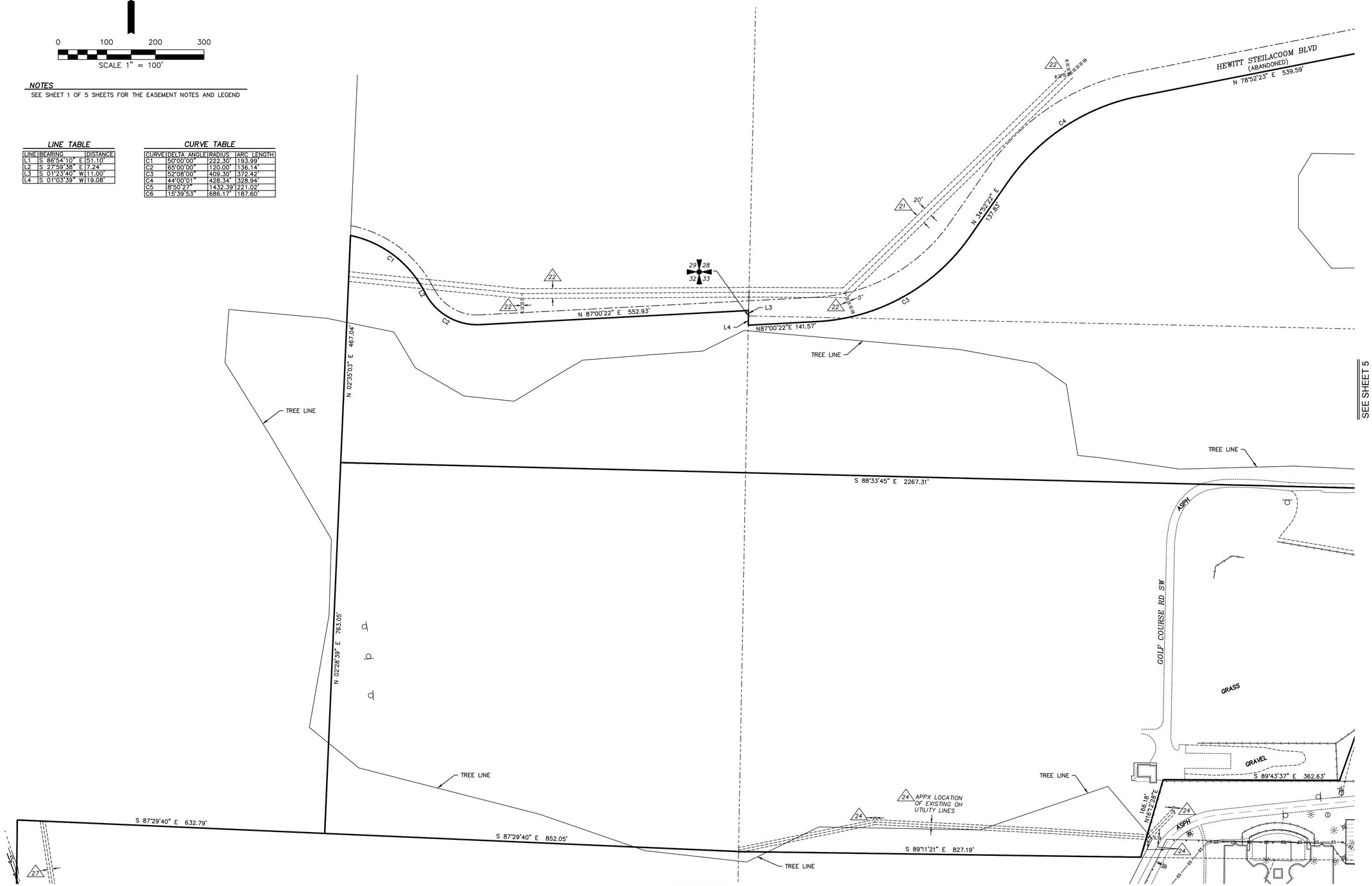
SEE SHEET 1 OF 5 SHEETS FOR THE EASEMENT NOTES AND LEGEND

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 86°54'10" E	51.10'
L2	S 27°59'38" E	7.24'
L3	S 01°23'40" W	11.00'
L4	S 01°03'39" W	19.08'

CURVE TABLE

CURVE	DELTA ANGLE	RADIUS	ARC LENGTH
C1	50°00'00"	222.30'	193.99'
C2	65°00'00"	120.00'	136.14'
C3	52°08'00"	409.30'	372.42'
C4	44°00'01"	428.34'	328.94'
C5	8°50'27"	1432.39'	221.02'
C6	15°39'53"	686.17'	187.60'



SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THIS MAP IS AN ACCURATE REPRESENTATION MADE BY ME OR UNDER MY DIRECTION.

01/29/2020
DATE

JEREMY F. CHAPMAN
PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO. 45779

JEREMY F. CHAPMAN 45779 REGISTERED PROFESSIONAL LAND SURVEYOR STATE OF WASHINGTON 1/29/2020

612 Woodland Square Loop SE,
Suite 100
Lacey, WA 98503
360.292.7230
www.kpff.com

TOPOGRAPHIC SURVEY

OF A PORTION OF
SEC. 28, 29, 32, & 33
TWP 20 N, R 2 E, W.M.,
AT THE REQUEST OF
WESTERN STATE HOSPITAL

SCALE: 1" = 100'
JOB: 81900132
DATE: 01/29/2020
SHEET 4 OF 5
81900132.DWG

TOPOGRAPHIC SURVEY
IN
SECTION 28, 29, 32, & 33, TOWNSHIP 20N, RANGE 2 EAST, W.M.

0 100 200 300

SCALE 1" = 100'

NOTES

SEE SHEET 1 OF 5 SHEETS FOR THE EASEMENT NOTES AND LEGEND

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 86°54'10" E	51.10'
L2	S 27°59'38" E	7.24'
L3	S 01°23'40" W	11.00'
L4	S 01°03'39" W	19.08'

CURVE TABLE

CURVE	DELTA ANGLE	RADIUS	ARC LENGTH
C1	50°00'00"	222.30'	193.99'
C2	65°00'00"	120.00'	136.14'
C3	52°08'00"	409.30'	372.42'
C4	44°00'01"	428.34'	328.94'
C5	8°50'27"	1432.39'	221.02'
C6	15°39'53"	686.17'	187.60'

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THIS MAP IS AN ACCURATE REPRESENTATION MADE BY ME OR UNDER MY DIRECTION.

01/29/2020
DATE

JEREMIE F. CHAPMAN
PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO. 45779

JEREMIE F. CHAPMAN 45779 REGISTERED PROFESSIONAL LAND SURVEYOR STATE OF WASHINGTON 1/29/2020

kpff
612 Woodland Square Loop SE,
Suite 100
Lacey, WA 98503
360.292.7230
www.kpff.com

TOPOGRAPHIC SURVEY

OF A PORTION OF
SEC. 28, 29, 32, & 33
TWP 20 N, R 2 E, W.M.,
AT THE REQUEST OF
WESTERN STATE HOSPITAL

SCALE: 1" = 100'
JOB: 81900132
DATE: 01/29/2020
SHEET 5 OF 5
81900132.DWG

Appendix 5: Natural Resources Reconnaissance

February 7, 2020

Craig Tompkins, AIA
SRG PARTNERSHIP, INC
621 SW Columbia Street
Portland, Oregon 97201

Via email: ctompkins@srgpartnership.com

Regarding: Natural Resource Evaluation
Western State Hospital Master Plan Update
Lakewood, Washington
PBS Project 41189.001, Phase 0001

Mr. Tompkins,

PBS has been retained to conduct initial site investigation to support City of Lakewood SEPA permitting for master planned improvements on the Western State Hospital Campus. The site investigation consists of an evaluation of the natural resource elements typically regulated under SEPA in the soils, water, plants, and animals' sections of SEPA. The following specific resources in these categories will be addressed:

- Soils. General characteristics of the soils present at the site
- Waters. A summary of mapped floodplains, wetlands, streams and other waters on the Campus or in the vicinity
- Plants. A summary of the plants present on the Campus, with particular emphasis on wetland plants; plants that are listed under the US Endangered Species Act as Endangered, Threatened, or Candidate; have been identified as rare or sensitive; have populations of high conservation value; or are considered noxious weeds.
- Animals that are listed under the US Endangered Species Act as Endangered, Threatened, or candidate; are otherwise federally regulated; are considered priority habitats or species by Washington State Department of Fish and Wildlife; or are defined by the City of Lakewood as Critical Fish or Wildlife species.

The following memorandum introduces the site and the master plan process and describes the methods and results of the initial environmental site investigation.

1 SITE LOCATION AND DESCRIPTION

Western State Hospital (WSH) is located in the City of Lakewood, Washington (Figure 1). The City of Lakewood (City) is located in western Pierce County approximately seven miles south of the City of Tacoma, and 22 miles to the northeast of the state capital in Olympia.

The Western State Hospital Campus is located on the north side of Steilacoom Boulevard SW, extending from 87th Avenue SW on the east to Sentinel Drive on the west. The Campus extends northward from Steilacoom Boulevard SW to Golf course Road SW on the east side to approximately 79th Street SW on the west. The campus totals approximately 288 acres, and is composed of four separate tax parcels, described below.

The largest parcel (0220321022) is 215.71 acres is size, and includes the frontage of Steilacoom Boulevard SW from 87th Avenue SW westward to Sentinel Drive. This parcel contains most of the developed portions of the campus, as well as Garrison Springs and the associated forested valley slopes.

The second parcel (0220321007) is 36.73 acres in size, and extends northward from Garrison Springs. This parcel includes the majority of the Fort Steilacoom Golf Course.

The third parcel (0220283027) is 29.75 acres in size, and is located to the north of Parcel 0220321007. This parcel includes the northern ¼ of the Fort Steilacoom Golf Course, the forested valley slope to the north, and the forested disc golf course area to the east.

The last parcel (0220283026) is located at the northeastern-most corner of the site and is 6.15 acres in size. The parcel is currently part of the disc golf course.

2 MASTER PLANNING

WSH was established on the site of historic Fort Steilacoom in 1871, and is one of only two state-owned psychiatric hospital for adults in Washington. WSH provides inpatient mental health services to adults from 20 western Washington counties. The hospital provides evaluation and inpatient treatment for individuals with serious or long-term mental illness, including patients referred through their Behavioral Health Organization, the civil court system (when individuals meet the criteria for involuntary treatment under RCW 71.05), or through the criminal justice system (RCW 10.77). WSH provides more than 800 beds for these patients, and employs approximately 2,200 staff members, making it the fourth largest employer in the City of Lakewood.

DSHS is engaged in an ongoing master planning effort for the WSH campus to: incorporate changing facility needs; address the growth management issues of stakeholders (including Pierce County and the City of Lakewood); and streamline the permitting process for future projects. The initial master plan for the campus was approved by the City in 1998 and is based on a 10-year planning period. An update to the Master Plan was prepared in 2008, and the latest planning efforts were initiated in 2018. As part of the current master planning update, DSHS has evaluated several alternatives for layout of the campus, including rehabilitating existing buildings and constructing new facilities.

3 METHODS

The presence of elements of the natural environment were evaluated using a two-step process. The first step consisted of an in-office evaluation based of existing maps and documents for the vicinity. The second step consisted of a reconnaissance level field evaluation to ground-truth the in-office evaluation and identify any additional resource present. Additional details of the methods used for these two steps are described below.

In-Office Evaluation

The office evaluation consisted of a review of online sources and documents to identify the presence of or conditions that would support the presence of natural resource elements (soils, water, plants, and animals). The Study Area for the in-office evaluation included the WSH Campus and adjoining areas within 200 feet as required by Lakewood Municipal Code (LMC) 14.162.070. Specific documents reviewed included:

General site information:

- Current and recent historical aerial photographs (Google Earth, 2019)

- Climate and precipitation data (US Department of Agriculture National Resources Conservation Service [USDA NRCS] Field Office, 2019a)

Soils:
- Digital soil data for the Study Area (USDA NRCS, 2019b)

Water:
- FEMA floodplain maps (FEMA, 2019)
- Wetlands of High Conservation Value and USFWS National Wetland Inventory map (Washington Department of Natural Resources [WDNR], 2019b)
- Local critical area data from Pierce County PublicGIS (Pierce County, 2019)

Plants:
- Endangered species information (IPaC Information for Planning and Consultation; USFWS, 2019)
- Known rare plants and nonvascular species of high conservation value (WDNR, 2019b)
- County list of rare plants (WDNR, 2018)
- State noxious weed list (Washington State Noxious Weed Control Board, 2019)
- County noxious weed list (Pierce County Noxious Weed Control Board, 2019)

Animals:
- Fish Passage online mapping application (WDFW, 2019a)
- Forest Practices Application Review System mapper (WDNR, 2019a)
- Priority Habitats and Species online mapping (WDFW, 2019c)
- Salmonscape (WDFW, 2019d)
- Salmon and Steelhead Stock Inventory Assessment Program Statewide Fish Distribution (SWIFD) Map (The Northwest Indian Fisheries Commission, 2019)
- Streamnet (Pacific States Marine Fisheries Commission, 2019)

Other documents:
- Lakewood Municipal Code
- Lakewood Shoreline Management Program

Field Evaluation

Following the in-office evaluation, a reconnaissance level field evaluation was conducted. The purpose of the field evaluation was to verify date from the in-office evaluation and identify any additional resources present on the Western State Hospital Campus or in the vicinity.

The field evaluation included resources in the water, plant and animal elements of the natural environment, including wetlands, streams, and wildlife. The field evaluation was restricted to the parcels within the Western State Hospital Campus, with supplemental information collected from publicly accessible rights-of-way.

Plants

Plant communities were visually evaluated, and species were identified using botanical reference books (Cooke, 1997; Hitchcock and Cronquist, 1973; Pojar and MacKinnon, 2004; and Taylor, 1990) and web sites (Giblin et al., 2003; Pierce County Noxious Weed Control Board, 2019,WDNR, 2018 and 2019; and Washington Noxious Weed

Control Board, 2019). Plant nomenclature and wetland indicator status are consistent with the *2016 National Wetland Plant List* (Lichvar et al., 2016).

Wetlands

The wetland component of the field evaluation was conducted in accordance with the definition from the LMC 14.162.020, using the methods outlined in the US Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (Environmental Laboratory, 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Supplement (Version 2.0)* (WMVC Regional Supplement) (USACE, 2010), and the *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997).

Wetlands on the WSH Campus were classified according to the habitat guidelines in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), and preliminary ratings were determined using the criteria the *Washington State Wetland Rating System for Western Washington* Revised (Hruby, 2014).

Streams

The presence of stream bed and bank features were identified based on the presence of an ordinary highwater mark (OHWM) consistent with the criteria listed in LMC 14.164.010. The presence of an OHWM was determined using the indicators described in *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et. Al., 2016). Stream in on the WSH Campus were preliminarily rated using the criteria identified in the City of Lakewood's Shoreline Master Program (SMP) Chapter 4 Section C.

Animals (Fish and Wildlife)

The presence of fish and wildlife were identified consistent with the requirements outlined for Fish and Wildlife Habitat Conservation Areas in Pierce County Code (PCC) 18E.040.030.B and City of Lakewood Municipal Code requirements for Critical Fish and Wildlife Habitat Conservation Areas (LMC 14.154.020).

The field evaluation of the presence of terrestrial wildlife and habitats was based on the presence of visual indicators such as nests, scat, trails, and audible such as calls and vocalizations. Stream habitats were identified consistent with the criteria in *The California Department of Fish and Game Salmonid Habitat Restoration Manual* (CDFG 1998) and *Stream habitat classification and inventory procedures for northern California* (McCain et al., 1990).

4 RESULTS

The results of the office review and the field investigation are provided below. Sections for both evaluations are divided by environmental element.

Office Evaluation

The following sections document the results of the in-office evaluation.

Topography and Soils

The Campus is primarily upland terraces with slopes less than 15 percent; with the overall topography sloping gently from the southeast corner to the northwest corner. Steeper slopes (up to 70 percent in some areas) are present on the forested valley slopes to the north and south of the golf course.

Three soil mapping units were identified in the study area: Spanaway gravelly sandy loam; Everett very gravelly sandy loam; and Xerochrepts (Web Soils Survey, NRCS, 2019b). The boundaries between these soil map units are shown in Figure 2, and a summary of the characteristics is provided below in Table 1.

Table 1 Soils present in the Study Area[1]

Symbol	Map Unit Name	Slope	Landform	Parent Material	Drainage Class	Soils hydric? Hydric inclusions?
41A	Spanaway gravelly sandy loam	0 to 15%	Terraces and plains	Glacial outwash	Somewhat excessively drained	No (15% Spana, Yes)
13D	Everett very gravelly sandy loam	15 to 30%	Outwash terraces and escarpments, kames, moraines, eskers	Glacial outwash	Somewhat excessively drained	No (10% Alderwood, No but may support wetlands in some situations) (10% Indianola, No)
47F	Xerochrepts	45 to 70%	Valley sides	Sandy and gravelly outwash and/or glacial till	Well drained	No

[1] NRCS, 2019b.

Spanaway soils occur at elevations from 200 to 590 feet and are typically used for woodland, pasture, cropland, homesites, and wildlife habitat (NRCS, 2019b). Spanaway gravelly sandy loam is not considered a hydric (wetland) soil by the National Technical Committee for Hydric Soils (NTCHS).

Everett soils occur at elevations from 30 to 900 feet and are typically used for livestock grazing, timber production, and urban development (NRCS, 2019b). Everett very gravelly sandy loam is not considered a hydric soil by the NTCHS, however this soil unit does include slopes of 15 to 30 percent.

Xerochrept soils occur at elevations from 0 to 980 feet on steep valley sides; these soils are not considered hydric soils by NTCHS, however this soil unit does include slopes of 45 to 70 percent.

Wetlands

The Washington Natural Resources Heritage Program (Figure 3), using the U.S. Fish and Wildlife Service National Wetland Inventory (NWI) data, identifies two riverine wetland systems (R4SBC; riverine intermittent streambed seasonally flooded) within the study area and one palustrine wetland (PUBKx; palustrine unconsolidated bottom artificially flooded excavated) to the west of the property (WDNR, 2019b). Pierce County PublicGIS does not identify wetlands on or within the vicinity of the Site (Figure 4) (Pierce County, 2019).

Streams and other Waters

Two streams were identified within the Study Area: Garrison Springs and an Unnamed Tributary to Chambers Creek. The stream locations shown on maps from WDFW, WDNR, and Pierce County and fisheries resources are consistent with the riverine wetland systems identified in the National Wetland Inventory mapping (Figure 3).

Plants

The following sections detail the results for evaluation of plant species listed under the federal Endangered Species Act, plant species or habitats identified as rare or sensitive by the WDNR Natural Resources Heritage Program, priority habitats and species identified by WDFW; and noxious weeds identified by the Washington State and Pierce County Noxious Weed Control Boards.

Federally Listed Plants

A review of information from the USFWS IPaC database (Appendix A) identified three federally threatened or endangered plant species as potentially present in the vicinity of the project. These species are listed in Table 2 and described below.

Table 2. Federally Listed Plant Species

Common Name	Scientific Name	Federal ESA Listing Status	Critical Habitat Designated?
Golden Paintbrush	*Castilleja levisecta*	Threatened	No
Marsh Sandwort	*Arenaria paludicola*	Endangered	No
Water Howellia	*Howellia aquatilis*	Threatened	No

Golden paintbrush is listed as Threatened under the ESA and is found in native northwest grasslands. There are no current or historic populations in Pierce County (USFWS, 2000). Marsh sandwort is listed as Endangered under the ESA. This species is found in swamps, wetlands, and freshwater marshes along the coast (WDNR, 2019c). In western Washington, water howellia occurs in low-elevation wetlands and small vernal pools (WDNR, 2019c).

Rare and Sensitive Plant Species

The WDNR Natural Resources Heritage Program website identifies three rare or sensitive species as potentially present on or near the WSH Campus. Characteristics of these species are listed in Table 3 and described below.

Table 3. Rare and Sensitive Plant Species

Common Name	Scientific Name	Historic or Current presence?	Washington State Status	Potential habitat present?
White-top aster	*Seriocarpus rigidus*	Current	Sensitive	Yes
Common bluecup	*Githopsis specularioides*	Historic	Sensitive	Possible
Giant chain fern	*Woodwardia fimbriata*	Historic	Sensitive	Yes

White-top aster is found in relatively flat, open grasslands of lowlands in gravelly, glacial outwash soils (WDNR, 2019c). White-top aster is mapped as occurring in the northeast corner of the WSH Campus (Figure 3) and has been identified by WDNR as present as recently as August 13, 2010 (WDNR 2019b).

Common bluecup is historically found in the vicinity of the WSH Campus. This species is found in dry, open places in lowlands, such as grassy balds, talus slopes, and gravelly prairies. There are no recent observations of common bluecup in Pierce County, and none of the habitats that support this species are present within the Study Area.

Giant chain fern is historically found in the vicinity of the WSH Campus. This species is found in stream banks, shaded wet road banks, the edges of bogs, and wet bluffs amongst coniferous trees and adjacent to saltwater. Similar habitats are present on the Western State Hospital Campus and nearby.

Native Plants

Mapping from the WDNR Natural Resources Heritage Program identifies a single native plant community as present on or near the WSH Campus. This plant community is Oregon white oak (*Quercus garryana*) dominated or co-dominated canopies. This community occurs in four locations on the Western State Hospital Campus: two on the eastern end of the Fort Steilacoom Golf Course near Garrison Springs, and two to the east one either side of Kids First Lane. Location of these habitat area are shown on Figure 5.

Noxious, Invasive, and Non-Native Plants

No noxious weeds are mapped on the Western State Hospital Campus. Table 4 presents a list of noxious weeds and non-native plants identified in the Study Area or mapped within the vicinity.

Table 4. List of Noxious, Invasive, and Non-Native Plants

State Classification	Common Name (*Scientific Name*)
Class A Noxious Weed	Spotted knapweed (*Centaurea biebersteinii,* or *C. maculosa*) Tansy ragwort (*Senecio jacobaea*)

[1] Non-regulated noxious weed per Pierce County Noxious Weed Control Board

Future projects will meet Pierce County and City of Lakewood regulations with regard to the control of noxious and invasive weeds.

Animals

Federal and State-Listed Habitats and Species

The USFWS IPaC website (Appendix A), NOAA Fisheries ESA listings, and WDFW PHS data (Figure 6) identify several federally and state threatened or endangered species, as well as priority habitats and species in the vicinity of the project. The results are presented in Table 5.

Table 5. Listed Habitats and Species

Common Name	Scientific Name	Status	Critical Habitat Designated?
Puget Sound Chinook Salmon	*Oncorhynchus tshawytscha*	Federally Threatened	Yes
Puget Sound Steelhead	*O. mykiss*	Federally Threatened	Yes
Puget Sound-Coastal Bull Trout	*Salvelinus confluentus*	Federally Threatened	Yes
Gray wolf	*Canus lupus*	Federally Endangered (Proposed for delisting)	No
North American Wolverine	*Gulo gulo luscus*	Federally Threatened (Proposed)	No
Marbled murrelet	*Brachyramphus marmoratus*	Federally Threatened	Yes
Streaked horned lark	*Eremophila alpestris strigata*	Federally Threatened	Yes
Yellow-billed cuckoo	*Coccyzus americanus*	Federally Threatened	Proposed

Common Name	Scientific Name	Status	Critical Habitat Designated?
Oregon spotted frog	*Rana pretiosa*	Federally Threatened	Yes
Biodiversity area	N/A	State Priority Habitat	N/A
Little brown bat	*Myotis lucifugus*	State Priority Species	N/A
Slender-billed white-breasted nuthatch	*Sitta carolinensis aculeata*	State Candidate Species	N/A
Western Pond Turtle	*Actinemys marmorata*	State Endangered	N/A

Salmonscape (Figure 7) and StreamNet (Figure 8) were also reviewed for presence of anadromous fish, but no habitat was identified in either database. No invasive animals are known to be present in the Study Area.

Migratory Bird Act and the Bald and Golden Eagle Protection Act

The USFWS IPaC website (Appendix A) provided several species which are protected under the Migratory Bird Act that may be present in the Study Area. These species. The results are presented in Table 6.

Table 6. Listed Migratory Birds

Common Name	Scientific Name	Breeding Season[1]
Bald Eagle	*Haliaeetus leucocephalus*	January 1 – September 30
Black Turnstone	*Arenaria melanocephala*	Breeds elsewhere[2]
Great Blue Heron	*Ardea herodias fannini*	March – August 15
Lesser Yellowlegs	*Tringa flavipes*	Breeds elsewhere[2]
Marbled Godwit	*Limosa fedoa*	Breeds elsewhere[2]
Olive-sided Flycatcher	*Contopus cooperi*	May 20 – August 31
Red-throated Loon	*Gavia stellate*	Breeds elsewhere[2]
Rufous Hummingbird	*Selasphorous rufus*	April 15 – July 15
Western Screech-owl	*Megascops kennicottii kennicottii*	March 1 – June 30

[1] Noted by USFWS to be a liberal estimate of breeding season

[2] Indicates the species does not likely breed within project area

Critical Fish and Wildlife Species and Habitats

LMC 14.154.020 identifies a list of 11 critical fish and wildlife species and habitats, five of which are likely to occur on-site. Table 7 provides details on these critical fish and wildlife species and habitats.

Table 7. Critical Fish and Wildlife Species and Habitats

Habitats and Species of Local Importance	Description
Priority Oregon white oak woodlands	WDNR identifies four patches of either oak-dominant forest or woodland canopy, or urban oak canopy (Figure 5). The four patches are located in the northern half of the property, and total 32.61 acres.
Snag-rich areas	Snag-rich areas are likely to occur adjacent to the two streams within the Study Area.
Rivers and streams with critical fisheries	Rivers and streams with critical fisheries are known to occur in the Study Area and are discussed above.
Waters of the state, including all water bodies classified by the Washington Department of Natural Resources (DNR) water typing classification system as detailed in WAC 222-16-030, together with associated riparian areas	WDNR Forest Practices Application Mapping Tool identifies Garrison Springs and the unnamed tributary to Chambers Creek within the Study Area (Figure 9).
Lakes, ponds, streams, and rivers planted with game fish by a governmental entity or tribal entity.	Garrison Springs Hatchery may meet the requirements of this habitat of local importance, the hatchery is run by WDFW (WDFW, 2019b).

Field Evaluation

Patrick Togher (Professional Wetland Scientist) conducted the field evaluation of the project Study Area on June 27, 2019. The field evaluation was conducted from within the Western State Hospital Campus, with supplemental data collected from publicly accessible rights-of-way.

The level of effort for this field evaluation is consistent with a reconnaissance level analysis. As a result, formal delineations of wetlands and streams were not conducted, and formal presence studies were not complete for the presence of ESA species or rare plants.

Soils

No field evaluation was conducted for soils. Individual projects within the Master Plan will require preparation of a Geotechnical Memorandum or Geotechnical Report to assess soil and slope characteristics for compliance with SEPA and City of Lakewood permit requirements.

Wetlands

An evaluation of the presence of wetlands requires that the reviewer determine whether the recent rainfall reflects the normal precipitation for the area. For this evaluation, precipitation data was gathered from the Tacoma weather station #1, which is north nearest site with comprehensive precipitation records. Precipitation

measurements for the three months preceding the field visit were reviewed and area summarized in Table 8. Rainfall data for June 1 – 26 of 2019 is included in the table, but was not used in the calculation of normal rainfall.

Table 8. Monthly Precipitation in Inches and "normal" ranges and means for the Tacoma #1 Station, Tacoma, Washington[1]

Month	Mean[1]	30% chance less than[1]	30% chance more than[1]	Measured Rainfall	Condition	Value	Weight	Result[2]
March	4.5	3.32	5.28	1.9	Below	1	1	1
April	3.19	2.13	3.82	2.65	Normal	2	2	4
May	2.07	1.11	2.53	0.4	Below	1	3	3
June 1-26[3]	1.52	0.95	1.84	0.14	Below			
Overall								**8**

[1] Agricultural Applied Climate System WETS Station in Tacoma#1 Weather Station, Tacoma, WA. Data for the normal range represents the period from 1983 to 2018 (USDA NRCS, 2019a).
[2] Results of 6-9 are below normal, results of 10-14 are normal, results of 15-16 are above normal.
[3] Precipitation for the portion of June prior to the field visit.

Precipitation for the three months before the field evaluation was below normal, and the rainfall for the 26 days immediately preceding the field visit were also below normal for this period. However, seeps on the site were flowing freely and streams in the vicinity were near their normal water levels. As a result, we believe that sufficient primary and secondary indicators of wetland hydrology were present to assess the presence of wetlands on the Campus.

Two wetlands (GS South and GS North) were identified within or in the immediate vicinity of the project area (Figure 9). A description of the wetlands is provided in Table 9. The table summarizes the Cowardin classification, hydrogeomorphic class, and preliminary rating and buffer width per LMC 14.162.080.

Table 9. Potential Wetlands Present at the Site with Preliminary Ratings and Buffers

Wetland	Wetland HGM Class[1]	Cowardin Classification[2]	Dominant Species Observed	Wetland Hydrology Indicators Observed	Preliminary Wetland Rating[3,4]	Preliminary Buffer Width4[3]
GS South	Slope	Palustrine Forested (PFO)	Red alder, salmonberry, Himalayan blackberry, lady fern, giant horsetail, and English ivy	Saturation at the surface, shallow inundation/surface flows	II/III	60-225

GS North	Slope	Palustrine Forested (PFO)	Red alder, salmonberry, Himalayan blackberry, lady fern, giant horsetail, small-fruited bulrush, and English ivy	Saturation at the surface, shallow inundation/surface flows	II/III	60-225

[1] Hydrogeomorphic classification after Hruby (2014).
[2] Cowardian classification after Cowardin et al. (1979).
[3] Preliminary rating based on Washington State Wetland Rating System for Western Washington (Hruby, 2014).
[4] Local wetland ratings and buffer widths are based on City of Lakewood Municipal Code (LMC) Title 14 – Environmental Protection (LMC 14.162).

Wetlands GS North and GS South are slope wetlands associated with the Garrison Springs riparian corridor. Numerous areas of seepage were observed on the valley walls upslope of the stream during the site visit, and these areas were dominated by wetland plant species. Preliminary wetland ratings were completed with the 2014 Washington State Wetland Rating System for Western Washington, consistent with LMC 14.162.030. Both wetlands fall on the margin of the Category II/III. Buffers for wetland with these ratings range from 60-225 feet, depending on the habitat score.

Streams

The presence of the two streams identified during the in-office evaluation were confirmed during the field evaluation. These streams, Garrison Springs and an Unnamed Tributary to Chambers Creek, are shown on Figures 3, 7 and 8. A summary of the characteristics of these streams and preliminary stream rating and buffer widths are provided in Table 10.

Table 10. Potential Streams present at the Site and preliminary rating

Stream	Flows to	Preliminary Stream Rating[1,2]	Preliminary Buffer Width[2]
Garrison Springs	Chambers Creek	Perennial, Fish-bearing (Type F)	65-150
Unnamed Tributary to Chambers Creek	Chambers Creek	Perennial, Fish-bearing (Type F)	65-150

[1] Water typing based on definition per 14.165.010
[2] Local stream ratings and buffer widths are based on Lakewood's Shoreline Master Program (SMP) Chapter 4 Section C.

Garrison Springs/Garrison Creek is located in the central west portion of the Western State Hospital Campus. Garrison Springs, is a perennial stream, originating from seeps on the steep slopes on the western portion of the Campus and flowing northwest to the Garrison Springs Hatchery and the Chambers Creek Estuary on Puget Sound. Garrison Springs is approximately 5-15 feet wide at the ordinary high water mark and appeared to be channelized adjacent to the access road which leads to the hatchery. Current habitat in the stream is predominantly riffle and run type. Pools are largely limited to the areas above man-made structures on the stream. The stream substrate is primarily gravels with some fines, and the banks are somewhat incised. Mixed forest canopy and forested slope wetlands provided 100 percent canopy coverage, except where interrupted by

the hatchery access road. The stream flows beneath Chambers Creek Road, entering Chambers Creek through a concrete box outfall with a steel rack that limits access.

The unnamed stream is a tributary to Chambers Creek and is located beyond the Campus northern property line. As a result, most of the stream could not be evaluated during the site assessment. However, water could be heard flowing the deep, steep sided valley located to the north of the Fort Steilacoom Golf Course. The lower reach of this stream appears to be piped beneath the abandoned industrial facility at Chambers Creek Road. Several seeps areas were also identified in this area, and a concrete pipe outfall was located on the estuary of Chambers Creek, which likely represents the terminus of this stream. Flows were present at the outfall in July 2019, indicating that flows in this stream area likely perennial. Aerial imagery shows a densely vegetated, mixed forest riparian canopy in the riparian area, extending from the disc golf area northwest to Chambers Creek Road.

Future Master Plan projects at the Campus that require State or federal funding or permits will be required to assess the presence of wetlands and streams prior to funding or permit approval. More detailed field studies would be conducted at this time.

Plants

The majority of the Campus is developed, and vegetation in these areas consists of maintained lawn area with landscape trees. Species present in this area include common domestic grasses (bent grasses [*Agrostis* sp.], bluegrasses [*Poa* sp.], fescues [*Festuca* sp.], and rye grasses [*Lolium* sp.]) and disturbance tolerant forbs (e.g. common dandelion [*Taraxicum officinale*], hairy cat's ear [*Hypocharis radicata*], sheep sorrel [*Rumex acetosella*], etc.), and landscape trees (domestic cherry and flowering plums [*Prunus* sp.], European horse-chestnut [*Aesculus hippocastanum*], Norway maple [*Acer platanoides*], and Tree-of-Heaven [*Alianthus altissima*]), with scattered native trees (Douglas fir [*Pseudotsuga menziesii*], Sitka spruce [*Picea sitchensis*], and copses of Oregon white oak.

The Fort Steilacoom Golf Course is located the northwest corner of the property, and is also maintained as grass, with scattered native coniferous trees and Oregon White Oak. The disc golf area has a similar canopy to the golf course. In the open areas, the shrub community is dominated by Scot's brook (*Cytissus scoparius*). In areas where the canopy is denser, the dominant shrub species include California dewberry (*Rubus ursinus*), dull Oregon grape (*Berberis nervosa*), evergreen blackberry (*Rubus laciniatus*), Himalayan blackberry (*Rubus armeniacus*), and snowberry (*Symphicarpos albus*).

In the two ravine areas, the vegetation consists of a mixture of native and non-native species. The dominant species present include red alder (*Alnus rubra*) and bigleaf maple (*Acer macrophyllum*) in the canopy, and California dewberry (*Rubus ursinus*), dull Oregon grape, evergreen blackberry, Himalayan blackberry, oceanspray (*Holodiscus discolor*), salmonberry (*Rubus spectabilis*), snowberry, and vine maple (*Acer circinatum*). Dominant herbaceous species present include giant horsetail (*Equisetum telmateia*), orchard grass (*Dactylis glomerata*), reed cararygrass (*Phalaris arundinacea*), Pineland sword fern (*Polystichum munitum*), and western lady fern (*Athyrium cyclosorum*).

Federally Listed Plants

The field reconnaissance did not identify any individuals of golden paintbrush, marsh sandwort or water howellia on the WSH campus. However, the protocols for identification of ESA plants require multiple field visits conducted over several years, and timed to match the emergence/flowering of the target species. Future projects in the Master Plan will need to conduct more comprehensive field studies to fully determine the presence of ESA listed plants.

Rare and Sensitive Plant Species

The field reconnaissance did not identify any individuals of white-top aster, common bluecup, or giant chain fern. However, the protocols for identification of rare and sensitive species may require multiple field visits timed to match the emergence/flowering of the target species. Considering the relatively recent identification of white-top aster (August 2010). This species should be presumed to be present, and future projects in the Master Plan will need to conduct more comprehensive field studies for the presence of rare and sensitive plant species.

Native Plants

Table 11 presents a list of the native trees, shrubs, and herbaceous species identified on the WSH Campus during the field evaluation.

Table 11. List of Native Plants on WSH Campus

Stratum	Common Name (*Scientific Name*)
Tree	Bigleaf maple (*Acer macrophyllum*) Oregon white oak (*Quercus garryana*) Red alder (*Alnus rubra*)
Shrub	California dewberry (Rubus ursinus) Dull Oregon grape (*Berberis nervosa*) Oceanspray (*Holodiscus discolor*) Salmonberry (*Rubus spectabilis*) Snowberry (*Symphicarpos albus*) Vine maple (*Acer circinatum*)
Herbaceous	Giant horsetail (*Equisetum telmateia*) Orchard grass (Dactylis glomerata) Sword fern, or Pineland sword fern (*Polystichum munitum*) Western lady fern (*Athyrium cyclosorum*)

Noxious, Invasive, and Non-Native Plants

No Class A noxious weeds were identified on the WSH Campus during the field investigation. Scattered knapweed specimens were present on the site, but were not positively identified as *C. biebersteinii*. A number of Class B and C noxious weeds were identified on the Campus. These species are listed below in Table 12.

Table 12. List of Noxious, Invasive, and Non-Native Plants

State Classification	Common Name (*Scientific Name*)
Class A Noxious Weed	Scattered knapweed specimens were present on the site, but were not positively identified as *C. biebersteinii.*
Class B Noxious Weed	Scot's broom (*Cytissus scoparius*) [1]
Class C Noxious Weed	English ivy (*Hedera helix*) Evergreen blackberry (*Rubus laciniatus*)[1] Hairy cat's ear (*Hypochaeris radicata*) Himalayan blackberry (*Rubus armeniacus*) [1] Reed canarygrass (*Phalaris arundinacea*) [1] Tree of Heaven (*Alianthus altissima*)

State Classification	Common Name (*Scientific Name*)
Non-regulated, non-native species	Bentgrasses (*Agrostis* sp.) Bluegrass (*Poa* sp.) Cherry (likely cultivar varieties of the genus *Prunus*) Common sheep sorrel (*Rumex acetosella*) Eastern redcedar (*Juniperus virginiana*) European horse-chestnut (*Aesculus hippocastanum*) Fescue grasses (*Festuca* sp.) Flowering plum (varieties of the genus *Prunus)* Lanceleaf plantain (*Plantago lanceolata*) Norway Maple (*Acer platanoides*)

[1] Non-regulated noxious weed per Pierce County Noxious Weed Control Board.

Future Master Plan projects at the Campus will need to meet Pierce County and City of Lakewood regulations with regard to the control of noxious and invasive weeds.

Animals

The only positive wildlife identifications during the field evaluation were woodpeckers (identified by their sound), squirrels (likely eastern gray squirrel [*Sciurus carolinensis*] or eastern fox squirrel [*Sciurus niger*]), and American crow (*Corvus brachyrhynchos*). However, considering the large size of the site and the presence of relatively undisturbed riparian areas in close proximity to Puget Sound, we would anticipate a variety of wildlife species that are adapted to proximity with suburban human populations, such as rats, mice, voles and similar rodents; North American raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), and passerine bird species. Deer (*Odocoileus* sp.) and coyote (*Canis latrans*) and were not observed on the Campus, but are likely present due the proximity of the riparian habitats on and near the Campus to Chambers Creek Estuary, which supports a variety of fish and wildlife species. A brief reconnaissance of the estuary area positively identified deer, great blue heron (*Ardea herodias*), and bald eagle (*Haliaeetus leucocephalus*).

Federal and State-Listed Habitats and Species

Suburban developed areas in the Puget Sound do not provide suitable, usable habitat for large terrestrial predators such as Gray wolf or North American Wolverine. Oregon spotted frog requires relatively large areas of emergent wetland that are not present on the Campus.

Exposed gravel areas to the site could provide potential habitat for streaked horned lark, but the frequency of disturbance on the Campus makes nesting by this species unlikely. Nearby marine areas could potentially provide foraging habitat for marbled murrelet. Habitat suitable for use by yellow-billed cuckoo includes large tracts of riparian habitat with small trees and shrubs suitable for nesting. Some areas of similar riparian habitat are present on the Campus and nearby. Future projects should assume that streaked horned lark, marbled murrelet, yellow-billed cuckoo or suitable habitats may be present and should conduct more detailed studies.

Streams on the Campus and nearby have long culverted sections or other man-made barriers that preclude use by listed anadromous ESA listed fish species (Chinook salmon, steelhead, and bull trout). However, these species are present in Puget Sound and likely use the nearby areas of Chambers Creek. As a result, future projects should assume the potential for impact to these species.

The riparian areas along Garrison Springs and the unnamed Tributary to Chambers Creek meet the definition of biodiversity areas and would be protected as critical areas. Similarly, habitats for little brown bat, slender-billed white-breasted nuthatch (mapped on the site) western pond turtle (mapped in the vicinity) would also need to be considered by future projects. Potential impacts to migratory birds during their breeding season would need to be considered by future projects.

Future Master Plan projects at the Campus should conduct detailed field studies to identify ESA listed, priority, and critical species and habitats in the immediate project vicinity.

5 CONCLUSIONS

We hope this memorandum has been responsive to your needs for a natural resource evaluation to support the preparation of a SEPA Checklist for the Western State Hospital Master Plan. Please feel free to contact me at 206.766.7618 or patrick.togher@pbsusa.com with any questions or comments.

Sincerely,

Digitally signed by Patrick J. Togher, PWS
Date: 2020.02.07 08:56:19 -08'00'

Patrick J Togher,
Senior Project Manager

PJT:GP:EJ

6 REFERENCES

Anderson, Paul S., Meyer, Susan, Olson, Patricia, and Stockdale, Erik. 2016. *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State*. October 2016 Final Review. Ecology Publication no. 16-06-029.

California Department of Fish and Game (CDFG). 1998. California Salmonid Stream Habitat Restoration Manual. Third Edition. Inland Fisheries Division. California Department of Fish and Game. Sacramento, CA.

City of Lakewood. 2019. City of Lakewood Municipal Code. Accessed online at: https://lakewood.municipal.codes/

City of Lakewood. 2014. *City of Lakewood Shoreline Master Program: Environment Designations, Policies, and Regulations*. Available online at: http://cityoflakewood.us/wp-content/uploads/2018/06/SMP_Final_Document_December_2014.pdf

Cooke, S. S. 1997. *A Field Guide to Common Wetland Plants of Western Washington and Northwestern Oregon*. Seattle, WA: Seattle Audubon Society.

Cowardin, L.M., Carter, V., Golet, F.C., and La Roe, E.T. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/OBS79/31. US Fish and Wildlife Service, Office of Biological Services, Washington, D.C.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. U.S. Department of the Army, Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Federal Emergency Management Agency (FEMA). 2019. FEMA's National Flood Hazard Layer (NFHL) Viewer. Accessed online at: https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd&extent=-122.68109821289039,47.103581842566264,-122.34876178710961,47.22029924549671

Giblin, D.E. & B.S. Legler (eds.). 2003+. WTU Image Collection Web Site: Vascular Plants, MacroFungi, & Lichenized Fungi of Washington State. University of Washington Herbarium. Accessed 17 Jul 2019. http://biology.burke.washington.edu/herbarium/imagecollection.php.

Google Earth. 2019. Online aerial photos.

Hitchcock, C. L., and A. Cronquist. 1973. *Flora of the Pacific Northwest: An Illustrated Manual*. Seattle, WA: University of Washington Press.

Hruby, T. 2014. *Washington State Wetland Rating System for Western Washington: 2014 Update*. (Publication #14-06-029). Olympia, WA: Washington Department of Ecology.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List: 2016 wetland ratings*. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

McCain, M., D.Fuller, L.Decker and K.Overton. 1990 . Stream habitat classification and inventory procedures for northern California. FHC Currents. No.1. U.S. Department of Agriculture. Forest Service, Pacific Southwest Region.

Pacific States Marine Fisheries Commission. 2019. Streamnet. A fisheries data project of the Pacific States Marine Fisheries Commission. Available online at: http://www.streamnet.org/data/interactive-maps-and-gis-data/

Pierce County. 2019. Pierce County PublicGIS. Accessed online at: https://matterhornwab.co.pierce.wa.us/publicgis/

Pierce County Noxious Weed Control Board. 2019. Pierce County Noxious Weed List. Accessed online at: http://www.piercecountyweedboard.org/index.php/noxious-weeds/noxious-weeds-2

Pojar J. and A. MacKinnon. 2004. *Plants of the Pacific Northwest Coast - Revised*. Lonepine Publishing.

Taylor, R. J. 1990. *Northwest Weeds: The Ugly and Beautiful Villains of Fields, Gardens, and Roadsides*. Missoula, MT: Mountain Press Publishing Company.

The Northwest Indian Fisheries Commission. 2019. The Salmon and Steelhead Habitat Inventory and Assessment Program (SSHIAP) Statewide Integrated Fish Distribution (SWIFD) Interactive Map Tool. Available online at: http://maps.nwifc.org/swifd/

U.S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0).* ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-3. Vicksburg, MS. U.S. Army Corps of Engineer Research and Development Center.

United States Department of Agriculture Natural Resources Conservation Service (NRCS). 2019a. Natural Resources Conservation Service, U.S. Department of Agriculture. Precipitation and WETS Data for Tacoma, Washington. Available online at: http://agacis.rcc-acis.org/?fips=53053. Accessed June 2019.

NRCS. 2019b. Web Soil Survey. Accessed on-line at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

U.S. Fish and Wildlife Service (USFWS). 2019. Endangered Species and Critical Habitat Listing, IPaC Information for Planning and Consultation Website. Accessed online at: https://ecos.fws.gov/ipac/

USFWS. 2000. *Recovery Plan for the Golden Paintbrush (Castilleja levisecta)*. USFWS, Portland, Oregon. 51 pp.

Washington Department of Fish and Wildlife (WDFW). 2019a. Fish Passage Web Application. Accessed online at: https://geodataservices.wdfw.wa.gov/hp/fishpassage/index.html

WDFW. 2019b. Hatchery Facilities. Available online at: https://wdfw.wa.gov/fishing/management/hatcheries/facilities?county=43

WDFW. 2019c. Priority Habitats and Species (PHS) on the Web. Accessed online at: http://apps.wdfw.wa.gov/phsontheweb/

WDFW. 2019d. SalmonScape. Accessed online at: http://apps.wdfw.wa.gov/salmonscape/

WDFW. 2019e. State Listed Species and State Candidate Species. Accessed online at: https://wdfw.wa.gov/sites/default/files/2019-06/threatened%20and%20endangered%20species%20list.pdf

Washington Department of Natural Resources (WDNR). 2019a. Forest Practices Application Mapping Tool. Accessed online at: https://fortress.wa.gov/dnr/protectiongis/fpamt/default.aspx

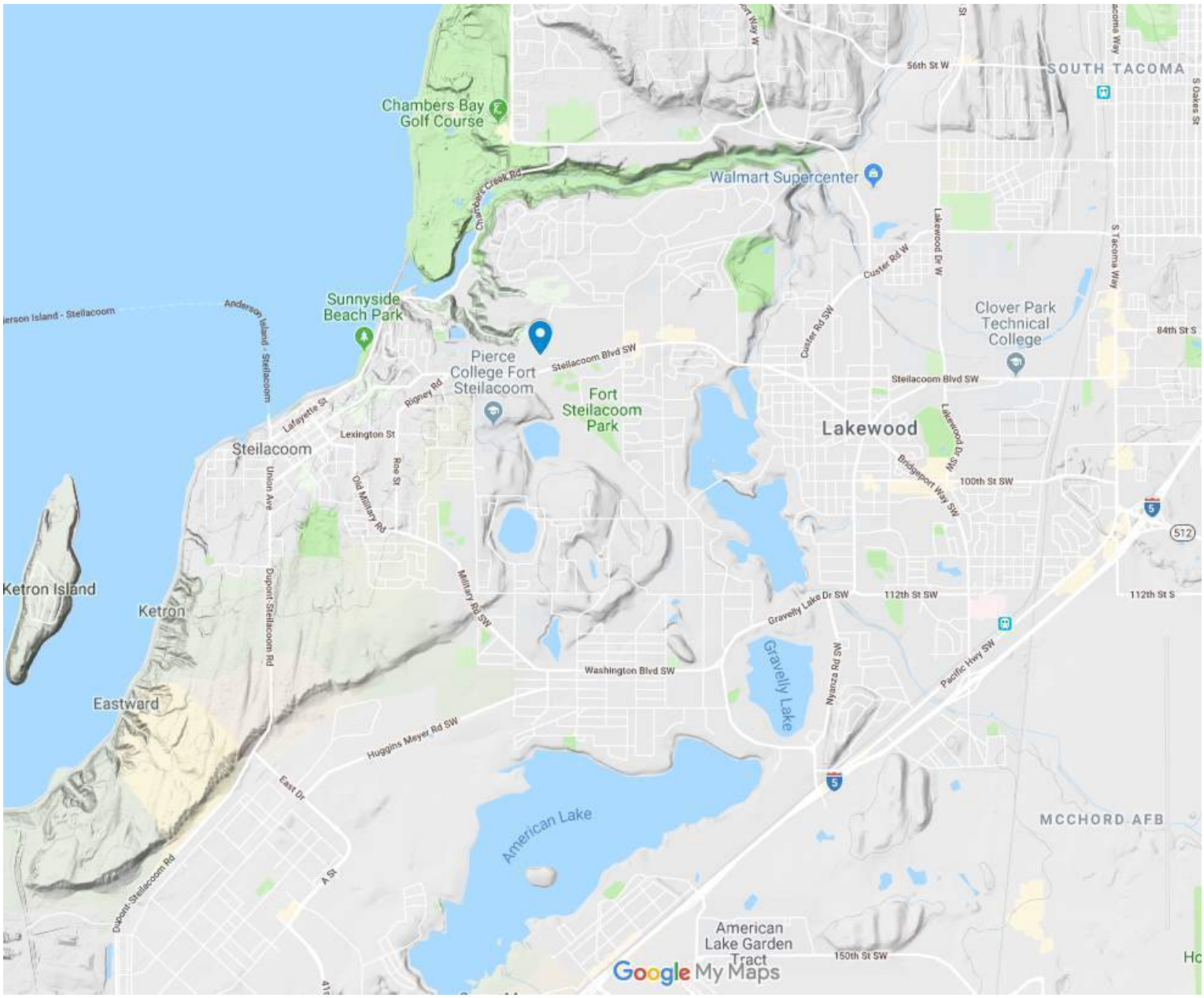
WDNR Washington Natural Heritage Program. 2019b. Washington Wetlands of High Conservation Value. Accessed online at: https://wadnr.maps.arcgis.com/apps/webappviewer/index.html?id=5cf9e5b22f584ad7a4e2aebc63c47bda

WDNR. 2018. Washington Natural Heritage Rare Plants and Nonvasculars. Accessed online at: https://www.dnr.wa.gov/NHPdata

WDNR. 2019c. Rare Plant Field Guide. Accessed online at: https://www.dnr.wa.gov/NHPfieldguide.

Washington Noxious Weed Control Board. 2019. Washington State Noxious Weed List. Accessed online at: https://www.nwcb.wa.gov/pdfs/2019-State-Weed-List_Scientific_Name-8.5x11_190102_151144.pdf

Figures



N

PBS		VICINITY MAP Western State Hospital Master Plan Update Natural Resource Reconnaissance Memorandum 9601 Steilacoom Blvd SW, Lakewood, WA 98498	FIGURE 1
PROJECT# 41189.001	DATE July 2019		

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13D	Everett very gravelly sandy loam, 15 to 30 percent slopes	3.6	0.6%
41A	Spanaway gravelly sandy loam	536.7	84.7%
47F	Xerochrepts, 45 to 70 percent slopes	76.3	12.0%
48A	Xerorthents, fill areas	11.7	1.9%
Totals for Area of Interest		**633.6**	**100.0%**

N

PBS

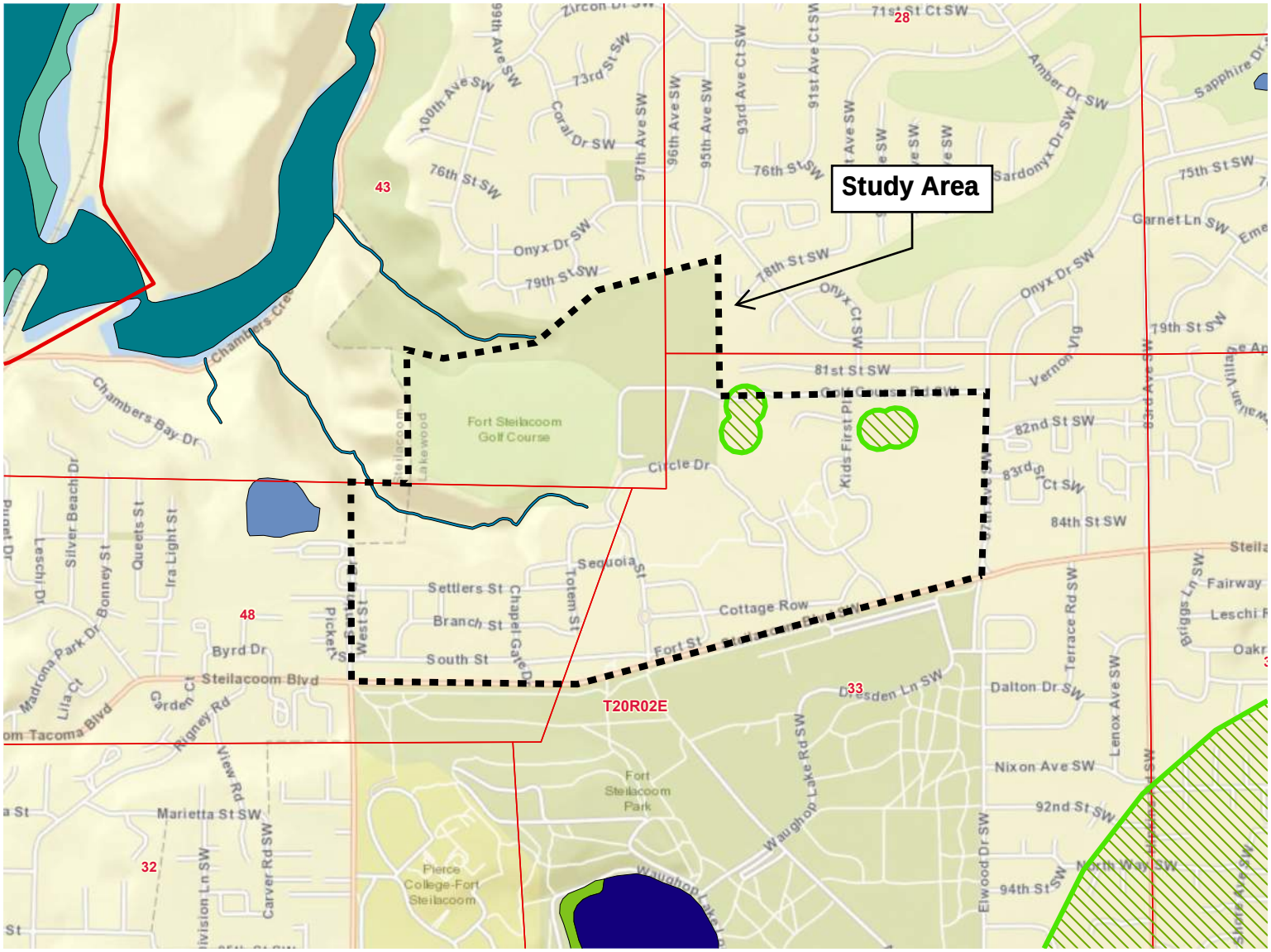
PROJECT# 41189.001

DATE July 2019

WEB SOIL SURVEY MAP
Western State Hospital Master Plan Update
Natural Resource Reconnaissance Memorandum
9601 Steilacoom Blvd SW, Lakewood, WA 98498

FIGURE

2



Known Rare Plants and Nonvascular Species of High Conservation Value

Counties

Townships

Sections

USFWS National Wetlands Inventory

Estuarine and Marine Deepwater

Estuarine and Marine Wetland

Freshwater Emergent Wetland

Freshwater Pond

Lake

Riverine

N

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

PBS

PROJECT# 41189.001

DATE July 2019

NATIONAL WETLAND INVENTORY & RARE PLANTS MAP

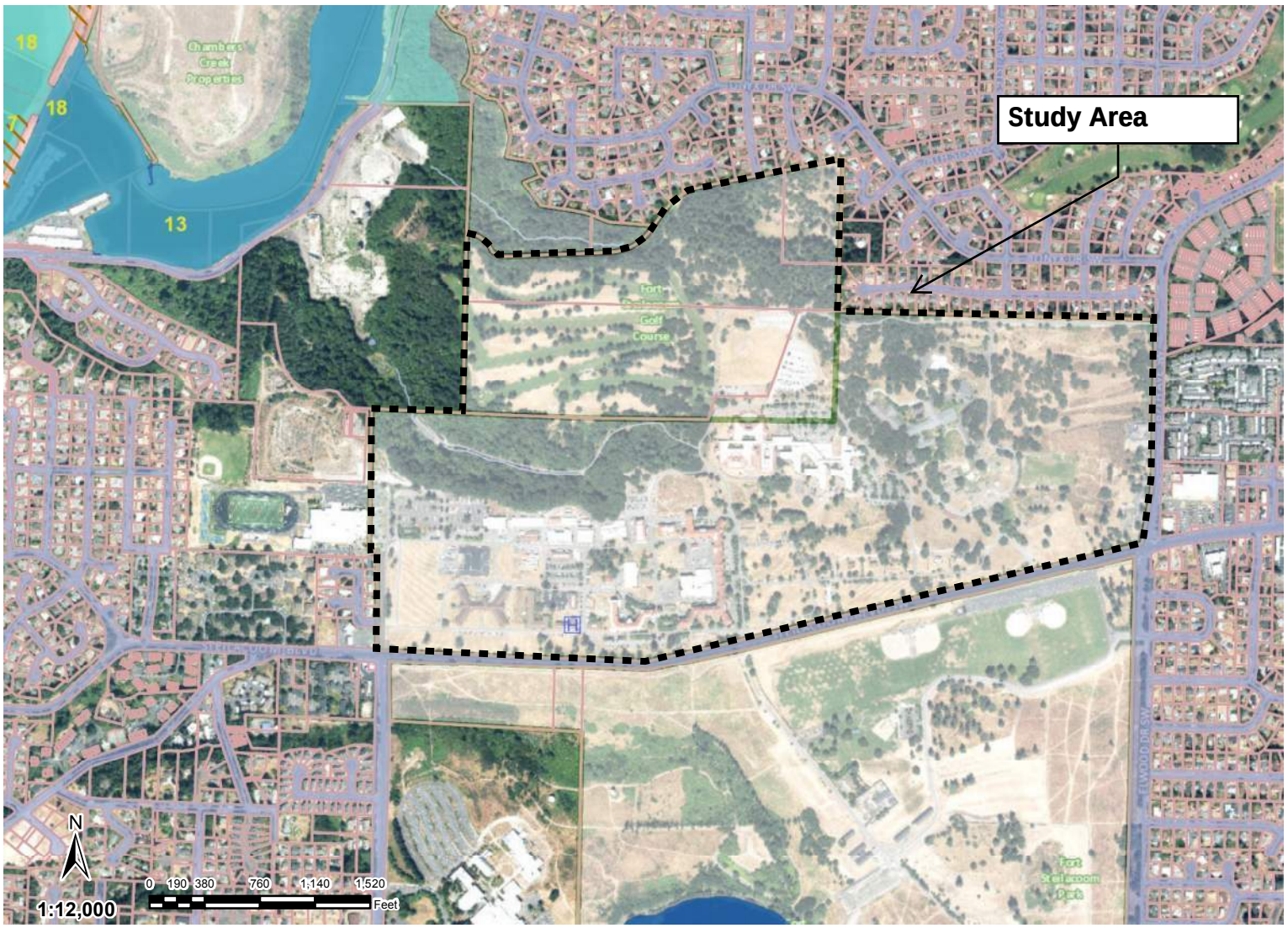
Western State Hospital Master Plan Update

Natural Resource Reconnaissance Memorandum

9601 Steilacoom Blvd SW, Lakewood, WA 98498

FIGURE

3



N

PBS		**PIERCE COUNTY PUBLICGIS MAP** Western State Hospital Master Plan Update Natural Resource Reconnaissance Memorandum 9601 Steilacoom Blvd SW, Lakewood, WA 98498	FIGURE **4**
PROJECT# 41189.001	DATE July 2019		

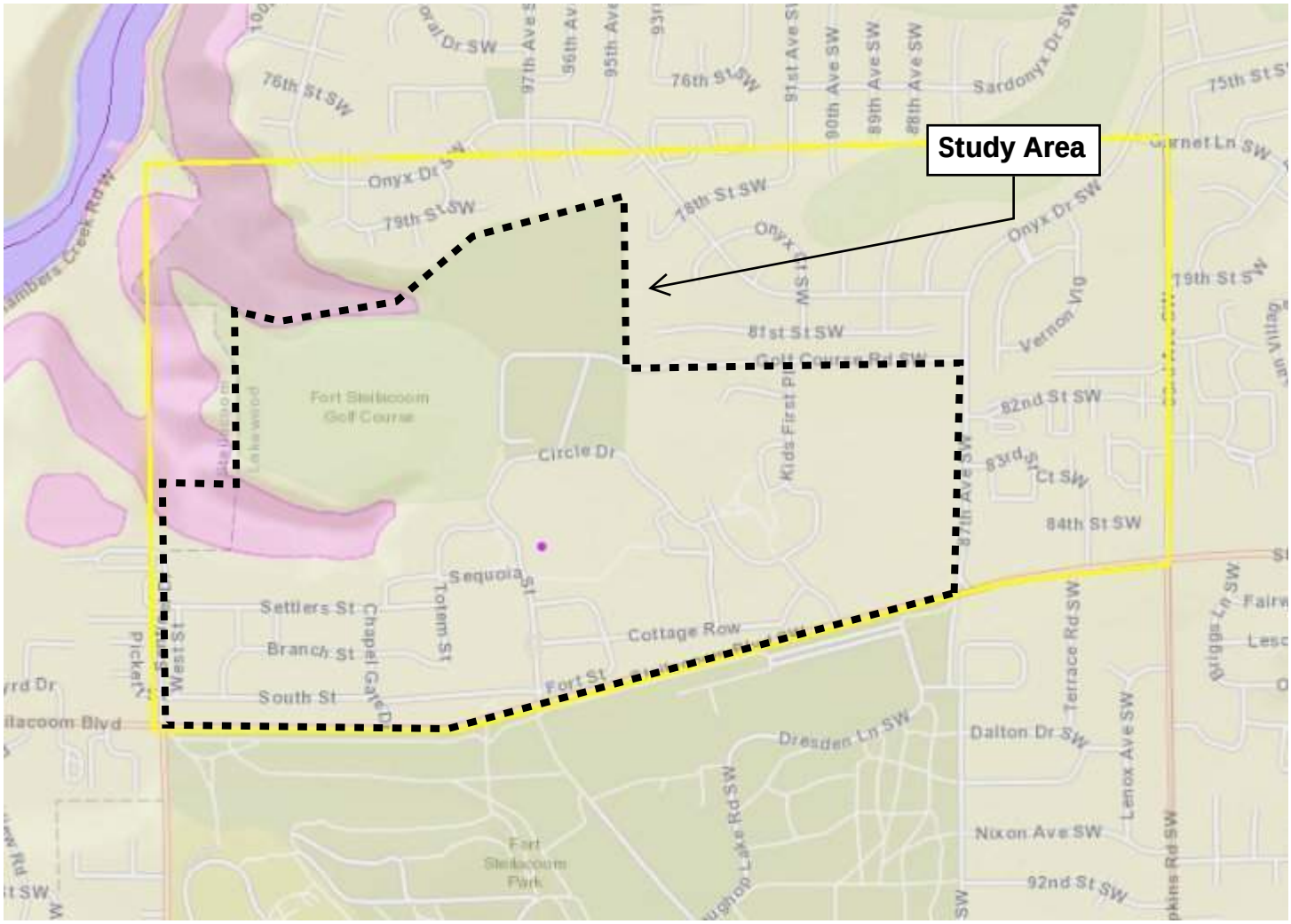
PATCH NAME, PATCH SIZE IN ACRES

PATCH A, 2.7985 AC
PATCH B, 1.9348 AC
PATCH C, 18.3011 AC
PATCH D, 9.5754 AC
PATCH TOTAL: 32.61 AC

N

SOURCE: WDNR GIS OPEN DATA, DATED FEBRUARY 28, 2019

PBS		**OREGON WHITE OAK WOODLANDS MAP** Western State Hospital Master Plan Update Natural Resource Reconnaissance Memorandum 9601 Steilacoom Blvd SW, Lakewood, WA 98498	FIGURE **5**
PROJECT# 41189.001	DATE July 2019		



PBS		WDFW PHS MAP Western State Hospital Master Plan Update Natural Resource Reconnaissance Memorandum 9601 Steilacoom Blvd SW, Lakewood, WA 98498	FIGURE 6
PROJECT# 41189.001	DATE July 2019		

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
PRIORITY HABITATS AND SPECIES REPORT

SOURCE DATASET: PHSPlusPublic Query ID: P190625130711
REPORT DATE: 06/25/2019 1.07

Common Name / Scientific Name / Notes	Site Name / Source Dataset / Source Record / Source Date	Priority Area / Occurrence Type / More Information (URL) / Mgmt Recommendations	Accuracy	Federal Status / State Status / PHS Listing Status	Sensitive Data / Resolution	Source Entity / Geometry Type
Biodiversity Areas And	PUYALLUP STEEP OPEN PHSREGION 902552	Terrestrial Habitat N/A http://wdfw.wa.gov/publications/pub.php?	1/4 mile (Quarter	N/A N/A PHS LISTED	N AS MAPPED	WA Dept. of Fish and Wildlife Polygons
Biodiversity Areas And	PIERCE COUNTY CANDIDATE PHSREGION 902061	Terrestrial Habitat N/A http://wdfw.wa.gov/publications/pub.php?	1/4 mile (Quarter	N/A N/A PHS LISTED	N AS MAPPED	WA Dept. of Fish and Wildlife Polygons
Little Brown Bat Myotis lucifugus	WS_OccurPoint 110873 June 01, 1997	Breeding Area Biotic detection http://wdfw.wa.gov/publications/pub.php?	Map 1:12,000 <= 33	N/A N/A PHS LISTED	Y TOWNSHIP	WA Dept. of Fish and Wildlife Points
Slender-billed white- Sitta carolinensis aculeata	WESTERN WA STATE WS_OccurPoint 113059 January 01, 1983	Breeding Site Biotic detection	1/4 mile (Quarter	N/A Candidate PHS LISTED	N AS MAPPED	WA Dept. of Fish and Wildlife Points
Western Pond Turtle Actinemys marmorata	WS_OccurPoint 110843 October 21, 2007	Occurrence Biotic detection http://wdfw.wa.gov/publications/pub.php?	1/8 mile	N/A Endangered PHS LISTED	Y QTR-TWP	WA Dept. of Fish and Wildlife Points
Western Pond Turtle Actinemys marmorata	WS_OccurPoint 110841 April 19, 2006	Occurrence Biotic detection http://wdfw.wa.gov/publications/pub.php?	1/8 mile	N/A Endangered PHS LISTED	Y QTR-TWP	WA Dept. of Fish and Wildlife Points
Western Pond Turtle Actinemys marmorata	WS_OccurPoint 110840	Occurrence Biotic detection http://wdfw.wa.gov/publications/pub.php?	1/8 mile	N/A Endangered PHS LISTED	Y QTR-TWP	WA Dept. of Fish and Wildlife Points

Common Name Scientific Name Notes	Site Name Source Dataset Source Record Source Date	Priority Area Occurrence Type More Information (URL) Mgmt Recommendations	Accuracy	Federal Status State Status PHS Listing Status	Sensitive Data Resolution	Source Entity Geometry Type
Western Pond Turtle Actinemys marmorata	WS_OccurPoint 110842 November 18, 2006	Occurrence Biotic detection http://wdfw.wa.gov/publications/pub.php?	1/8 mile	N/A Endangered PHS LISTED	Y QTR-TWP	WA Dept. of Fish and Wildlife Points
Western Pond Turtle Actinemys marmorata	PHSREGION 912957	Occurrence Individual occurrence http://wdfw.wa.gov/publications/pub.php?	1/4 mile (Quarter	N/A Endangered PHS LISTED	Y QTR-TWP	WA Dept. of Fish and Wildlife Polygons

Hatcheries and Rearing
- Hatchery
- Rearing Facility

FishTraps
- Trap - Adult
- Trap - Juvenile
- Trap - Unknown Juvenile or Adult
- Major Dams

Spring Chinook ESUs
- Endangered, Accessible
- Endangered, Historical Watershed: Man-Made Blockage
- Threatened, Accessible
- Threatened, Historical Watershed: Man-Made Blockage
- Species of Concern, Accessible
- Species of Concern, Historical Watershed: Man-Made Blockage
- Not Warranted, Accessible
- Not Warranted, Historical Watershed: Man-Made Blockage
- All SalmonScape Species

Culverts
- Total Blockage
- Total Blockage, Fishway Present
- Partial Blockage
- Partial Blockage, Fishway Present
- Unknown Blockage
- Unknown Blockage, Fishway Present

Dams
- Total Blockage
- Total Blockage, Fishway Present
- Partial Blockage
- Partial Blockage, Fishway Present
- Unknown Blockage
- Unknown Blockage, Fishway Present

N

USGS/NHD
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User

PBS

PROJECT# 41189.001

DATE July 2019

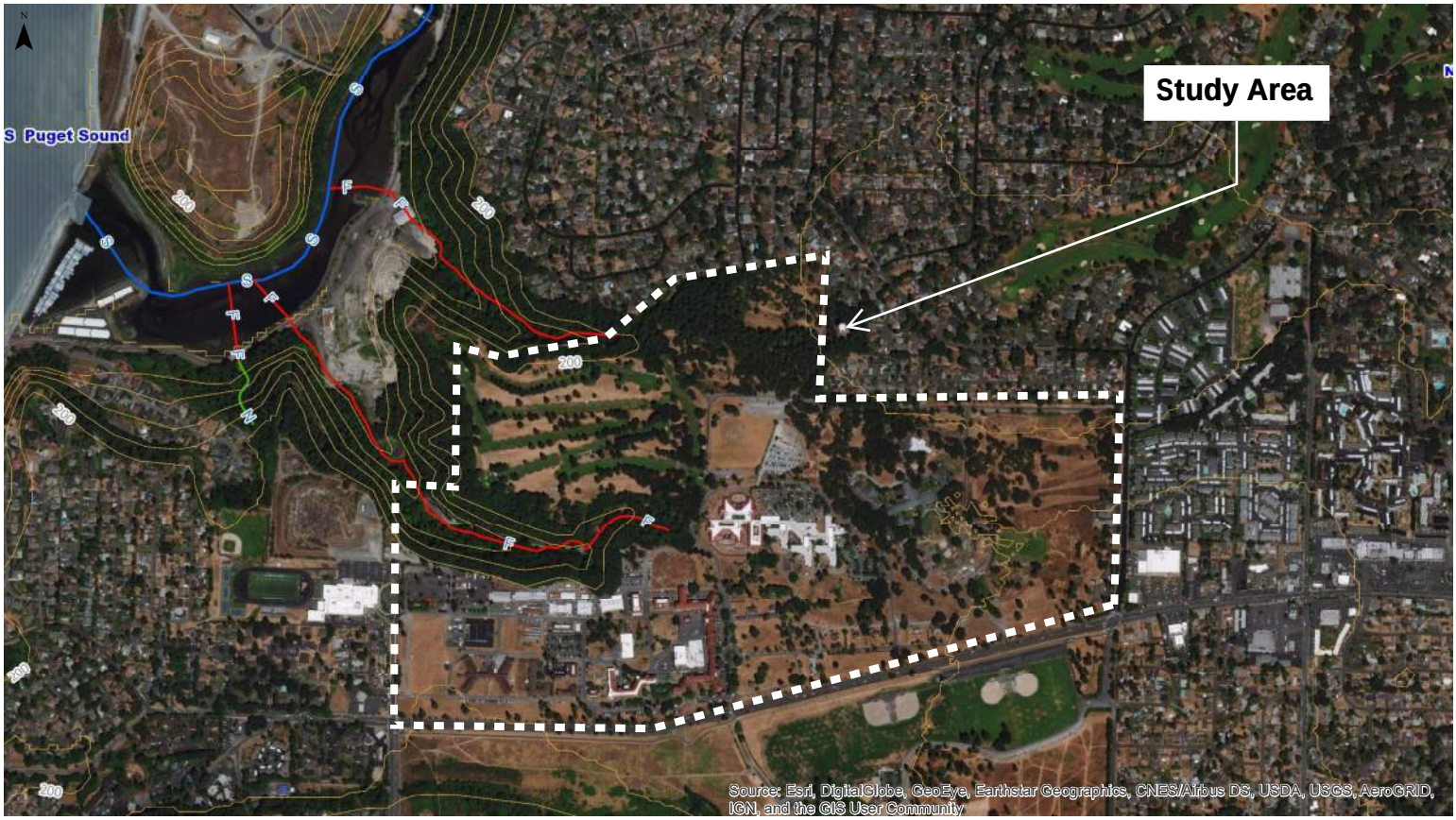
SALMONSCAPE MAP
Western State Hospital Master Plan Update
Natural Resource Reconnaissance Memorandum
9601 Steilacoom Blvd SW, Lakewood, WA 98498

FIGURE
7

PSMFC GIS, Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the

N

PBS			
PROJECT# 41189.001	DATE July 2019	**STREAMNET MAP** Western State Hospital Master Plan Update Natural Resource Reconnaissance Memorandum 9601 Steilacoom Blvd SW, Lakewood, WA 98498	FIGURE **8**

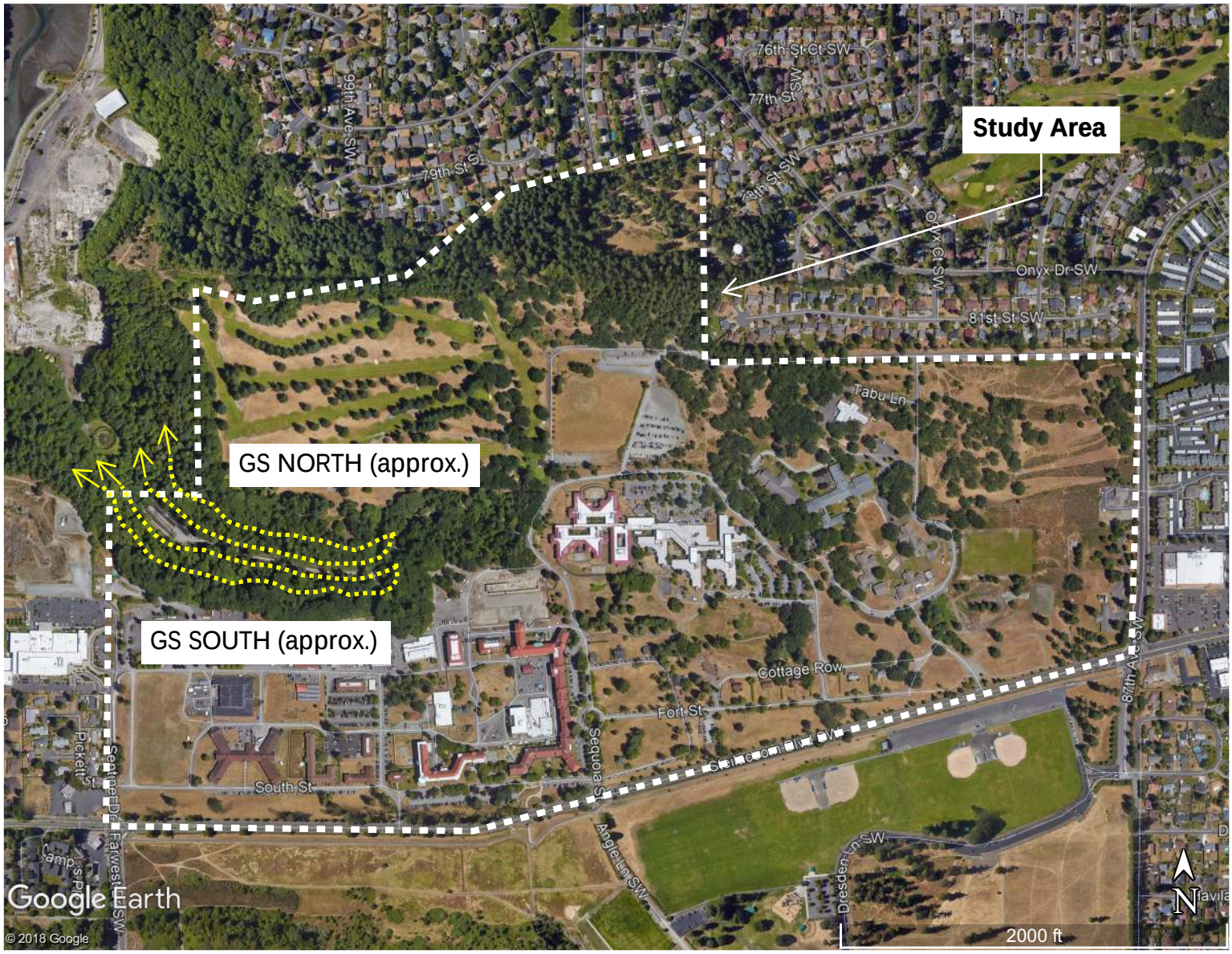


Map Symbols

- Harvest Boundary
- Road Construction
- Stream
- RMZ / WMZ Buffers
- Rock Pit
- Landing
- Waste Area
- Clumped WRTS/GRTS
- Existing Structure

N

PBS		DNR MAPPER Western State Hospital Master Plan Update Natural Resource Reconnaissance Memorandum 9601 Steilacoom Blvd SW, Lakewood, WA 98498	FIGURE 9
PROJECT# 41189.001	DATE July 2019		



Wetland	Wetland HGM Class[1]	Cowardin Classification[2]	Dominant Species Observed	Wetland Hydrology Indicators Observed	Preliminary Wetland Rating[3,4]	Preliminary Buffer Width4[3]
GS South	Slope	Palustrine Forested (PFO)	Red alder, salmonberry, Himalayan blackberry, lady fern, giant horsetail, and English ivy	Saturation at the surface, shallow inundation/surface flows	II/III	60-225
GS North	Slope	Palustrine Forested (PFO)	Red alder, salmonberry, Himalayan blackberry, lady fern, giant horsetail, small-fruited bulrush, and English ivy	Saturation at the surface, shallow inundation/surface flows	II/III	60-225

[1] Hydrogeomorphic classification after Hruby (2014).
[2] Cowardian classification after Cowardin et al. (1979).
[3] Preliminary rating based on Washington State Wetland Rating System for Western Washington (Hruby, 2014).
[4] Local wetland ratings and buffer widths are based on City of Lakewood Municipal Code (LMC) Title 14 – Environmental Protection (LMC 14.162).

PBS

PROJECT# 41189.001

DATE July 2019

WETLAND RECONNAISSANCE MAP
Western State Hospital Master Plan Update
Natural Resource Reconnaissance Memorandum
9601 Steilacoom Blvd SW, Lakewood, WA 98498

FIGURE

10

Appendix A
USFWS IPaC Resource List

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Pierce County, Washington

Local office

Washington Fish And Wildlife Office

(360) 753-9440
(360) 753-9405

510 Desmond Drive Se, Suite 102
Lacey, WA 98503-1263

http://www.fws.gov/wafwo/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Gray Wolf Canis lupus — Proposed Endangered
No critical habitat has been designated for this species.

North American Wolverine Gulo gulo luscus — Proposed Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/5123

Birds

NAME	STATUS
Marbled Murrelet Brachyramphus marmoratus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4467	Threatened
Streaked Horned Lark Eremophila alpestris strigata There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7268	Threatened
Yellow-billed Cuckoo Coccyzus americanus There is **proposed** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Amphibians

NAME	STATUS
Oregon Spotted Frog Rana pretiosa There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6633	Threatened

Fishes

NAME	STATUS
Bull Trout Salvelinus confluentus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/8212	Threatened

Flowering Plants

NAME	STATUS

Golden Paintbrush Castilleja levisecta — Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/7706

Marsh Sandwort Arenaria paludicola — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/2229

Water Howellia Howellia aquatilis — Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/7090

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list

will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Sep 30
Black Turnstone *Arenaria melanocephala* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Great Blue Heron *Ardea herodias fannini* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 15 to Aug 15
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere

Marbled Godwit Limosa fedoa This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Olive-sided Flycatcher Contopus cooperi This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Red-throated Loon Gavia stellata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Rufous Hummingbird selasphorus rufus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds Apr 15 to Jul 15
Western Screech-owl Megascops kennicottii kennicottii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 1 to Jun 30

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week

of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

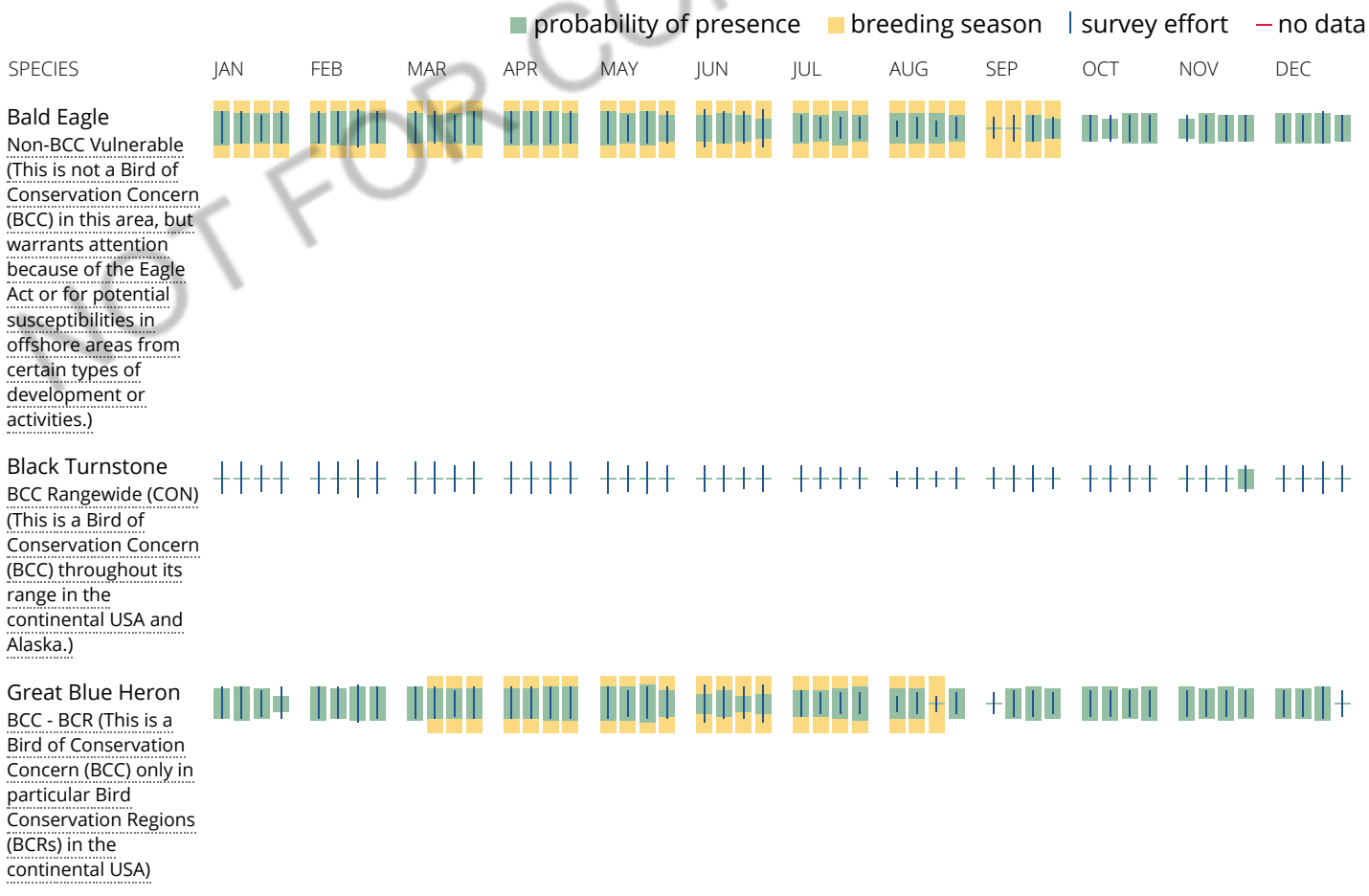
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Lesser Yellowlegs
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Marbled Godwit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Olive-sided Flycatcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Red-throated Loon
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Rufous Hummingbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Western Screech-owl
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review.

Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE

R4SBC

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix 6: Stormwater Credit Feasibility Study

PROJECT MEMO

To:	Mr. Dwight Hollar
From:	Scott Kaul, PE; Jason Isenberg, EIT
AHBL Office:	Tacoma (253) 383-2422
Date:	Sept. 12, 2012
Project:	Western State Hospital - Stormwater Credit Feasibility Study
AHBL No.:	211381.11
Subject:	Stormwater Credit Feasibility

AHBL has performed a feasibility study of the Western State Hospital Campus situated on parcels 0220321000 and 0220321007. The purpose of this study is to evaluate stormwater credit opportunities in conjunction with the City of Lakewood surface water management (SWM) credit program. Stormwater credits will enable the State of Washington to reduce annual stormwater management fees paid to the City of Lakewood. We understand that Western State Hospital is currently assessed an annual surface water management fee of $50,453. Additionally, the City of Lakewood plans to increase the fees for Parcels 0220321000 and 0220321007 in 2013 to $81,952.

To qualify for a surface water management fee credit, both quantity and quality BMP's shall be documented. Acceptable quality BMP's include bio-swales, constructed wetlands, and approved filter vaults. The City of Lakewood allows for surface water fee credits of 35% and 85% for infiltration facilities and 25% and 50% for detention facilities depending on the amount of stormwater retained/detained. If any existing surface water management facilities do not meet the credit requirements it may be beneficial to retrofit the existing facilities in order to receive the credit.

The City of Lakewood has provided AHBL a map which defines impervious areas on each parcel used to calculate stormwater fees. We reviewed this map along with record and design drawings and technical manuals obtained from the City of Lakewood and Pierce County. We conducted a site visit to document existing site conditions relative to stormwater flow control and water quality. We have created a basin map exhibit, C0.1, which outlines impervious areas tributary to identified storm facilities on the campus. This narrative summarizes our understanding of the existing stormwater basins and lists credit opportunities available to the State of Washington in relation to the Western State Hospital Campus.

1. *Legal Offender Unit West*

1.1 Basin Description:

This basin is located in the northern half of the site. It has its own dedicated storm system which collects runoff from the newest Legal Offender Unit expansion and the majority of the north parking lot and conveys it to an infiltration pond on the south side of the building. Stormwater runoff is treated via a biofiltration swale prior to discharging to the infiltration pond. There are 4.58 Ac of impervious surfaces in this basin. This equates to $6,188.64 in stormwater fees for this basin.

1.2 Investigation:

AHBL has a copy of the original design calculations supporting the size of the pond and biofiltration swale. The pond is designed to infiltrate the 100-yr storm. During our site visit, the biofiltration swale was covered with vegetation. There was little evidence of stormwater ponding in the pond.

1.3 "As-is" Credit Potential:

This basin has a defined water quality system and the pond is designed to infiltrate the 100-yr storm. The basin has the potential to achieve a credit of 85% or $5,260.34 with no improvements.

1.4 Recommended Improvements:

There are no recommended improvements for this basin.

2. *Playground Parking*

2.1 Basin Description:

This basin is located in the north-central part of Ft. Steilacoom Park. The basin is comprised parking lot and driveway for the playground and picnic shelters. Stormwater runoff in the parking lot sheet flows to the southwest corner of the parking lot to a grass lined swale. The grass lined swale outfalls to a catch basin with a beehive grate. It appears that this catch basin is connected to an infiltration trench which extends north toward the parking lot. Stormwater runoff from the driveway is collected by at grade infiltration trenches on the north and south side of the driveway. There are approximately 0.84 Ac of impervious surfaces in this basin. This equates to $1,135.03 in stormwater fees for this basin.

2.2 Investigation:

AHBL has not found any design or record drawings for the parking lot or calculations/report for the stormwater system sizing. The actual size of the infiltration trench is unknown.

2.3 "As-is" Credit Potential:

Additional research and survey will need to be conducted to verify the size of the infiltration trench. Once that is accomplished calculations could easily be reproduced justifying max credit for the basin. This would make the basin eligible to receive a credit of $964.78/yr.

2.4 Recommended Improvements:

There are no recommended stormwater improvements for this basin.

3. *Tunnel*

3.1 Basin Description:

This basin is located on the north side of Ft. Steilacoom Park and is comprised of the tunnel access walkways between the WSH campus and Ft. Steilacoom Park. Stormwater runoff is conveyed to one of two drywells, depending on which side of Steilacoom Blvd. it is on. The drywells are

equipped with pumps for emergency overflow conditions. There is no stormwater treatment associated with this basin since there is no pollution generating surfaces. There are approximately 0.10 Ac of impervious surfaces in this basin. This equates to $135.12 in stormwater fees for this basin.

3.2 Investigation:

AHBL has acquired construction plans showing the size of the drywells. However, there are no calculations supporting the size.

3.3 "As-is" Credit Potential:

Calculations justifying the size of the drywells will need to be reproduced. If the calculations show that the drywells infiltrate up to and including the 100-yr storm, the basin is eligible to receive and 85% credit or $114.85/yr.,

3.4 Recommended Improvements:

There are no recommended improvements for this basin.

4. *NW Parking Lot*

4.1 Basin Description:

This basin is located in the NW corner of the site. It has its own dedicated storm system which collects runoff and conveys it to an infiltration pond in the SW corner of the parking lot. There is also a fueling station in the basin that has an oil-water separator to pretreat runoff from the fueling station prior to conveying to the pond. There are 8.31 Ac of impervious surfaces in this basin. This equates to $11,228.73 in stormwater fees.

4.2 Investigation:

AHBL has a copy of the original design calculations supporting the size of the pond. The pond is designed to infiltrate the 100-yr storm. During our site visit, the pond was overgrown with vegetation. The pond appears to be functioning properly as there were no signs observed that might indicate standing water or overtopping.

4.3 "As-is" Credit Potential:

There is no defined stormwater quality system for this basin. An argument can be made that the oil/water separator in combination with the vegetation in the pond provides the necessary water quality treatment. If this is acceptable to the City, the basin could receive a credit of 85% or $9,544.42/Yr.

4.4 Recommended Improvements:

If the existing vegetation treatment argument is not acceptable to the City, a stormwater treatment system will need to be installed to achieve any credit. Our recommendations would be to define a bioinfiltration system within the pond by amending the soils in the pond. To design and install such a system would require further engineering investigation specific to this basin. The approximate cost for such a system is estimated to be $20,000 to $40,000. If it is determined that there is not sufficient room to install such a system, then installing a cartridge-based system such

as Contech Engineered Solutions' Stormfilter Vaults would be required to achieve maximum credit. These types of systems are more easily retrofitted into existing storm drainage systems since they are underground. The cost to install such a system for this basin estimated to cost approximately $250,000 to $350,000 and may not be feasible.

5. *Legal Offender Unit Central*

5.1 Basin Description:

This basin is located in the northern half of the site. It has its own dedicated storm system which collects runoff from the central portion of the Legal Offender Unit buildings, basketball courts, and access road and conveys it to an infiltration pond on the south side of the building. Stormwater treatment is not provided for this basin. There are approximately 1.17 Ac of impervious surfaces in this basin. This equates to $1,580.94 in stormwater fees for this basin.

5.2 Investigation:

AHBL has not found any reports supporting the size of this pond. During our site visit, the pond was covered with vegetation. There was little evidence of stormwater ponding in the pond.

5.3 "As-is" Credit Potential:

There is no defined stormwater quality system for this basin. An argument can be made that the vegetation in the pond provides the necessary water quality treatment. Additionally, calculations justifying the size of the pond will need to be reproduced. If this is acceptable to the City, the basin could receive a credit of 85% or $1,343.80/Yr.

5.4 Recommended Improvements:

If the existing vegetation treatment argument is not acceptable to the City, a stormwater treatment system will need to be installed to achieve any credit. Our recommendations would be to define a bioinfiltration system within the pond by amending the soils in the pond. To design and install such a system would require further engineering investigation specific to this basin. The approximate cost for such a system is estimated to be $5,000 to $10,000. If it is determined that there is not sufficient room to install such a system, then installing a cartridge-based system such as Contech Engineered Solutions' Stormfilter Vaults would be required to achieve maximum credit. These types of systems are more easily retrofitted into existing storm drainage systems since they are underground. The cost to install such a system for this basin estimated to cost approximately $50,000 to $75,000 and may not be feasible.

6. *Legal Offender Unit East*

6.1 Basin Description:

This basin is located in the northern half of the site. It has its own dedicated storm system which collects runoff from the eastern portion of the Legal Offender Unit buildings, parking lot, and eastern access roads and conveys it to an infiltration pond on the south side of the building. Stormwater treatment is not provided for this basin. There are approximately 2.91 Ac of impervious surfaces in this basin. This equates to $3,932.08 in stormwater fees for this basin.

6.2 Investigation:

AHBL has not found any reports supporting the size of this pond. During our site visit, the pond was covered with vegetation. There was little evidence of stormwater ponding in the pond.

6.3 "As-is" Credit Potential:

There is no defined stormwater quality system for this basin. An argument can be made that the vegetation in the pond provides the necessary water quality treatment. Additionally, calculations justifying the size of the pond will need to be reproduced. If this is acceptable to the City, the basin could receive a credit of 85% or $3,342.27/Yr.

6.4 Recommended Improvements:

If the existing vegetation treatment argument is not acceptable to the City, a stormwater treatment system will need to be installed to achieve any credit. Our recommendations would be to define a bioinfiltration system within the pond by amending the soils in the pond. To design and install such a system would require further engineering investigation specific to this basin. The approximate cost for such a system is estimated to be $10,000 to $20,000. If it is determined that there is not sufficient room to install such a system, then installing a cartridge-based system such as Contech Engineered Solutions' Stormfilter Vaults would be required to achieve maximum credit. These types of systems are more easily retrofitted into existing storm drainage systems since they are underground. The cost to install such a system for this basin estimated to cost approximately $75,000 to $100,000 and may not be feasible.

7. *Firwood High School*

7.1 Basin Description:

This basin is located in the northeastern portion of the WSH campus. It has its own dedicated storm system which collects runoff from building 51 and parking lot and conveys it to an infiltration trench on the southwest side of the building. Runoff from the northwest parking lot and access road passes through an oil/water separator prior to entering the infiltration trench. Runoff from the parking lot and access loop on the west side of the building passes through a grass lined swale and oil/water separator prior to entering the infiltration trench. There are 0.99 Ac of impervious surfaces in this basin. This equates to $1,337.72 in stormwater fees for this basin.

7.2 Investigation:

AHBL has a copy of a report supporting the size of the infiltration trench. The calculations do not address the size of the swale or oil/water separators.

7.3 "As-is" Credit Potential:

Oil/water separators are not an approved water quality device. However, an argument can be made that oil/water separators along with the grass lined swale provide some amount of treatment. Calculations justifying this will need to be produced. If this is acceptable to the City, the basin could receive a credit of 85% or $1,137.06/Yr. If meeting the minimum water quality cannot be proven, the City may allow a reduced credit for this basin based on the percentage of water quality achieved.

7.4 Recommended Improvements:

If the treatment argument is not acceptable to the City, a stormwater treatment system will need to be installed to achieve maximum credit. Due to the limited space available be a cartridge-based system such as Contech Engineered Solutions' Stormfilter Vaults would likely be needed. These types of systems are more easily retrofitted into existing storm drainage systems since they are underground. To install such a system would be estimated to cost approximately $40,000 to $60,000 for this basin and may not be feasible.

8. *CSTC*

8.1 Basin Description:

This basin is located in the northeastern portion of the site. It has its own dedicated storm system which collects runoff from the CSTC buildings and parking lot and conveys it to an infiltration pond on the east side of the basin. Stormwater treatment is not provided for this basin. There are approximately 2.85 Ac of impervious surfaces in this basin. This equates to $3,851.01 in stormwater fees for this basin.

8.2 Investigation:

AHBL has not found any reports supporting the size of this pond. During our site visit, the pond was covered with vegetation. There was little evidence of stormwater ponding in the pond.

8.3 "As-is" Credit Potential:

There is no defined stormwater quality system for this basin. An argument can be made that the vegetation in the pond provides the necessary water quality treatment. Additionally, calculations justifying the pond sizing will need to be reproduced. If this is acceptable to the City, the basin could receive a credit of 85% or $3,273.36/Yr.

8.4 Recommended Improvements:

If the existing vegetation treatment argument is not acceptable to the City, a stormwater treatment system will need to be installed to achieve any credit. Our recommendations would be to define a bioinfiltration system within the pond by amending the soils in the pond. To design and install such a system would require further engineering investigation specific to this basin. The approximate cost for such a system is estimated to be $10,000 to $15,000. If it is determined that there is not sufficient room to install such a system, then installing a cartridge-based system such as Contech Engineered Solutions' Stormfilter Vaults would be required to achieve maximum credit. These types of systems are more easily retrofitted into existing storm drainage systems since they are underground. The cost to install such a system for this basin estimated to cost approximately $80,000 to $100,000 and may not be feasible.

9. *WSH Direct Discharge*

9.1 Basin Description:

This basin is located in the western half of the WSH campus. The impervious surfaces in this area are comprised of the PTRC and WSH support and maintenance buildings and associated roads and

parking lots. Runoff from the majority of impervious surfaces in this basin are collected and conveyed to a storm sewer main on the north side of the WSH campus. This storm sewer main outlets at Chambers Creek to the north. There are approximately 21.93 Ac of impervious surfaces in this basin. This equates to $29,632.50 in stormwater fees for this basin.

9.2 Investigation:

AHBL acquired approved design plans for an upgrade to the storm sewer main at the north side of the basin. These plans show elements of the storm drainage system in this basin. No other design or record drawings were found for this basin.

9.3 "As-is" Credit Potential:

Because this system direct discharges, there is no as-is potential for credit in this basin.

9.4 Recommended Improvements:

In order to achieve credits in this basin, infiltration and treatment systems would need to be installed. Our recommendation would be to construct multiple infiltration and treatment systems to manage stormwater runoff from sub-basins within this basin. This approach would allow you to phase construction efforts in this basin. Non-pollution generating impervious surfaces could be directly connected to infiltration trenches. If space allows, runoff from pollution generating impervious surfaces could be directed to bioinfiltration facilities. In instances where space is limited we would recommend installing a cartridge-based system such as Contech Engineered Solutions' Stormfilter Vaults. A stormwater treatment and infiltration system for this basin is estimated to cost $500,000-$1,000,000 for this entire basin. Since biofinfiltration facilities are significantly cheaper that cartridge-based systems, we recommend phasing improvements in this basin to address these areas first. A more in-depth investigation of this basin is required to adequately determine these areas. If such stormwater systems are installed, this basin has the potential to receive a max credit of $25,187.63/yr.

10. *Fire Station*

10.1 Basin Description:

This basin is located in the eastern side of the site along 87th Ave. SW. It encompasses the Lakewood Fire Station 24 building and parking lot. It appears that stormwater runoff from impervious surfaces either disburses in surrounding vegetation or is collected by the storm drainage sewer in 87th Ave. SW. There are approximately 0.82 Ac of impervious surfaces in this basin. This equates to $1,108.01 in stormwater fees for this basin.

10.2 Investigation:

AHBL has not found any reports or record drawings for a storm system for this basin.

10.3 "As-is" Credit Potential:

An argument can be made that areas of runoff are treated and meet infiltration goals. The vegetation in the pond provides the necessary water quality treatment. The site is relatively flat

but it appears that approximately ½ of runoff from the basin is disbursed. A more in depth site survey would need to be conducted to verify this amount.

10.4 Recommended Improvements:

A dedicated stormwater treatment and infiltration system would need to be installed to achieve maximum credit. Due to the relatively flat topography of the site, our recommendation would be to install one or more bioinfiltration systems. If installed, this basin could achieve a credit of 85% or $941.81/Yr. To install such a system would be estimated to cost approximately $15,000 to $30,000 for this basin.

11. *O.G.H.*

11.1 Basin Description:

This basin is located in the eastern side of the site along 87th Ave. SW. It encompasses the Oakwood Group Home buildings, driveway and parking lot. Stormwater runoff from the driveway and parking lot is collected and conveyed to an infiltration trench. Stormwater runoff from the buildings disburses in the surrounding vegetation. There is no stormwater water quality system in this basin. There are approximately 0.61 Ac of impervious surfaces in this basin. This equates to $824.25 in stormwater fees for this basin.

11.2 Investigation:

AHBL has a copy of design plans for the construction of the parking lot and driveway. The plans show the size of the infiltration trench but do not provide calculations supporting its size.

11.3 "As-is" Credit Potential:

Since there is no stormwater treatment facility for this basin, the basin is not eligible for stormwater credit without improvements.

11.4 Recommended Improvements:

In order to achieve maximum credit for this basin, a stormwater treatment system would need to be installed. A cartridge-based system such as Contech Engineered Solutions' Stormfilter Vaults would be required. These types of systems are more easily retrofitted into existing storm drainage systems since they are underground. If a treatment system is installed, the basin would be eligible to receive a credit of $700.61/yr. To install such a system would be estimated to cost approximately $35,000 to $50,000 for this basin and may not be feasible.

12. *Ball field Parking*

12.1 Basin Description:

This basin is located northeast corner of Ft. Steilacoom Park along Steilacoom Blvd. The basin is comprised entirely of the parking lot for the ball fields. Stormwater runoff is collected by a catchbasin located in the center of the parking lot. The stormwater is then conveyed to the

stormwater system in Steilacoom Blvd. There is no stormwater treatment system for this basin. There are approximately 2.14 Ac of impervious surfaces in this basin. This equates to $2,891.63 in stormwater fees for this basin.

12.2 Investigation:

AHBL has not found any design or record drawings for the parking lot.

12.3 "As-is" Credit Potential:

Since stormwater runoff is conveyed to the storm drainage system in Steilacoom Blvd., the basin is not eligible for stormwater credit without improvements.

12.4 Recommended Improvements:

In order to achieve maximum credit, a treatment and infiltration system would need to be installed. Since the parking lot drains to a central point, installing an underground treatment and infiltration system is the most likely choice. This would prevent losing any parking stalls. This could be accomplished with a cartridge-based system such as Contech Engineered Solutions' Stormfilter Vaults and an infiltration trench. These types of systems are more easily retrofitted into existing storm drainage systems since they are underground. If such a system is installed, the basin would be eligible to receive a credit of $2,457.89/yr. To install such a system would be estimated to cost approximately $60,000 to $90,000 for this basin and may not be feasible.

13. ***Park Road***

13.1 Basin Description:

This basin is located in the northeast corner of Ft. Steilacoom Park on the south side of the ball fields. The basin is comprised of a portion of the on-site road which is conveyed to a drywell. There is not stormwater treatment for this basin. Due to the relatively flat topography of the site it is difficult to determine the exact amount of impervious surface in this basin without a more in-depth survey. However, there are approximately 0.42 Ac of impervious surfaces in this basin. This equates to $567.52 in stormwater fees for this basin.

13.2 Investigation:

AHBL has not found any design or record drawings for the park roads or calculations/report for the drywell sizing.

13.3 "As-is" Credit Potential:

Since there is no stormwater treatment for the basin, it is not eligible for stormwater credit as-is.

13.4 Recommended Improvements:

Additional research and survey will need to be conducted to verify the size of the basin and drywell. A stormwater treatment system will need to be installed to achieve any credit. Installing a cartridge-based system such as Contech Engineered Solutions' Stormfilter Vaults would meet this

requirement. These types of systems are more easily retrofitted into existing storm drainage systems since they are underground. This would make the basin eligible to receive a max credit of $482.40/yr. To install such a system would be estimated to cost approximately $20,000 to $30,000 for this basin and may not be feasible.

14. ***Remaining Impervious Surfaces***

14.1 Basin Description:

Additional impervious surfaces exist on the parcels which are not discussed in the above basins. These include roads for the park, WSH cottages, and golf courses; WSH cottages, service buildings for the park and golf courses; gravel parking for the golf courses, park and WSH; paved and gravel trails; and barns on the Ft. Steilacoom Park. None of these areas have a storm drainage system. Runoff from these areas is disbursed in surrounding vegetation areas. The City has assessed a total of 81.08 Ac impervious surfaces for the parcel. By subtracting impervious surfaces of the basins discussed in items 1-13 above from this number, the remaining impervious surfaces is equal to 33.41 Ac. This equates to $45,144.63 in stormwater fees.

14.2 Investigation:

AHBL has not found any as-built information for these remaining impervious surfaces.

14.3 "As-is" Credit Potential:

An argument can be made that disbursal through vegetation provides the needed treatment for the pollution generating impervious surfaces. We have discussed the possibility of this argument with City and they were agreeable. Thus, these remaining impervious surfaces could potentially receive a credit of 85% or $38,372.94/yr.

14.4 Recommended Improvements:

If this argument is not accepted by the City, then treatment would need to be provided to these pollution generating impervious surfaces to achieve maximum credit. Our recommendation would be to construct bioinfiltration systems for these areas. Due to the relatively large amount of these areas, it is difficult to provide an accurate estimate of cost for such areas without a further in-depth engineering investigation. A rough estimate to construct treatment facilities for these areas is $500,000 to $750,000.

Summary:

Within the discussions of the individual basins are discussions of "as-is" credit potential along with recommendations to achieve the maximum credit (85%). The recommendations include our opinion of probable construction costs. Please note that these costs do not include design and permitting costs.

Basins 1, 2, and 3 do not require any stormwater improvements to achieve the maximum stormwater credit. Our recommendation is to apply for credit for these basins first. The combined potential stormwater credit for these basins is $6,339.97/year.

Basins 4, 5, 6, 7, 8 and 14 may not require stormwater improvements to achieve the maximum stormwater credit. These basins will require further engineering investigation and calculations justifying

the size and treatment capacity of existing vegetation. If budget allows, our recommendation is apply for stormwater credit for these basins next. These basins will require additional work and time to develop calculations supporting the stormwater credit application. The combined potential stormwater credit for these basins is $57,013.85/year.

A further in-depth engineering investigation is required for basin 9. Upon further investigation, areas requiring minimal improvements can be determined to achieve stormwater credits from this basin. Our recommendation would be to address improvements and apply for credits in this basin after the basins 1-8 and 14 have been addressed.

The remaining basins will require extensive stormwater improvements to achieve the maximum credit. Our recommendation is to construct improvements for these basins as budget allows. Based on the opinion of probable costs, it will take about 15-20 years of stormwater credit for each basin to recoup the installation cost of the associated stormwater improvement. Due to this relatively long amount of time to recoup costs, these basins may not be feasible to construct stormwater improvements.

We would be happy to assist you in applying for these credits. We have provided you an authorization of services to apply for credit for basins 1, 2, 3 under a separate cover.

If you have any questions, please feel free to contact Matt Weber at (253) 383-2422.

Scott Kaul, PE

c: Todd Sawin, AHBL
Matt Weber, AHBL

Q:\2011\211381\10_CIV\NON_CAD\COMM\OUTgoing\20120911_Feasiblity Memo(REV)_211381.docx

Appendix 7: Patient Release Procedures

The information here is provided in response to questions received during the review process. Procedures are updated periodically, in response to the on-going evolution of patient care.

Civil Commitment Patients

Civil patients leave the hospital after completion of treatment and the development of a thorough discharge plan.

1. Discharge planning occurs between the patient, the treatment team, and community partners.
2. Reviews of the patient's situation prior to admission and their current level of need, help to identify what services might be considered, help the patient have a successful discharge and integration back into the community. At times, the patient may be referred to a needed resource, even if it is not in the county they lived in prior to admission.
3. A packet of information about the patient including their progress, current behaviors, medical issues, the current treatment plans, and other evaluations are provided to any facility considering providing care or housing to the patient. This allows the referred facilility staff to decide whether they can meet the behavioral, medical, and safety needs of the patient. The facility has the ability to decline a referral for any reason.
4. The patient (and/or legal guardian) also has the right to accept or decline any placement or setting for any reason. The patient also has the right to select the city they in which would like to live.
5. Discharge plans generally include: a setting/location, medical care follow up appointments or instructions, psychiatric medication management, outpatient mental health services, and/or substance use treatment.

Forensic Commitment Patients

The Behavioral Health Administration serves two populations within the forensic mental health system:

1. Individuals pleading Not Guilty by Reason of Insanity (NGRI)
2. Individuals entering the system due to criminal charges when the court has ordered a competency evaluation.

In this context, competency is the ability for the person to understand the court process and their ability to participate in their own defense as it relates to a mental disorder. The court may order competency restoration treatment when the court determines the individual lacks competency.

Hospital staff perform an assessment at the end of treatment to determine if competency has been restored. When competency is restored, the individual is returned to jail to complete the legal process. Discharge planning efforts for these individuals are determined by the courts and outside the control of DSHS. These persons would not discharge immediately to the community.

There are two other potential outcomes for these competency restoration cases when the individual is found to be "not restorable." "Not restorable" means that the person, due to their mental disorder, cannot understand or participate in the legal process. At that point, the court may dismiss their charges (although they can do so "without prejudice" which allows them to re-file the charges once the person becomes ready to transition to the community) and order that an evaluation for involuntary psychiatric treatment occur. Those evaluations are provided by DSHS.

If an individual is found to meet criteria for involuntary treatment due to danger to self or others, or due to a grave disability, the individual is moved to a civil (non-forensic) treatment program. Upon completion of treatment, he/she would go through the same discharge process as outlined above under PATIENT DISCHARGE PROCEDURES. Those individuals who do not meet the criteria for further inpatient treatment are released to the community. DSHS makes a diligent effort prior to release to connect them to resources in the community to assist with their transition. Nonetheless, DSHS cannot legally hold the person for any additional time once DSHS has made the determination that the person does not meet the criteria for involuntary civil commitment.

Individuals within the Not Guilty by Reason of Insanity program, receive similar discharge planning efforts as does the civil population. The court decides when forensic patients are released back to the community. Due to their NGRI conviction, these cases have significant amounts of oversight including a Risk Review Board, the Public Safety Review Panel, and a BHA Assistant Secretary review that occurs as the person progresses through the program. Their release is called a conditional release and DSHS continues to monitor these cases after release and can initiate a recommendation to the court that they be returned to the hospital for additional treatment if they are not meeting the conditions of their release.

Appendix 8: SEPA Checklist

This appendix includes a checklist addressing the State Environmental Protection Act (*SEPA") criteria. The text includes instructions and questions, preserving the format of the list, as well as the project team's responses. Note that figures referenced follow the narrative of the checklist.

PURPOSE OF CHECKLIST:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

INSTRUCTIONS FOR APPLICANTS:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

INSTRUCTIONS FOR LEAD AGENCIES:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

USE OF CHECKLIST FOR NON-PROJECT PROPOSALS:

For non-project proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NON-PROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. BACKGROUND

1. *Name of proposed project, if applicable:*

   Western State Hospital Master Plan

2. *Name of applicant:*

   Department of Social and Health Services

   Facilities, Financial, & Analytics Administration – Office of Capital Programs

3. *Address and phone number of applicant and contact person:*

   Bob Hubenthal, Assistant Director, Capital Facilities Management
   Department of Social and Health Services
   Facilities, Finance and Analytics Administration
   PO Box 45848
   Olympia, WA 98504
   360.902.8168 robert.hubenthal@dshs.wa .gov

   Aarón Martínez, Capital Projects Manager
   Office of Capital Programs Department of Social and Health Services
   Facilities, Finance and Analytics Administration
   PO Box45848
   Olympia, WA 98504
   360.902.8325 Aaron.Martinez@dshs.wa.gov

4. *Date checklist prepared: 20-January-2020 - revised 17-November -2020*

5. *Agency requesting checklist: City of Lakewood*

6. *Proposed timing or schedule (including phasing, if applicable):*

   The major development under this master plan - a new forensic hospital - is projected to begin in approximately 6 years. A residential treatment facility is a potential secondary use and would also be expected in the second half of the ten-year planning horizon of this master plan.

7. *Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.*

   No. The Master Plan incorporates the currently proposed additions and expansion to the existing facilities anticipated for the 10-year planning period.

8. *List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.*

   - Natural Resources Evaluation: Western State Hospital Master Plan (PBS 2019*);
   - Subsurface Exploration, Geologic Hazard, Infiltration Study, and Geotechnical Engineering Report, Western State Hospital New Patient Support Center (Associated Earth Sciences, Inc. 2017);
   - Western State Hospital Cultural Landscape Assessment (Artifacts Architectural Consulting 2008)
   - Western State Hospital Cultural Resource Management Plan (Artifacts Architectural Consulting 2011)
   - Traffic Study: Western State Hospital Master Plan (TSI 2020);
   - Utility Review: Western State Hospital Master Plan (AEI 2020)

9. *Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.*

   No applications are pending for governmental approval of other proposals affecting the WSH Campus.

10. *List any government approvals or permits that will be needed for your proposal, if known.*

    The Master Plan is not anticipated to require additional permits or approvals. Individual projects to be constructed as part of the implementation of the Master Plan will require site specific permits. The individual permits may include the following City of Lakewood permits and approvals:

    - Boundary Line Adjustment
    - Building, Electrical, Mechanical and Plumbing permits
    - Clearing and Grading
    - Construction Stormwater General Permit
    - Critical Areas Review
    - Demolition

* PBS Environmental, Natural Resource Evaluation for WSH Master Plan, October, 2019

- Drainage Review
- Land Use Modification
- Master Facilities Plan Modification
- Right-of-way
- SEPA
- Site Development Permit

The Master Plan does not anticipate impacts to wetlands, waters, habitats, or species that would require additional state or federal permits.

11. *Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)*

Western State Hospital (WSH) provides evaluation and inpatient treatment for individuals with serious or long-term mental illness, including patients referred through their Behavioral Health Organization, the civil court system (when individuals meet the criteria for involuntary treatment under RCW 71.05), or through the criminal justice system (RCW 10.77).

Patient Population, Capacity and Staff Levels

WSH currently provides more than beds 900 for these patients, and the master plan projects that actual beds in use would drop to no more than 820 beds. However, as demolition and conversion plans may not occur immediately after existing beds are vacated, actual bed capacity could at times be higher than projected demand for services.

As detailed in the master plan document, the peak capacity for beds on the campus at any point in the ten-year planning cycle is 996. For this reason, population-related impacts in this report consider up to this 1,000-bed capacity as the basis of impact analysis.

WSH also employs approximately 2,200 staff members, making it the fourth largest employer in the City of Lakewood.

Planned Development

DSHS is engaged in an ongoing master planning effort for the WSH Campus to: incorporate changing facility needs; address the growth management issues of stakeholders (including Pierce County and the City of Lakewood); and streamline the permitting process for future projects.

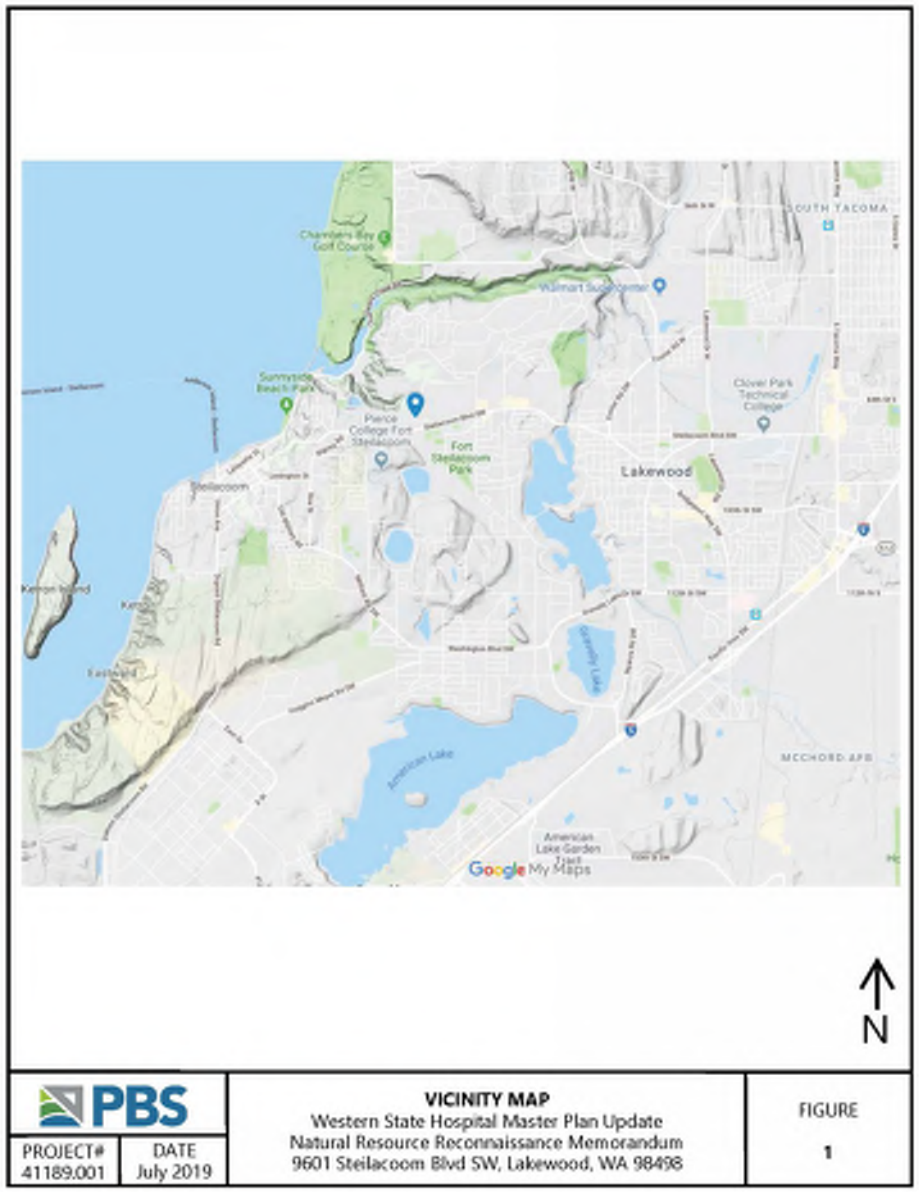
The initial master plan for the campus was approved by the City in 1998 and is based on a 10-year planning period. An update to the Master Plan was prepared in 2008, and the latest planning efforts were initiated in 2018.

As part of the current master planning update, DSHS has evaluated several alternatives for layout of the campus, including rehabilitating existing buildings and constructing new facilities. Siting Alternatives for the proposed new forensic hospital are described in “Appendix 7: Patient Release Procedures”.

12. *Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.*

Western State Hospital is located in the City of Lakewood, Washington, see Figure 1. The site abuts the north side of Steilacoom Boulevard SW, extending from 87th Avenue SW on the east to Sentinel Drive on the west. The Campus extends northward from Steilacoom Boulevard SW to Golf course Road SW on the east side to approximately 79th Street SW on the west. The Public Land Survey System location is Sections 33, 43, and 48, Township 20 North, Range 2 East. The campus totals approximately 288 acres, and is composed for four separate tax parcels, described below.

- The largest parcel (0220321022) is 215.71 acres is size, and includes the frontage of Steilacoom Boulevard SW from 87th Avenue SW westward to Sentinel Drive. This parcel contains most of the developed portions of the campus, as well as Garrison Springs and the associated forested valley slopes.



- The second parcel (0220321007) is 36.73 acres in size, and extends northward from Garrison Springs. This parcel includes the majority of the Fort Steilacoom Golf Course, now closed.
- The third parcel (0220283027) is 29.75 acres in size, and is located to the north of Parcel 0220321007. This parcel includes the northern ¼ of the Fort Steilacoom Golf Course, the forested valley slope to the north, and the forested disc golf course area to the east.
- The last parcel (0220283026) is located at the northeastern-most corner of the site and is 6.15 acres in size. The parcel is also part of the former golf course.

B. ENVIRONMENTAL ELEMENTS

1 EARTH

a. *General description of the site:*

The Campus is primarily upland terraces with slopes less than 15 percent; with the overall topography sloping gently from the southeast corner to the northwest corner.

Flat, rolling, hilly, steep slopes, mountainous, other

b. *What is the steepest slope on the site (approximate percent slope)?*

The forested valley slopes to the north and south of the golf course contain slopes of up to 70 percent inclination, with localized sections as steep as 100 percent inclinations (Associated Earth Sciences, Inc. 2017).

c. *What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.*

Three soil mapping units were identified in the study area: Spanaway gravelly sandy loam; Everett very gravelly sandy loam; and Xerochrepts (PBS 2019). A summary of the characteristics is provided in Table 1.

Spanaway soils occur at elevations from 200 to 590 feet and are typically used for woodland, pasture, cropland, homesites, and

Table 1: Soils present in the Study Area*:

Symbol	Map Unit Name	Slope	Landform	Parent Material	Drainage Class	Soils hydric? Hydric inclusions?
41A	Spanaway gravelly sandy loam	0 to 15%	Terraces and plains	Glacial outwash	Somewhat excessively drained	No (15% Spana, Yes)
13D	Everett very gravelly sandy loam	15 to 30%	Outwash terraces and escarpments, kames, moraines, eskers	Glacial outwash	Somewhat excessively drained	No (10% Alderwood, No but may support wetlands in some situations) (10% Indianola, No)
47F	Xerochrepts	45 to 70%	Valley sides	Sandy and gravelly outwash and/or glacial till	Well drained	No

* 1 NRCS, 2019b.

wildlife habitat (NRCS, 2019b). Spanaway gravelly sandy loam is not considered a hydric (wetland) soil by the National Technical Committee for Hydric Soils (NTCHS).

Everett soils occur at elevations from 30 to 900 feet and are typically used for livestock grazing, timber production, and urban development (PBS 2019). Everett very gravelly sandy loam is not considered a hydric soil by the NTCHS, however this soil unit does include slopes of 15 to 30 percent.

Xerochrept soils occur at elevations from 0 to 980 feet on steep valley sides; these soils are not considered hydric soils by NTCHS, however this soil unit does include slopes of 45 to 70 percent.

The Geotechnical Report prepared for a portion of the Campus indicated the area includes fill soils from 2 to 15 feet in depth, likely underlain by recessional outwash, with advance outwash at lower elevation (Associated Earth Sciences, Inc. 2017). This is consistent with the soil mapping described above.

d. *Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.*

Portions of the Garrison Creek valley slope are composed of gravelly soils subject to seepage and meet the City of Lakewood definition for Landslide Hazard Areas (Associated Earth Sciences, Inc. 2017). The valley slope on the north side of the Campus is similarly steep, and is expected to have similar characteristics to the valley slope along Garrison Creek. The Individual projects included in the Master Plan will provide site specific geotechnical studies (if appropriate) and will be designed to avoid steep areas that may contain unstable soils or landslide hazards.

e *Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.*

The proposed Master Plan is a planning level document, and as a result does not include the level of detail necessary to calculate filling,

excavation, or grading quantities. The individual projects will calculate grading quantities and disturbance areas on a site by site basis. Any fill used on the Campus will be consist of clean fill material obtained for approved sources.

f. *Could erosion occur as a result of clearing, construction, or use? If so, generally describe.*

No erosion would occur from ongoing use of the campus or as a result of the approval of the Master Plan. Individual projects in the Master Plan are expected to result in clearing, excavating, and grading that will expose soils and have the potential to result in erosion.

g. *About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?*

The Master Plan will not result in change in impervious surfaces at the WSH Campus. Full implementation of the individual projects in the Master Plan will result in a change of impervious surface from 18.9% percent to 19.6 percent with the new hospital and western parking; this would increase to 20.6 percent if the potential Residential Treatment Facility (RTF) and adjacent parking were built.

h. *Proposed measures to reduce or control erosion, or other impacts to the earth, if any:*

The individual projects within the Master Plan will include site-specific Construction Storm Water Pollution Prevention (CSWPP) and Temporary Erosion and Sediment Control (TESC) Plans. These plans will incorporate Best Management Practices such as the establishment of stable construction entrances, placement of sediment fences, installation of control measures to cover exposed earth, use of wattles and checkdams, ongoing monitoring of stormwater runoff, etc. The project Contractor will adopt those plans and will to execute and amend the plan as necessary. The implementation of robust CSWPPP and TESC plans is anticipated to successfully control the potential for erosion and ensure compliance with Department of Ecology Construction Stormwater regulations.

2. AIR

a. *What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.*

Implementation of the individual projects in the Master Plan would result in construction related emissions. Anticipated emission sources would include use of construction equipment, dust from excavation and grading, and chemical odors from asphalt paving operations. These construction-related emissions are expected to be temporary in nature, and of short-term in duration. We anticipate that any operational increase in emission from vehicles using the Campus after project completion will be negligible.

b. *Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.*

None.

c. *Proposed measures to reduce or control emissions or other impacts to air, if any:*

Mitigation would include reasonable precautions to avoid fugitive dust emissions, including application of water or dust-binding chemicals to bare soils during dry weather, street and vehicle cleaning to prevent mud, dirt and other debris on paved roadways and planting of paving areas that would be exposed for prolonged periods of time. Construction equipment would be maintained in good repair. After project completion, vehicular traffic is not expected to significantly increase.

3. WATER

a. Surface Water:

1.) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes – two wetlands and two streams were identified on or in close proximity to the campus. Details of these surface waters are provided below.

Wetlands

Two wetlands (GS South and GS North) were identified within or in the immediate vicinity of the project area. Table 2 describes these wetlands, and summarizes the Cowardin classification, hydrogeomorphic class, and preliminary rating and buffer width per LMC 14.162.080.

Wetlands GS North and GS South are slope wetlands associated with the Garrison Springs riparian corridor. Numerous areas of seepage were observed on the valley walls upslope of the stream during

Table 3: Potential Streams present at the Site and Preliminary Ratings

Stream	Flows to	Preliminary Stream Rating*	Preliminary Buffer Width†
Garrison Springs	Chambers Creek	Perennial, Fish-bearing (Type F)	65-150
Unnamed Tributary to Chambers Creek	Chambers Creek	Perennial, Fish-bearing (Type F)	65-150

* Water typing based on definition per 14.165.010
† Local stream ratings and buffer widths are based on Lakewood's Shoreline Master Program (SMP) Chapter 4 Section C.

Table 2: Potential Wetlands Present at the Site with Preliminary Ratings and Buffers

Wetland	Wetland HGM Class*	Cowardin Classification†	Dominant Species Observed	Wetland Hydrology Indicators Observed	Preliminary Wetland Rating‡§	Preliminary Buffer Width
GS South	Slope	Palustrine Forested (PFO)	Red alder, salmonberry, Himalayan blackberry, lady fern, giant horsetail, and English ivy	Saturation at the surface, shallow inundation/surface flows	II/III	60-225
GS North	Slope	Palustrine Forested (PFO)	Red alder, salmonberry, Himalayan blackberry, lady fern, giant horsetail, small-fruited bulrush, and English ivy	Saturation at the surface, shallow inundation/surface flows	II/III	60-225

* Hydrogeomorphic classification after Hruby (2014).
† Cowardian classification after Cowardin et al. (1979).
‡ Preliminary rating based on Washington State Wetland Rating System for Western Washington (Hruby, 2014).
§ Local wetland ratings and buffer widths are based on City of Lakewood Municipal Code (LMC) Title 14 – Environmental Protection (LMC 14.162).

the site visit, and these areas were dominated by wetland plant species. Preliminary wetland ratings were completed with the 2014 Washington State Wetland Rating System for Western Washington, consistent with LMC 14.162.030. Both wetlands fall on the margin of the Category II/III. Buffers for wetland with these ratings range from 60-225 feet, depending on the habitat score.

Streams

Two streams were identified within the Study Area: Garrison Springs and an Unnamed Tributary to Chambers Creek. A summary of the characteristics of these streams and preliminary stream rating and buffer widths are provided in Table 3.

Garrison Springs/Garrison Creek is located in the central west portion of the WSH Campus. Garrison Springs, is a perennial stream, originating from seeps on the steep slopes on the western portion of the Campus and flowing northwest to the Garrison Springs Hatchery and the Chambers Creek Estuary on Puget Sound. Garrison Springs is approximately 5-15 feet wide at the ordinary high water mark and appeared to be channelized adjacent to the access road which provides access to the hatchery.

Current habitat in the stream is predominantly riffle and run type. Pools are largely limited to the areas above man-made structures on the stream. The stream substrate is primarily gravels with some fines, and the banks are somewhat incised. Mixed forest canopy and forested slope wetlands provided 100 percent canopy coverage, except where interrupted by the hatchery access road. The stream flows beneath Chambers Creek Road, entering Chambers Creek through a concrete box outfall with a steel rack that limits access.

The unnamed stream is a tributary to Chambers Creek and is located beyond the Campus northern property line. As a result, most of the stream could not be evaluated during the site assessment. However, water could be heard flowing the deep, steep sided valley located to the north of the Fort Steilacoom Golf Course.

The lower reach of this stream appears to be piped beneath the abandoned industrial facility at Chambers Creek Road. Several seeps areas were also identified in this area, and a concrete pipe outfall was located on the estuary of Chambers Creek, which likely represents the terminus of this stream. Flows were present at the outfall in July 2019, indicating that flows in this stream are likely perennial. Aerial imagery shows a densely vegetated, mixed forest riparian canopy in the riparian area, extending from the disc golf area northwest to Chambers Creek Road.

Individual Master Plan projects that require State or federal funding or permits will be required to assess the presence of wetlands and streams prior to funding or permit approval. More detailed field studies would be conducted at this time.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No work is proposed in or over waters. Some individual projects on the Campus may be constructed within 200 feet of Garrison Creek or associated wetlands.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected.

Indicate the source of fill material.

None.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

5) *Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.*

No work is proposed within a 100-year floodplains.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No waste material would be discharged to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed

uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

The WSH Campus currently uses water from wells located in Garrison Springs. The Master Plan anticipates that in future, the WSH Campus will transfer control of these wells to the Lakewood Water District, and future water needs at the Campus will be supplied by the District.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged into the ground water. Waste from the WSH Campus includes domestic sewage and hospital waste, and the currently served population includes approximately 900 patients and 2,800 employees. The WSH Campus waste needs are currently provided by the Town of Steilacoom Sewer Utility.

Under the proposed Master Plan, the type of waste would not change. The served population would include approximately 820 patients - with a maximum capacity of approximately 1,000 beds† - and 2,700 employees. The WSH Campus waste needs would continue to be provided by the Town of Steilacoom Sewer Utility, which has sufficient capacity for the proposed increases.

c. *Water runoff (including stormwater):*

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Anticipated sources of stormwater runoff on the Campus include building roofs, surface parking lots, and internal roadways. Runoff will be collected and disposed of on-site using a combination of pervious pavements, porous concrete, bioretention cells, and roof drain infiltration galleries. All stormwater runoff will be managed and infiltrated on-site.

2) *Could waste materials enter ground or surface waters? If so, generally describe.*

It is unlikely that waste material would enter ground or surface waters. Waste material from project construction would be removed from the site and treated appropriately. Any toxic substances such as fuel, lubricants, hydraulic fluids, paint, solvents, and cleaning materials will be isolated from water on the site and disposed of at an appropriate off-site facility. Operation sewage waste be will be collected and piped off-site for treatment at Town of Steilacoom Sewer Utility facilities, and hospital waste will be removed from the site and properly disposed of at an approved facility. Construction related and operational stormwater will be conveyed to treatment facilities on-site.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

Site drainage proposed in the Master Plan designed to follow the existing site drainage basins and is not expected to alter on-site drainage patterns.

d. *Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:*

The Master Plan anticipates that stormwater from the Campus will be infiltrated on site to minimize the impact on drainage patterns.

† See “Patient Population, Capacity and Staff Levels” on page A8-3

4. PLANTS

a. Check the types of vegetation found on the site:

_**X**_ deciduous tree: alder, maple, aspen, other

_**X**_ evergreen tree: fir, cedar, pine, other

_**X**_ shrubs

_**X**_ grass

____pasture

____crop or grain

____ Orchards, vineyards or other permanent crops.

_**X**_ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other

____water plants: water lily, eelgrass, milfoil, other

____other types of vegetation

The majority of the campus is developed, and vegetation in these areas consists of maintained lawn area with landscape trees. Species present in this area include:

- common domestic grasses (bent grasses [*Agrostis sp.*], bluegrasses [Poa sp.], fescues [*Festuca sp.*], and rye grasses [Lolium sp.])
- disturbance tolerant forbs (e.g. common dandelion [*Taraxicum officinale*], hairy cat's ear [*Hypocharis radicat*a], sheep sorrel [*Rumex acetosella*], etc.),
- landscape trees (domestic cherry and flowering plums [*Prunus sp.*], European horse-chestnut [*Aesculus hippocastanum*], Norway maple [*Acer platanoides*], and Tree-of-Heaven [*Alianthus altissima*]),
- scattered native trees (Douglas fir [*Pseudotsuga menziesii*], Sitka spruce [*Picea sitchensis*], and copses of Oregon white oak (*Quercus garryana*).

The Fort Steilacoom Golf Course is located the northwest corner of the property, and is also maintained as grass, with scattered native coniferous trees and Oregon White Oak.

The disc golf area (NW) has a similar canopy to the golf course. In the open areas, the shrub community is dominated by Scot's broom (*Cytissus scoparius*).

Table 4: Native Plants on the WSH Campus

Stratum	Common Name (Scientific Name)
Tree	Bigleaf maple (Acer macrophyllum) Oregon white oak (Quercus garryana) Red alder (Alnus rubra)
Shrub	California dewberry (Rubus ursinus) Dull Oregon grape (Berberis nervosa) Oceanspray (Holodiscus discolor) Salmonberry (Rubus spectabilis) Snowberry (Symphicarpos albus) Vine maple (Acer circinatum)
Herbaceous	Giant horsetail (Equisetum telmateia) Orchard grass (Dactylis glomerata) Sword fern, or Pineland sword fern (Polystichum munitum) Western lady fern (Athyrium cyclosorum)

In areas where the canopy is denser, the dominant shrub species include California dewberry (*Rubus ursinus*), dull Oregon grape (*Berberis nervosa*), evergreen blackberry (*Rubus laciniatus*), Himalayan blackberry (*Rubus armeniacus*), and snowberry (*Symphicarpos albus*).

In the two ravine areas, the vegetation consists of a mixture of native and non-native species. The dominant species present include:

- red alder (*Alnus rubra*) and bigleaf maple (*Acer macrophyllum*) in the canopy, and

Table 5: Native Plants on the WSH Campus

Common Name	Scientific Name	Federal ESA Listing Status	Critical Habitat Designated?
Golden Paintbrush	*Castilleja levisecta*	Threatened	No
Marsh Sandwort	*Arenaria paludicola*	Endangered	No
Water Howellia	*Howellia aquatilis*	Threatened	No

- California dewberry (*Rubus ursinus*), dull Oregon grape, evergreen blackberry, Himalayan blackberry, oceanspray (*Holodiscus discolor*), salmonberry (*Rubus spectabilis*), snowberry, and vine maple (*Acer circinatum*).

Dominant herbaceous species present include giant horsetail (*Equisetum telmateia*), orchard grass (Dactylis glomerata), reed cararygrass (*Phalaris arundinacea*), Pineland sword fern (*Polystichum munitum*), and western lady fern (*Athyrium cyclosorum*).

Mapping from the WDNR Natural Resources Heritage Program identifies a single native plant community as present on or near the WSH Campus. This plant community is Oregon white oak dominated or co-dominated canopies. This community occurs in four locations on the Western State Hospital Campus: two on the eastern end of the Fort Steilacoom Golf Course near Garrison Springs, and two to the east one either side of Kids First Lane.

Table 4 presents a list of the native trees, shrubs, and herbaceous species identified on the WSH Campus during the field evaluation.

b. What kind and amount of vegetation will be removed or altered?

Projects considered in the Master Plan are concentrated in the developed portions of the Campus. Specific areas of vegetation removal would be determined for each of the individual projects, but the total affected areas are:

- approximately 3 acres of miscellaneous lawns and landscaping in the area of the new forensic hospital
- approximately 4 acres for the potential Residential Treatment Facility, which is mostly vegetated, but also include 2 cottages to be removed
- approximately 2/3 acre for the cottage at the CSTC complex
- approximately 1/3 acre for the Treatment and Recreational Facility at CSTC

The affected vegetation will include grasses and forbs in the landscaped lawn areas (bent grass, bluegrass, fescue, rye grass, common dandelion, hairy cat's ear, sheep sorrel, etc.), and landscape trees (domestic cherry and flowering plums, European horse-chestnut, Norway maple, and Tree-of-Heaven). Native tree than may be affected include Douglas fir, Sitka spruce, and Oregon white oak.

c. List threatened and endangered species known to be on or near the site.

Endangered Species Act Listed Plants

A review of information from the USFWS IPaC database (Appendix A) identified three federally threatened or endangered plant species as potentially present in the vicinity of the project. These species are listed in Table 5.

Golden paintbrush is listed as Threatened under the ESA and is found in native northwest grasslands. There are no current or historic populations in Pierce County. Marsh sandwort is listed as Endangered under the ESA. This species is found in swamps, wetlands, and freshwater marshes along the coast. In western Washington, water howellia occurs in low-elevation wetlands and small vernal pools (PBS, 2019).

The field reconnaissance did not identify any individuals of golden paintbrush, marsh sandwort or water howellia on the WSH campus. However, the protocols for identification of ESA plants require multiple field visits conducted over several years and timed to match the emergence/flowering of the target species.

Individual projects in the Master Plan will conduct more comprehensive field studies to determine the presence or absence of ESA listed plants as appropriate.

Rare and Sensitive Plant Species

The WDNR Natural Resources Heritage Program website identifies three rare or sensitive species as potentially present on or near the

Table 6: Rare and Sensitive Plant Species

Common Name	Scientific Name	Historic or Current presence?	Washington State Status	Potential habitat present?
White-top aster	*Seriocarpus rigidus*	Current	Sensitive	Yes
Common bluecup	*Githopsis specularioides*	Historic	Sensitive	Possible
Giant chain fern	*Woodwardia fimbriata*	Historic	Sensitive	Yes

WSH Campus. Characteristics of these species are described listed in Table 6.

White-top aster is found in relatively flat, open grasslands of lowlands in gravelly, glacial outwash soils (WDNR, 2019c). White-top aster is mapped as occurring in the northeast corner of the WSH Campus and has been identified by WDNR as present on the WSH Campus as recently as August 13, 2010 (PBS 2019).

Common bluecup is historically found in the vicinity of the WSH Campus. This species is found in dry, open places in lowlands, such as grassy balds, talus slopes, and gravelly prairies. There are no recent observations of common bluecup in Pierce County, and none of the habitats that support this species are present on the Campus.

Giant chain fern is historically found in the vicinity of the WSH Campus. This species is found in stream banks, shaded wet road banks, the edges of bogs, and wet bluffs amongst coniferous trees and adjacent to saltwater. Similar habitats are present on the Western State Hospital Campus and nearby.

The field reconnaissance did not identify any individuals of White-top aster,common bluecup, or giant chain fern. However, the protocols for identification of rare and sensitive species may require multiple field visits timed to match the emergence/flowering of the target species. Considering the relatively recent identification of white-top aster (August 2010), this species should be presumed to be present.

Individual projects in the Master Plan will conduct more comprehensive field studies for the presence of rare and sensitive plant species.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

The master plan includes recommendations to reduce impacts on protecting species such as the White Oak. Areas of cultivated landscape will generally be near building entries and within courtyards used for recreation. Open areas of the site will be maintained as open space, with minimal disturbance. *e. List all noxious weeds and invasive species known to be on or near the site.*

No Class A noxious weeds were identified on the WSH Campus during the field investigation. Scattered knapweed specimens were present on the site, but were not positively identified as C. biebersteinii, and a number of Class B and C noxious weeds were identified on the Campus. A summary of the noxious weeds and invasive species known to be on or near the site is presented in Table 7.

Individual projects in the Master Plan will meet Pierce County and City of Lakewood regulations for control of noxious and invasive weeds.

Table 7: Noxious, Invasive, and Non-Native Plants

Common Name	Scientific Name
Class A Noxious Weed	*Scattered knapweed specimens were present on the site, but were not positively identified as C. biebersteinii.*
Class B Noxious Weed	*Scot's broom (Cytissus scoparius)**
Class C Noxious Weed	*English ivy (Hedera helix)* *Evergreen blackberry (Rubus laciniatus)** *Hairy cat's ear (Hypochaeris radicata)* *Himalayan blackberry (Rubus armeniacus)** *Reed canarygrass (Phalaris arundinacea)* * *Tree of Heaven (Alianthus altissima)*
Non-regulated, non-native species	*Bentgrasses (Agrostis sp.)* *Bluegrass (Poa sp.)* *Cherry (likely cultivar varieties of the genus Prunus)* *Common sheep sorrel (Rumex acetosella)* *Eastern redcedar (Juniperus virginiana)* *European horse-chestnut (Aesculus hippocastanum)* *Fescue grasses (Festuca sp.)* *Flowering plum (varieties of the genus Prunus)* *Lanceleaf plantain (Plantago lanceolata)* *Norway Maple (Acer platanoides)*

* Non-regulated noxious weed per Pierce County Noxious Weed Control Board.

5. ANIMALS

a. *List any birds and other animals which have been observed on or near the site or are known to be on or near the site.*

Examples include:

birds: hawk, heron, eagle, songbirds, other:

mammals: deer, bear, elk, beaver, other:

fish: bass, salmon, trout, herring, shellfish, other

The only positive wildlife identifications during the field evaluation were woodpeckers (identified by their sound), squirrels (likely eastern gray squirrel [*Sciurus carolinensis*] or eastern fox squirrel *[Sciurus niger*]), and American crow (*Corvus brachyrhynchos*).

However, considering the large size of the site and the presence of relatively undisturbed riparian areas in close proximity to Puget Sound, we would anticipate a variety of wildlife species that are adapted to proximity with suburban human populations, such as rats, mice, voles and similar rodents; North American raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), and passerine bird species.

Deer (*Odocoileus sp.*) and coyote (*Canis latrans*) and were not observed on the Campus, but are likely present due the proximity of the riparian habitats on and near the Campus to Chambers Creek estuary, which supports a variety of fish and wildlife species. A brief reconnaissance of the estuary area positively identified deer, great blue heron (*Ardea herodias*), and bald eagle (*Haliaeetus leucocephalus*).

b. *List any threatened and endangered species known to be on or near the site.*

Table 8: Federal and State-Listed Habitats and Species

Common Name	Scientific Name	Status	Critical Habitat Designated?
Puget Sound Chinook Salmon	*Oncorhynchus tshawytscha*	Federally Threatened	Yes
Puget Sound Steelhead	*O. mykiss*	Federally Threatened	Yes
Puget Sound-Coastal Bull Trout	*Salvelinus confluentus*	Federally Threatened	Yes
Gray wolf	*Canus lupus*	Federally Endangered (Proposed)	No
Marbled murrelet	*Brachyramphus marmoratus*	Federally Threatened	Yes
Streaked horned lark	*Eremophila alpestris strigata*	Federally Threatened	Yes
Yellow-billed cuckoo	*Coccyzus americanus*	Federally Threatened	Proposed
Oregon spotted frog	*Rana pretiosa*	Federally Threatened	Yes
Biodiversity area	*N/A*	State Priority Habitat	N/A
Little brown bat	*Myotis lucifugus*	State Priority Species	N/A
Slender-billed white-breasted nuthatch	*Sitta carolinensis aculeata*	State Candidate Species	N/A
Western Pond Turtle	*Actinemys marmorata*	State Endangered	N/A

Federal and State-Listed Habitats and Species

The USFWS IPaC website (Appendix A), NOAA Fisheries ESA listings, and WDFW PHS data identify several federally and state threatened or endangered species, as well as priority habitats and species in the vicinity of the project. The results are presented in Table 8.

Salmonscape and StreamNet were also reviewed for presence of anadromous fish, but no habitat was identified in either database.

Suburban developed areas in the Puget Sound do not provide suitable, usable habitat for large terrestrial predators such as Gray wolf or North American Wolverine. Oregon spotted frog requires relatively large areas of emergent wetland that are not present on the Campus.

Table 9: Migratory Bird Species

Common Name	Scientific Name	Breeding Season*
Bald Eagle	*Haliaeetus leucocephalus*	January 1 – September 30
Black Turnstone	*Arenaria melanocephala*	Breeds elsewhere†
Great Blue Heron	*Ardea herodias fannini*	March – August 15
Lesser Yellowlegs	*Tringa flavipes*	Breeds elsewhere‡
Marbled Godwit	*Limosa fedoa*	Breeds elsewhere§
Olive-sided Flycatcher	*Contopus cooperi*	May 20 – August 31
Red-throated Loon	*Gavia stellate*	Breeds elsewhere¶
Rufous Hummingbird	*Selasphorous rufus*	April 15 – July 15
Western Screech-owl	*Megascops kennicottii kennicottii*	March 1 – June 30

* Noted by USFWS to be a liberal estimate of breeding season
† Indicates the species does not likely breed within project area
‡ *ibid*
§ *ibid*
¶ *ibid*

Exposed gravel areas to the site could provide potential habitat for streaked horned lark, but the frequency of disturbance on the Campus makes nesting by this species unlikely. Nearby marine areas could potentially provide foraging habitat for marbled murrelet. Habitat suitable for use by yellow-billed cuckoo includes large tracts of riparian habitat with small trees and shrubs suitable for nesting. Some areas of similar riparian habitat are present on the Campus and nearby. Future projects should assume that streaked horned lark, marbled murrelet, yellow-billed cuckoo or suitable habitats may be present and should conduct more detailed studies.

Streams on the Campus and nearby have long culverted sections or other man-made barriers that preclude use by listed anadromous ESA listed fish species (Chinook salmon, steelhead, and bull trout). However, these species are present in Puget Sound and likely use the nearby areas of Chambers Creek. As a result, future projects should assume the potential for impact to these species.

The riparian areas along Garrison Springs and the unnamed tributary to Chambers Creek meet the definition of biodiversity areas and would be protected as critical areas. Similarly, habitats for little brown bat, slender-billed white-breasted nuthatch (mapped on the site) western pond turtle (mapped in the vicinity) would also need to be considered by future projects.

Migratory Bird Act and the Bald and Golden Eagle Protection Act

The USFWS IPaC website (See PBS 2019) identified several species protected under the Migratory Bird Ac as potentially present in the vicinity of the Campus. These species area are listed in Table 9.

Potential impacts to these migratory birds during their breeding season would need to be considered by future projects.

Individual Master Plan projects at the Campus should conduct site specific field studies to identify ESA listed, priority, and critical species and habitats in the immediate project vicinity.

Critical Fish and Wildlife Species and Habitats

LMC 14.154.020 identifies a list of 11 critical fish and wildlife species and habitats, five of which are occur on or near the Campus. Table 10 provides details on these critical fish and wildlife species and habitats present at the WSH Campus.

c. *Is the site part of a migration route? If so, explain.*

Yes. The site is part of the Pacific Flyway for migratory birds. Fish species may also use the downstream portions of the streams may provide habitat for migratory fish species.

d. *Proposed measures to preserve or enhance wildlife, if any:*

The proposed WSH Master Plan retains approximately 48 acres of wildlife habitat in its current condition. The preserved habitat includes Oregon White Oak habitat (much of which is currently used for active and passive recreation), wetlands, streams, and riparian areas on or abutting the campus.

e. *List any invasive animal species known to be on or near the site.*

No invasive animals are known to be present on the WSH Campus.

6. ENERGY AND NATURAL RESOURCES

a. *What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.*

Electricity, natural gas, gasoline and diesel fuel will be used to power construction equipment.

Individual projects are expected to use electricity (provided by Tacoma Power) to provide power to the building's electrical components and natural gas (provided by Puget Sound Energy) for heating buildings or water on the campus.

Currently many campus facilities are heated by steam from a central boiler room, with boilers fueled by natural gas. The plan recommends further study to develop strategies to reduce reliance on natural gas, in response to the State's Net Zero policy.

b. *Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.*

No. There is significant open space around the site that no built features will shade neighboring properties. Within the site, development density will allow future facilities to have building-integrated or ground-mounted photovoltaic facilities and effective solar orientation.

c. *What kinds of energy conservation features are included in the plans of this proposal?*

List other proposed measures to reduce or control energy impacts, if any:

Individual projects implemented as part of the Master Plan will include energy modeling and mechanical LEED services.

Table 10: Critical Fish and Wildlife Species and Habitats

Habitats and Species of Local Importance	Description
Priority Oregon white oak woodlands	*WDNR identifies four patches of either oak-dominant forest or woodland canopy, or urban oak canopy (Figure 5). The four patches (32.61 ac. total) were identified in the northern half of the property.*
Snag-rich areas	*Snag-rich areas are likely to occur in the stream riparian areas.*
Rivers and streams with critical fisheries	*Rivers and streams with critical fisheries on or near the Campus.*
Waters of the state, including all water bodies classified by the Washington Department of Natural Resources (DNR) water typing classification system as detailed in WAC 222-16-030, together with associated riparian areas	*WDNR Forest Practices Application Mapping Tool identifies Garrison Springs and the unnamed tributary to Chambers Creek within the Study Area (*
Lakes, ponds, streams, and rivers planted with game fish by a governmental entity or tribal entity.	*Garrison Springs Hatchery may meet the requirements of this habitat of local importance, the hatchery is run by WDFW (WDFW, 2019b).*

7. ENVIRONMENTAL HEALTH

a. *Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.*

1) Describe any known or possible contamination at the site from present or past uses.

A campus-wide study for environmental health hazards has not yet been completed, however the site is known to be within the boundaries of the Tacoma Smelter Plume.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

None were identified.

*3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the projec*t.

Transportation fuel for construction equipment will be used and may be stored on site during construction in compliance with State regulations for proper equipment storage. Other toxic chemicals that may be required for construction (such as pesticides, herbicides, fertilizers, etc.) will be stored and used in accordance with all federal, state and local regulations.

4) Describe special emergency services that might be required.

No special emergency services are anticipated to be required for the Master Plan or the individual projects implemented under the Master Plan. A safety plan which will include emergency spill responses in compliance with State regulations will be provided. The completed project will be served by typical public emergency services.

5) Proposed measures to reduce or control environmental health hazards, if any:

Master Plan projects will conduct soil sampling for arsenic and lead following the 2012 Tacoma Smelter Plume Guidance. Subsequent actions in response to testing results will comply with the Model Toxics Control Act (MTCA) cleanup requirements in (Chapter 173-340 WAC).

Site designs for the individual projects will include protective measures to isolate or remove contaminated soils from public spaces, yards, and children's play areas, and any contaminated soils will be managed and disposed of in accordance with state and local regulations, including the Solid Waste Handling Standards regulation (Chapter 173-350 WAC).

Site specific studies will also be completed to determine the presence of any other contaminants at Master Plan project sites.

b. *Noise*

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Land uses surrounding the WSH Campus are primarily residential and park/public open space. As a result, existing noise in the vicinity is largely the result of traffic on the roads in the immediate vicinity.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Short-term noise would result from the use of construction equipment such as trucks, machinery and excavation activities during daylight hours. Long-term operational noise is limited to vehicular traffic using the parking lot and access roads. Use of the parking lots and access roads would occur primarily during daylight hours and at shift changes.

3) Proposed measures to reduce or control noise impacts, if any:

Construction will only occur during daylight hours to minimize the impact of short term noise disturbances. Long-term noise disturbances will be minimized in compliance with local noise ordinances.

8. LAND AND SHORELINE USE

a. *What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.*

The WSH Campus is currently used as a hospital facility and provides mental healthcare services for patients in western Washington State. The campus includes the Hospital facilities, support facilities for the heathcare facilities, and open space.

The proposed Master Plan will not change the use of the facility, and the proposed Master Plan incorporates a more compact facility footprint to allow for greater security. As a result, the proposed Master Plan and the subsequent project are not expected to alter the land uses on nearby properties.

The hospital is an Essential Public Facility as defined by the State, and is being developed on land zoned for this type of use.

b. *Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to non-farm or non-forest use?*

While there was some production gardening by patients of the hospital in its early history, the WSH Campus has not been used as working farmland or working forest land for over 40 years.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No, the project will not affect or be affected by surrounding working farm or forest lands.

c. *Describe any structures on the site.*

There are approximately 60 buildings on the site, built up over more than a century, and totaling approximately 1,435,000 SF. These are detailed in Table 3 and Figures 11 and 12 (pp. 1-17) of the Master Plan document.

d. *Will any structures be demolished? If so, what?*

Yes, several outmoded structures are proposed for demolition, totaling up to 150,000 SF. These are described in the report and summarized in Figure 17 of the Master Plan document.

e. *What is the current zoning classification of the site?*

The WSH Campus is currently zoned Public Institutional and Open Space/Recreation (1) by the City of Lakewood.

f. *What is the current comprehensive plan designation of the site?*

The current comprehensive plan designation of the Campus includes Public Institutional and Open Space designations.

g. *If applicable, what is the current shoreline master program designation of the site?*

Not applicable; project site is not located within 200 feet of a shoreline.

h. *Has any part of the site been classified as a critical area by the city or county? If so, specify.*

Yes, portions of the WSH Campus and the abutting lands includes areas designated as geologically hazardous areas (erosion hazard and/or landslide hazard areas), critical aquifer recharge area, wetlands, and streams (Garrison Creek and a second unnamed stream located immediately to the north of the Campus). The Campus also includes several habitats and species of local importance (Priority Oregon white oak woodlands, Snag-rich areas, rivers and streams with critical fisheries, waters of the state together with associated riparian areas, and Lakes, ponds, streams, and rivers planted with game fish by a governmental entity or tribal entity).

i. *Approximately how many people would reside or work in the completed project?*

The health-care facilities are projected to serve 820 patients- and a maximum capacity of up 1,000 beds‡ - as well as a staff of approximately 2,700.

‡ See "Patient Population, Capacity and Staff Levels" on page A8-3 for explanation of population and capacity.

j. Approximately how many people would the completed project displace?

Approval of the Master Plan and construction of the individual projects will not result in displacement.

k. Proposed measures to avoid or reduce displacement impacts, if any:

None proposed. The Master Plan and construction of the individual projects will not result in displacement.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The Master Plan helps establish a more compact layout for the major facility on the WSH campus. In combination with the other revisions to the Master Plan, the facility siting will support:

- Improved security for patients and neighbors, with fewer patients circulating between buildings;
- Preservation of open space on the Campus;
- Improved traffic flow;
- More efficient utility supply, and;
- Improved accessibility.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

None proposed. The Master Plan and construction of the individual projects will not result in impacts to agricultural and forest lands.

9. HOUSING

a. *Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.*

While residential accommodations are provided for patients in treatment these accommodations are not considered general housing.

b. *Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.*

None.

c. *Proposed measures to reduce or control housing impacts, if any:*

None proposed. The Master Plan and construction of the individual projects will not result in housing impacts.

10. AESTHETICS

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The new hospital in expected to be three stories in height, with a maximum of five stories. It would be of comparable height to existing buildings on the site.

b. What views in the immediate vicinity would be altered or obstructed?

The primary buildings will be on a site area that is previously developed. Existing views are not expected to be altered significantly.

c. Proposed measures to reduce or control aesthetic impacts, if any:

The design intent will include massing the building to create courtyards and other features that will benefit patients and reduce the apparent scale of the facility.

11. LIGHT AND GLARE

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The proposed Master Plan improvements will include interior and exterior lighting fixtures attached to the building and in parking areas. Interior lighting would be on during all hours of the day, and exterior building lights, roadway and parking lot lighting would be on during evening, night and early morning hours for safety.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Light from the proposed Master Plan improvements is not expected to be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

Off-site sources of light or glare may result from adjacent street and traffic lighting; these sources are not expected may affect the WSH Campus or facilities.

d. *Proposed measures to reduce or control light and glare impacts, if any:*

Light from the proposed Master Plan improvements will be directed at pedestrian walkways, parking lots, and access roads to minimize the effects of light and glare on nearby uses and wildlife.

12. RECREATION

a. *What designated and informal recreational opportunities are in the immediate vicinity?*

The Campus and publicly accessible properties on the vicinity provide a variety of active and passive recreational opportunities including baseball, bicycling, bird watching, disc golf, running, and walking.

These recreation opportunities are available on Campus at the former ballfields and Fort Steilacoom Golf Course (accessible during daylight hours from 87th Avenue SW), and off-site at Fort Steilacoom Park (south of Steilacoom Boulevard SW) and the Chambers Creek Canyon Park (north of the Campus).

b. *Would the proposed project displace any existing recreational uses? If so, describe.*

The proposed Master Plan improvements are not expected to have permanent impacts to off-campus recreational uses would preserve the existing open space at the former Fort Steilacoom Golf Course and nearby areas currently used for disc golf. Construction of the individual projects in the Master Plan may result in temporary and short-term changes to site access to preserve the safety of recreational users and construction crews.

c. *Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:*

Access changes resulting from the proposed Master Plan improvements will be minimized to the maximum extend possible while maintaining the safety of recreational users and workers at the Campus.

13. HISTORIC AND CULTURAL PRESERVATION

a. *Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.*

The WSH site presents a complex layering of historic functions with an extensive set of prehistoric, historic, and non-historic features (including archaeological sites, buildings, structures, objects, landscape elements, etc.) spread across the vast expanse of an 882-acre site. These activities encompass a broad time period from aboriginal use, Hudson Bay and early exploration by the 1830s, settlement by the 1840s, Fort Steilacoom by 1849, and hospital and institutional farm uses by 1871 (*Artifacts Architectural Consulting*, 2008).

Portions of the Campus area listed to the National Register of Historic Places (NRHP) and Washington Heritage Register (WHR) as the Fort Steilacoom Historic District on November 25, 1977. The NRHP listing was amended on December 16, 1991.

Culturally significant feature identified at the site include two prehistoric sites, Fort Steilacoom, associated cemeteries, 36 extant buildings dating from the period from the 1850's to the 1960's, and 17 additional structures including monuments and accessory buildings.

These buildings and structures are described in detail in the Western State Hospital Cultural Landscape Assessment (Artifacts Architectural Consulting 2008).

b. *Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.*

Yes. Two prehistoric sites and three historic cemeteries (military, settler, and hospital) are present in the area. Additional detail is provided in the Western State Hospital Cultural Landscape Assessment (Artifacts Architectural Consulting 2008).

c. *Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include*

consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

WSH has retained archaeological and cultural resource specialist to prepare documents to document the archaeological and cultural history of the WSH Campus and vicinity. Documents prepared include:

- Western State Hospital Cultural Landscape Assessment (Artifacts Architectural Consulting 2008)
- Western State Hospital Cultural Resource Management Plan (Artifacts Architectural Consulting 2011)

d. *Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.*

The master plan calls for protection of the historical resources associated with the 19th Century history of the site, including the Fort Steilacoom era and the early hospital era. These include the Settlers' Cemetery, and potentially the early morgue and bakery buildings.

DSHS will work with the Fort Steilacoom Historical Association to support protection and interpretation of the extant Fort-era facilities.

For facilities from the hospital's expansion phases, DSHS will document facilities prior to any demolition or major alteration.

14. TRANSPORTATION

a. *Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.*

Steilacoom Boulevard is the primary street serving the site. To the east, 87th Avenue SW is the campus boundary and to the west, Sentinel Drive is the boundary.

b. *Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?*

Pierce Transit provides bus transit to the primary site entry. A bus route connects WSH to both central Steilacoom to the west and the Lakewood Transit Center to the east. From the transit center, transfers can be made to other destinations in Pierce Transit's service area.

c. *How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?*

The project will provide an additional 334 parking spaces, for a total of 1,993. This will allow WSH to reduce the incidence of informal parking in non-designated areas, and will better accommodate shift overlap periods.

d. *Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).*

The WSH master plan recommends changes to the internal circulation system that would lead to relocation of the primary vehicular access points. These changes are proposed to increase separation of access drives, while improving campus wayfinding. The changes are not required, but projected to be beneficial to the near-campus flow of traffic.

e. *Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.*

These will not be a significant mode of travel for staff, visitors or deliveries to the site.

f. *How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and non-passenger vehicles). What data or transportation models were used to make these estimates?*

Based on the targeted populations on the WSH campus, 5,709 trips on average would be generated to and from the site on weekdays. This represents a 6% reduction from current measured traffic. Peaks are projected as follows:

- 677 trips from 7:00-8:00 a.m., 5% down from existing
- 366 trips, from 4:00-5:00 p.m., 6% down from existing

Additional detail on the study methodology and projected travel patterns is provided in "Appendices 3A & 3B: Transportation Impact Analysis" The TIA also includes interim scenarios that address the impacts of potentially higher populations in interim periods over the planning timeframe.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

h. Proposed measures to reduce or control transportation impacts, if any:

WSH will continue to participate in the Commute Trip Reduction (CTR) program. Primary programs include transit passes, carpool and vanpool support, employer-provided transit passes and supporting programs such as a guaranteed ride home.

As documented in the 2019 CRT report, initiatives for near term expansion include expanding the vanpool program and further coordination with Pierce Transit.

15. PUBLIC SERVICES

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The proposed Master Plan improvements will not result in an increased need for public services, including fire protection, police protection, public transit, health care, or schools.

b. Proposed measures to reduce or control direct impacts on public services, if any.

None proposed. The proposed Master Plan improvements will not result in an increased need for public services.

16. UTILITIES

a. Circle utilities currently available at the site: (underlined)

electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other: steam heat

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Current services include: Tacoma Power (electricity) and Puget Sound Energy (natural gas); current facilities are provided water from an on-site well system; future facilities will be connected to the Lakewood Water District's system.

These systems and their capacities are further described in the master plan report; see "Utilities & Infrastructure" on page 43.

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee _____

Position and Agency/Organization _____

Date Submitted: _____

D. Supplemental sheet for non-project actions

(IT IS NOT NECESSARY to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. *How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?*

   Operation of the WSH Campus is not expected to result in increases in discharges to ground or surface waters. Operational emissions to air result from the use of motor vehicles on the WSH Campus and operation of heating, ventilation, and air conditioning equipment, which produce minimal emissions. Similarly, the Campus operations do not produce any of toxic or hazardous substances. The WSH Campus does not use industrial machinery, so the operational noise generated on the Campus is largely the result of vehicular traffic and the operation of HVAC equipment. The associated noise levels of these machines are typically low, and are consistent with the Public Institutional land use.

   The project incorporates a variety of approaches to reduce the impact of the WSH Campus to the environment, including: on-site infiltration of stormwater; implementation of Best Management Practices to control construction-related erosion and sedimentation, and to contain toxic or hazardous materials used during construction; and application of appropriate site clean-up measures for any identified -toxic or hazardous materials.

   Proposed measures to avoid or reduce such increases are:

   Operational measure to avoid or decrease discharges include:

   - On-site stormwater treatment and infiltration;
   - Application of green building technology to reduce energy needs and potential emissions;
   - Implementation of operational safety standards for the storage of toxic or hazardous substances to prevent accidental release; and

2. *How would the proposal be likely to affect plants, animals, fish, or marine life?*

   Removal of vegetation would be necessary in order to construct the new buildings proposed in the Master Plan. Vegetation to be removed is dominated by maintained lawns and horticultural tree species, although some Oregon white oak are present. The loss of this vegetation has the potential to affect some species of animals.

   Since the project will not require work in wetland or streams, impacts to buffers will be avoided or minimized, and best management practices will be used to address stormwater issues on the site, fish and marine life would not be affected by the Master Plan improvements.

   Proposed measures to protect or conserve plants, animals, fish, or marine life are:

   Development of the Campus and removal of vegetation is concentrated in the previously developed portions of the Campus, which will minimize the loss of vegetation. Replacement of notable trees (particularly Oregon white oak) would be developed in consultation with the City and other stakeholders.

   In addition to efforts to minimize the footprint of the new development, existing open space on the Campus would be retained. The former Fort Steilacoom Golf Course (72.6 acres) and an area use d by the community as a current disc golf course (approximately 15 acres, SE loop) would be preserved. These two active recreational uses represent about 30 percent of the campus.

3. *How would the proposal be likely to deplete energy or natural resources?*

   Proposed measures to protect or conserve energy and natural resources are:

   - New facilities will be developed to contemporary standards, reducing their consumption.
   - Development of campus will also follow the State's Net Zero policy.
   - Over the long-term, the intent is to retire the natural gas fired steam boilers in favor of more sustainable energy sources.

4. *How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for*

governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

The proposed Master Plan improvements have been located in areas that avoid impacts to streams, wetlands, and floodplains. No designated parks, wilderness areas, wild and scenic rivers, or prime farmlands are present on the Campus. No populations of threatened or endangered species or their habitats have been identified on the Campus. The Campus includes historic and culturally important features (such as architecturally or historically significant buildings and structures and historically significant trees) that would be removed in order to construct new buildings on the Campus.

Proposed measures to protect such resources or to avoid or reduce impacts are:

The Proposed Master Plan improvements will be designed and constructed in a manner that preserves and maintains environmentally sensitive areas to the maximum extent practicable while achieving the goals of this essential public facility in providing healthcare services to the residents of western Washington.

Each of the individual projects will conduct site-specific studies to identify the presence of populations of threatened or endangered species or their habitats. Proven concepts and designs would incorporate measures to avoid or minimize any potential impacts to these important resources. Similarly, the projects will incorporate measures to sensitively address architecturally or historically significant buildings and structures on Campus.

5. *How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?*

   The proposed Master Plan improvements are wholly consistent with the current land use designation and zoning for the campus, and do not allow or encourage incompatible land or shoreline uses.

   Proposed measures to avoid or reduce shoreline and land use impacts are:

   The Master Plan based on a more compact facility design. This compact footprint allows for more efficient use of space, increased the efficiency utility services by reducing length of utility lines, and provides increased security for employees, staff, and neighbors by consolidating the facilities and incorporating interior fencing.

6. *How would the proposal be likely to increase demands on transportation or public services and utilities?*

   Proposed measures to reduce or respond to such demand(s) are:

   - As noted elsewhere, traffic impacts are projected to decrease over the course of the master plan's implementation.
   - New facilities will be developed to current standards for energy and water efficiency.

7. *Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.*

   The Master Plan will be consistent local, state, or federal laws or requirements for the protection of the environment including compliance with the planning processes for Pierce County and the City of Lakewood regarding the siting essential public facilities. This compliance will include consistency with the City's Comprehensive Plan, Master Plan, Zoning, and SEPA processes, including any public involvement components of these processes.

   Individual Master Plan projects will use a similar approach, conducting any site-specific studies necessary, and revising concepts and plans to comply with all applicable permitting and regulatory requirements, including building, critical areas, SEPA (if applicable), and zoning requirements.