

LAKEFRONT IMPROVEMENTS PHASE 2 TRAFFIC IMPACT ANALYSIS

Lake Forest Park, WA

September 2024

Prepared for:
City of Lake Forest Park

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INTRODUCTION

This Traffic Impact Analysis documents the traffic impacts associated with development of the Lakefront Improvements park (Project) in the City of Lake Forest Park. The purpose of this report is to identify traffic impacts resulting from the Project and, where appropriate, outline programmatic and/or physical improvements to minimize or eliminate those impacts.

Project Location

The Project is at 17345 and 17347 Beach Drive, on the east side of Beach Dr. NE. The Project site is comprised of King County land parcel numbers 403010050 (1.39 acres), 4030100040 (1.10 acres) and 4030100035 (0.81 acres). A vicinity map is included as **Figure 1**.

The middle parcel and northern parcel for the existing site includes 9 cabin structures that have been vacant and not occupied within the last 5 to 10 years. The southern parcel is identified as the City's Lyon Creek Waterfront Preserve.

The site is zoned RS-7 single family residential. Single family homes are present to the north of the Project site along Beach Drive. A conditional use permit has been approved for the park.

Project Description

The Project proposes to demolish two docks, 5 of the 9 existing cabins, remodel cabin 6 to a community flex space, remodel the cabin 7 garage to a bathroom facility, remodel cabin 8 to use as a community flex space, and remodel cabin 9 into a picnic shelter. New features will include a community space, play area, beach area, dock, parking facilities, and pathways. A site plan is included as **Figure 2**.

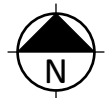
Build-out is anticipated by 2027.

Study Area

City of Lake Forest Park staff requested the following study area intersections for this analysis:

1. Bothell Way NE (SR 522) & NE 170th Street
2. Bothell Way NE (SR 522) & Middle Driveway
3. Bothell Way NE (SR 522) & Ballinger Way NE (SR 104)
4. Ballinger Way NE (SR 104) & NE 175th Street
5. Beach Drive NE & Ballinger Way NE
6. Beach Drive NE & Site Access

Traffic operations were evaluated for the PM peak hour and Saturday peak hour conditions. The PM peak hour is defined as the highest 4 consecutive 15-minute traffic volume intervals between 4-6 PM. The Saturday peak hour was determined based on guidance from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition (September 2021) for Public Parks which indicated that the highest trip generating hours for Saturday is from 11 AM to 1 PM.



APPROXIMATE SCALE FEET
100 0 100 200

Figure 1: Vicinity Map

Lake Forest Park-Park Improvements
Traffic Impact Analysis





Figure 2: Site Plan

EXISTING CONDITIONS

This section describes the existing transportation network in the study area.

Primary Roadways

The primary roadways in the study area are described below:

- Bothell Way NE (SR 522) is classified as a Principal Arterial. The road is 6-to-7-lanes wide and has a 35-mph posted speed. Curb, gutter, and sidewalk is present on the west side of Bothell Way NE in the project vicinity. The intersection at Beach Dr and Ballinger Way is signalized.
- Ballinger Way NE (SR 104) is classified as a Principal Arterial. Ballinger Way is 3 lanes wide and has a 30-mph posted speed. Curb and gutters are present on both sides of Ballinger Way NE, which includes traffic islands at the intersection with Bothell Way. Sidewalks are present on both sides of the street. The north sidewalk ends approximately 250 feet west of the intersection with Bothell Way.
- Beach Drive NE is classified as a Local Street. Beach Drive includes a 40-foot right of way. Curb is present on the east side of the street.

Road classifications are derived from the WSDOT Functional Classification Map.

Public Transportation Services

King County Metro provides service near the site.

- Route 331 Shoreline Community College to Kenmore, provides daily service with a westbound stop on Ballinger Way & NE 175th Street at Town Center and with an eastbound stop on Ballinger Way immediately north of Bothell Way.
- Route 322, Kenmore to First Hill, provides weekday AM peak hour service from Kenmore to First Hill in Seattle and PM peak hour service from First Hill to Kenmore with a stop on Bothell Way & Ballinger Way.
- Route 372, Bothell to University District, provides daily service between Bothell and the University District with a stop on Bothell Way & Ballinger Way.

Sound Transit provides service near the site.

- Route 522 Roosevelt to Woodinville provides daily service with a stop at Bothell Way & Ballinger Way.

Traffic Volumes

PM peak hour and Saturday peak hour intersection turning movement volumes were collected by TC2 at the study area intersections on Tuesday, August 6, 2024, from 4 to 6 PM and on Saturday, August 10, 2024, from 11 AM to 1 PM. Copies of the volumes are included in the **Appendix**.

Figure 3 illustrates the PM and weekend peak hour study intersections turning movement volumes.

PM (Weekend) Volume

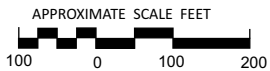
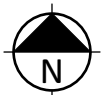
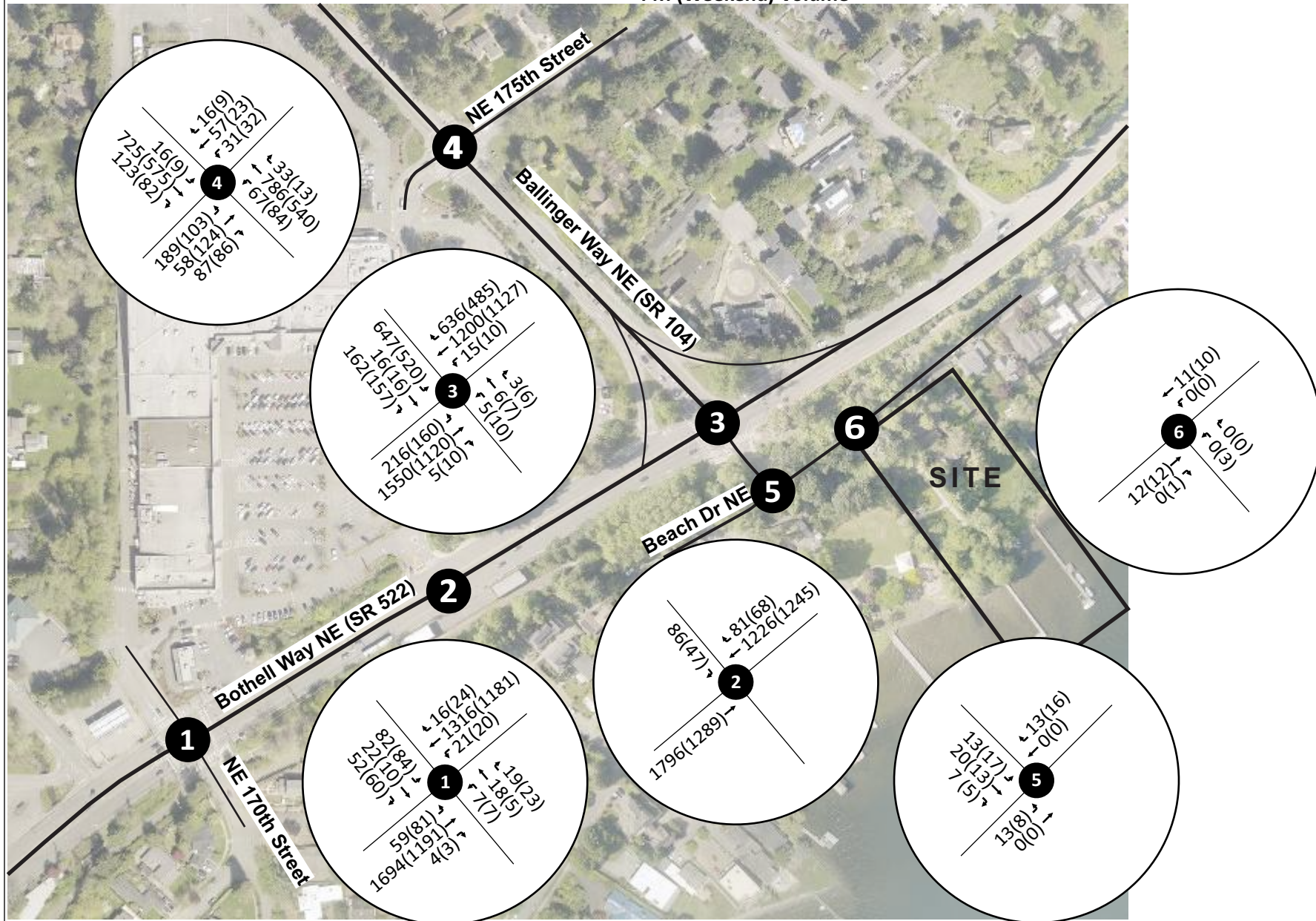


Figure 3: 2024 Existing Peak Hour Volumes

Lake Forest Park-Park Improvements
Traffic Impact Analysis

Intersection Analysis

Study intersections were evaluated using Synchro, version 11, a computer program to analyze signalized and stop-sign controlled intersections, including two-way stop-sign controlled (TWSC) intersections, based on the Highway Capacity Manual (HCM) 6 methodology.

Table 1 summarizes the study intersections' PM peak hour and Saturday peak hour intersection level of service (LOS). Copies of the operations output reports are included in the **Appendix**.

Table 1: 2024 Existing Intersection Level of Service and Delay

Intersection	Control Type	PM Peak ¹	Saturday Peak ¹
1. Bothell Way / NE 170th St	Signal	B (19.6)	B (19.6)
2. Bothell Way / Middle Driveway	EB Stop	C (16.1)	B (14.8)
3. Bothell Way / Ballinger Way	Signal	D (35.4)	D (36.5)
4. Ballinger Way / NE 175th St	Signal	B (19.0)	A (9.4)
5. Beach Dr / Ballinger Way	NB/SB Stop ²	A (9.6)	A (9.5)
6. Beach Dr / Site Access	WB Stop	A (0.0)	A (8.6)

¹ LOS (seconds of delay)

² Intersection analyzed as TWSC with NB/SB Stop. Intersection is uncontrolled.

The City of Lake Forest Park maintains LOS C/D for local roadways and WSDOT standard is LOS D for Bothell Way NE (SR 522) and LOS E Mitigated for Ballinger Way (SR 104). The study intersections satisfy the LOS standards.

Safety Analysis

Crash records were obtained from WSDOT for all study intersections for the most recent five-year period from 2019 through 2023. Intersection crash rates were calculated for each intersection based on crash history and traffic counts.

Intersection crash rates are typically expressed in terms of crashes per Million Entering Vehicles (MEV) and are calculated using the following equation:

$$R = \frac{C * 100,000,000}{365 * N * V}$$

where:

R = Crash rate, expressed as crashes per MEV, V = Average daily traffic (ADT) volume,

C = Total number of crashes in the study period, N = Number of years of crash data,

Generally, crash rates exceeding 1.00 per MEV indicate a potential high-crash location and may warrant a more detailed analysis to determine whether mitigation should be considered. Crash rates for the study intersections are summarized in **Table 2**. No crashes were reported at Beach Dr & Ballinger Way. No fatality or serious injury crashes were reported.

Table 2. 2019-2023 Intersection Crash History

Intersection	Predom- inant Crash Type	Crash Frequency (crashes/year)						Total Crashes	Crash Rate (/MEV)
		Fatal Injury (K)	Serious Injury (A)	Minor Injury (B)	Possible Injury (C)	PDO* (O)	All		
1. Bothell Way (SR 522) & NE 170th St	Rear-End (68%)	0.0	0.0	0.6	2.0	2.4	5.0	25	0.36
2. Bothell Way (SR 522) & Middle Driveway	Entering (100%)	0.0	0.0	0.2	0.2	1.2	1.6	8	0.04
3. Bothell Way (SR 522) & Ballinger Way (SR 104)	Rear-End (76%)	0.0	0.0	0.6	2.0	6.4	9.0	45	0.49
4. Ballinger Way (SR 104) & NE 175th St	Rear-End (50%)	0.0	0.0	0.2	0.4	1.4	2.0	10	0.25
6. Beach Dr & Site Entrance	None	0.0	0.0	0.0	0.0	0.2	0.2	1	2.26

* Property Damage Only (PDO)

One suspected minor injury pedestrian crash occurred at the intersection of Bothell Way & NE 170th Street on November 13, 2021, at 5:05 PM. The weather conditions were noted as raining and wet with streetlights on. The vehicle was turning left from southbound NE 170th Street to eastbound Bothell Way. The driver contributing circumstance was “did not grant right of way to non-motorist.”

The intersection of Beach Drive and the site entrance included one non-injury crash with a parked vehicle on October 12th, 2019. The Crash Rate per MEV is greater than 1.00 due to the low volume of the roadway.

A sidewalk is proposed on the west side of Beach Drive to Ballinger Way including a new sidewalk and crosswalk on the south side of Ballinger Way to connect to the intersection of Bothell Way and Ballinger Way where non-motorized users can cross Bothell Way via the existing pedestrian route to City Hall (located at the southwest corner of Ballinger Way [SR 104] and Bothell Way [SR 522]). The sidewalk will also connect the park with the Burke Gillman Trail, a regional facility.

FUTURE CONDITIONS WITHOUT THE PROJECT

The project is anticipated to be built-out and operational by 2027. The horizon analysis year for this study is 2027, to represent a mature project. This section describes the future traffic without the project.

Local Improvements

WSDOT’s Surface Transportation Improvement Plan (STIP) was evaluated, and no improvements were identified within the project vicinity.

Public Transportation Services

Sound Transit 3 authorized funding for a bus rapid transit route between the NE 145th Link light rail station and the SR 522 and I-405 interchange at S3. The route will pass through Lake Forest Park on Bothell Way NE. The project is expected to be in service by 2027.

Traffic Volumes

Non-project traffic growth includes growth generated by new development through the study area and general traffic growth through the study area.

For this analysis, a 0.5% annual growth rate was applied to the existing traffic volumes to forecast general traffic growth through the study area and account for growth generated by small new pipeline development, consistent with the Safe Highways Report from March 2018.

Figure 4 illustrates the 2027 AM and PM peak hour volumes without the project.

Intersection Analysis

Table 3 summarizes the study intersection PM and Saturday peak hour study intersection LOS. Copies of the operations output reports are included in the **Appendix**.

Table 3: 2027 Intersection Level of Service and Delay without the Project

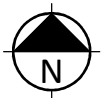
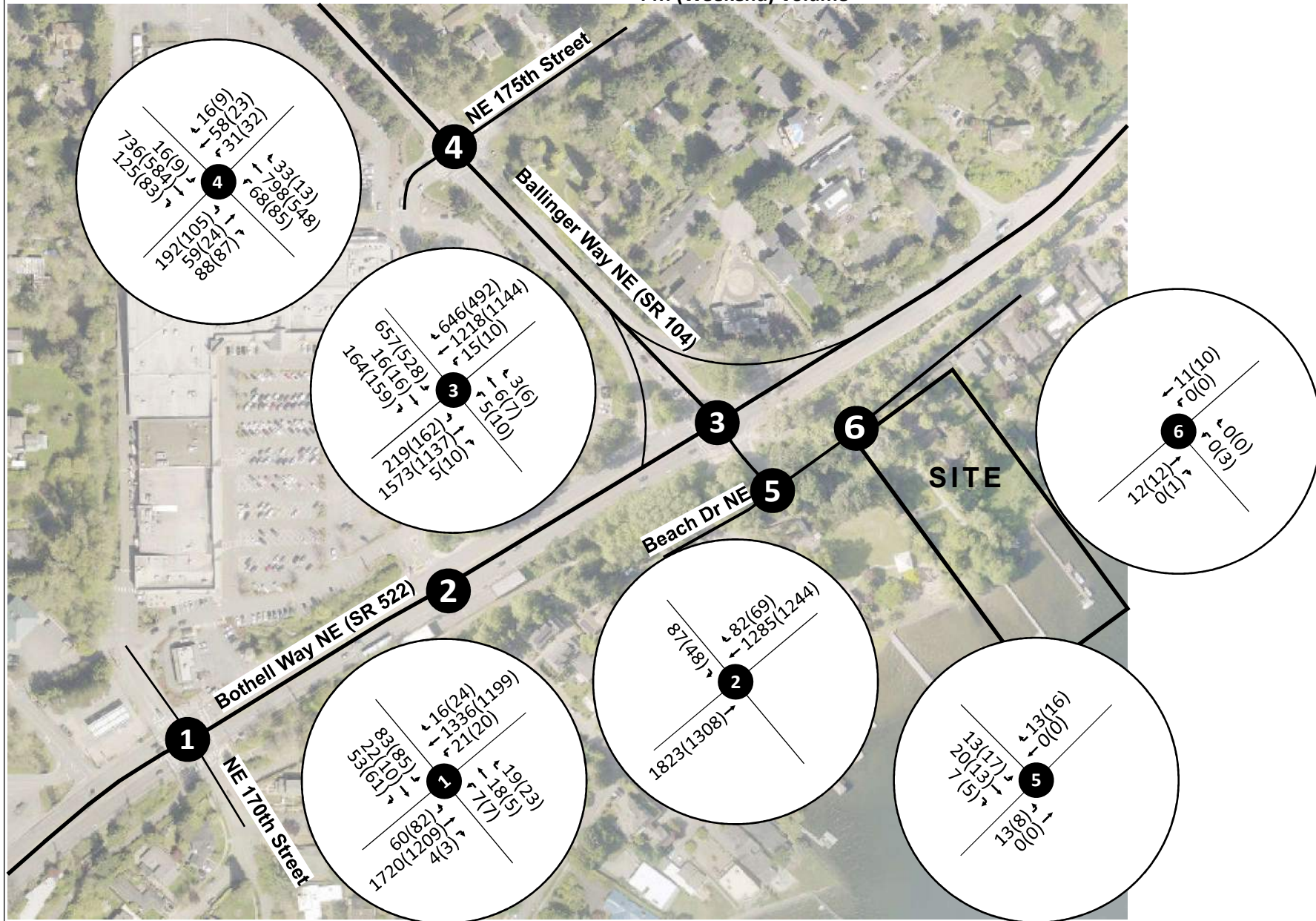
Intersection	Control	2024 Existing		2027 without the Project	
		PM Peak ¹	Sat Peak ¹	PM Peak ¹	Sat Peak ¹
1. Bothell Way / NE 170th St	Signal	B (19.6)	B (19.6)	B (19.9)	C (20.1)
2. Bothell Way / Middle Dwy	EB Stop	C (16.1)	B (14.8)	C (16.3)	C (15.0)
3. Bothell Way / Ballinger Way	Signal	D (35.4)	D (36.5)	D (36.0)	D (37.1)
4. Ballinger Way / NE 175th St	Signal	B (19.0)	A (9.4)	C (20.1)	A (9.6)
5. Beach Dr / Ballinger Way	NB/SB Stop ²	A (9.6)	A (9.5)	A (9.6)	A (9.5)
6. Beach Dr / Park Access	WB Stop	A (0.0)	A (8.6)	A (0.0)	A (8.6)

¹ LOS (second of delay)

² Intersection analyzed as TWSC with EB/WB Stop. Intersection is uncontrolled.

All intersections operate at or above WSDOT and City of Lake Forest Park LOS standards.

PM (Weekend) Volume



APPROXIMATE SCALE FEET
100 0 100 200

Figure 4: 2027 Without Project Volumes

Lake Forest Park-Park Improvements
Traffic Impact Analysis



PROJECT IMPACTS

This section summarizes the project's trip generation, trip distribution and travel assignment forecasts.

Proposed Trip Generation

Data from the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition* (September 2021), Land Use 411, Public Park, was used to forecast trip generation for the proposed project. **Table 4** summarizes the trip generation for the Park.

Table 4: ITE Park Trip Generation

Time-Period	Size (acres)	Trip Rate	% In	% Out	In	Out	Total
Weekday Daily	3.3	0.78 trips/ acre	50	50	2	1	3
PM Peak Hour Trips	3.3	0.11 trips/acre	59	41	0	0	0
Weekend Peak	3.3	0.31 trips/acre	39	61	0	1	1

The ITE Trip Generation Manual data includes parks that are an average size of 612 acres. The proposed park is 3.3 acres. The average trip rate from the ITE Manual is expected to underestimate the forecasted number of trips for the proposed park due to the 200 to 1 difference in park size.

Since the ITE Manual did not offer a representative land use code for this Project, trip generation rates for the proposed park use were taken from a more suitable Trip and Parking Generation Study completed in March of 2023 by ITE Cal Poly for Santa Rose Park in San Luis Obispo for the Western District ITE Data Collection Project. The park size in that study is 9.98 acres and includes various amenities including “grass fields, picnic areas, playground facilities, basketball courts, softball fields, a skate park, and a roller sport field.” That park is also located near a major state highway.

The Lakefront Improvements include a large, renovated house structure with bathrooms and a deck, a shelter, a play area, a swimming area, and a public launch dock for kayaks. The Lakefront Improvements is located near a major state highway. The trip generation forecast for the Lakefront Park using the trip generation rates for the Santa Rosa Park are summarized in **Table 5**.

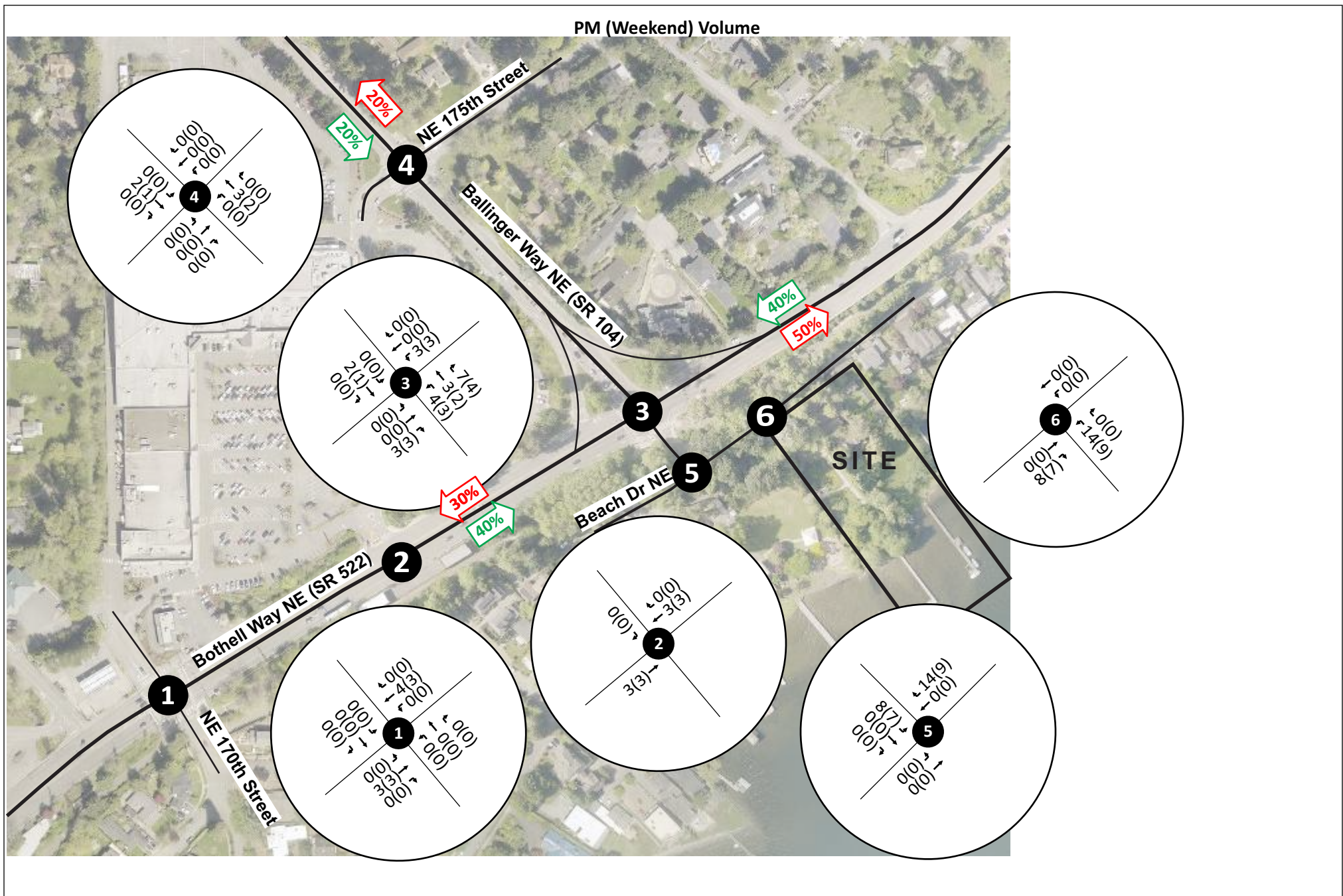
Table 5: Santa Rosa Park Trip Generation

Time-Period	Size (acres)	Trip Rate	% In	% Out	In	Out	Total
PM Peak Hour Trips	3.3	6.71 trips/acre	37	63	8	14	22
Weekend Peak	3.3	5.01 trips/acre	44	56	7	9	16

The trip generation study is included in the **Appendix**.

Trip Distribution and Travel Assignment

A trip distribution and peak hour travel assignment forecast are included as **Figure 5**.



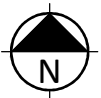
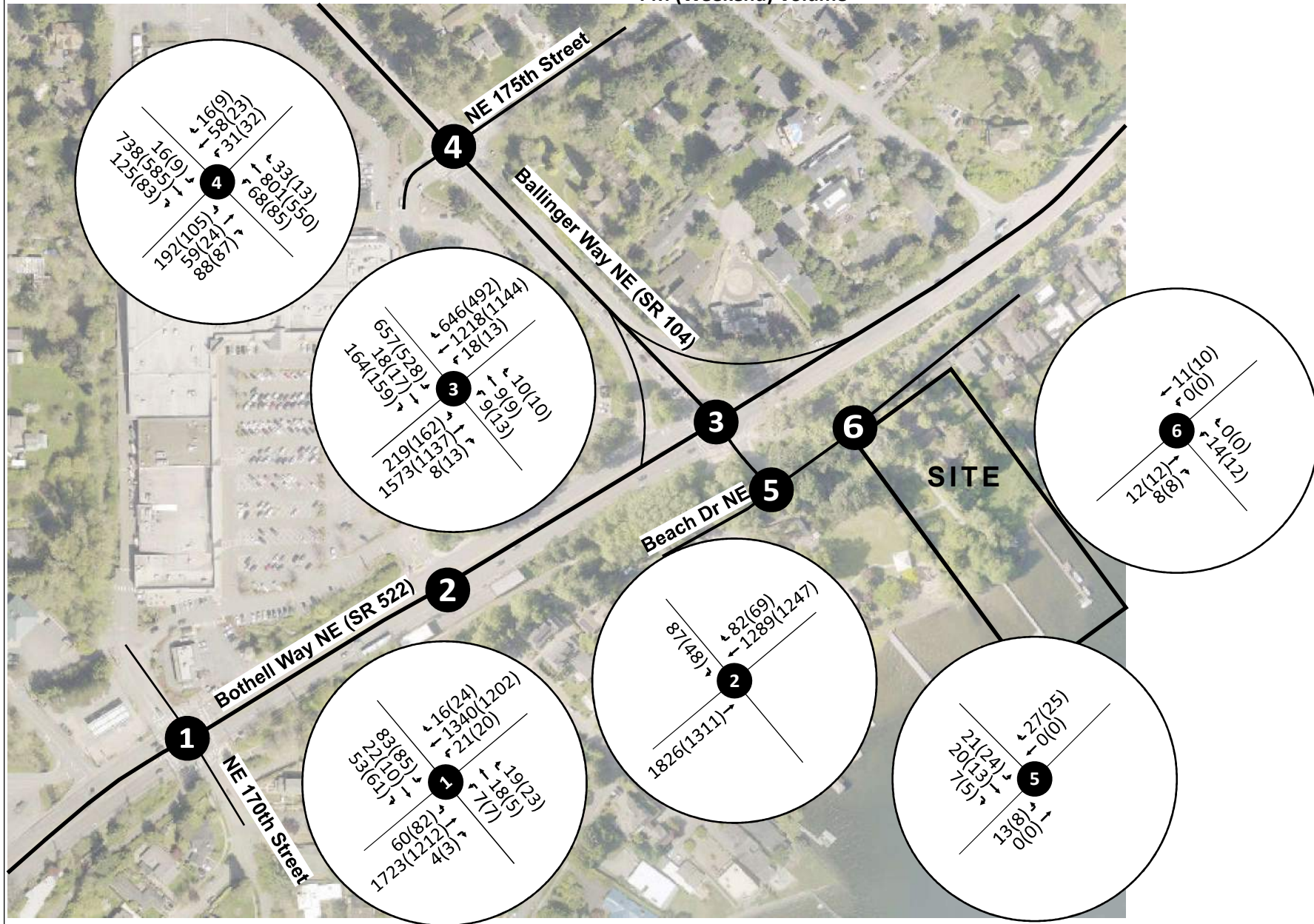
APPROXIMATE SCALE FEET
100 0 100 200

Figure 5: Project Trips & Trip Distribution

Lake Forest Park-Park Improvements
Traffic Impact Analysis



PM (Weekend) Volume



APPROXIMATE SCALE FEET
100 0 100 200

Figure 6: 2027 With Project Volumes

Lake Forest Park-Park Improvements
Traffic Impact Analysis

FUTURE CONDITIONS WITH THE PROJECT

This section describes the 2027 traffic with the project.

Public Transportation Services

The project is not anticipated to alter existing public transportation services.

Traffic Volumes

Future traffic volumes with the Project were computed by adding the Project trips to the future traffic volume conditions without the Project.

Figure 6 illustrates the 2027 PM peak hour and Saturday peak hour volumes with the Project.

Intersection Analysis

Table 6 summarizes the study intersection PM and Saturday peak hour study intersection LOS. Copies of the operations output reports are included in the **Appendix**.

Table 6: 2027 Intersection Level of Service and Delay with Project

Intersection	Control Type	2027 without the Project		2027 with the Project	
		PM Peak ¹	Sat Peak ¹	PM Peak ¹	Sat Peak ¹
1. Bothell Way / NE 170th St	Signal	B (19.9)	C (20.1)	B (20.0)	C (20.1)
2. Bothell Way/ Middle Dwy	EB Stop	C (16.3)	C (15.0)	C (16.4)	C (15.1)
3. Bothell Way / Ballinger Way	Signal	D (36.0)	D (37.1)	D (37.5)	D (41.9)
4. Ballinger Way / NE 175th St	Signal	C (20.1)	A (9.6)	C (20.2)	A (9.6)
5. Beach Dr / Ballinger Way	NB/SB Stop ²	A (9.6)	A (9.5)	B (10.0)	A (9.8)
6. Beach Dr / Site Access	WB Stop	A (0.0)	A (8.6)	A (9.0)	A (8.7)

¹ LOS (second of delay)

² Intersection analyzed as TWSC with EB/WB Stop. Intersection is uncontrolled.

All intersections operate at or above WSDOT and City LOS standards. Traffic mitigation is not required.

PARKING ANALYSIS

The Project is comprised of three parcels totaling 3.3 acres. The southern parcel is a 1.39-acre passive use, existing City park known as Lyon Creek Waterfront Preserve. Information from the City's website:

In 1998, the City of Lake Forest Park bought the residential property at the mouth of Lyon Creek, with the help of state and local grants, to develop as a park. In 2015, construction from the Lyon Creek Flood Mitigation Project has reestablished the floodplain by clearing and grading Lyon Creek Waterfront Preserve, constructing a floodplain with berm to contain flood water to the limits of the property. The property has been re-landscaped in the disturbed areas with ~4,000 native plants.

One (1) Americans with Disabilities Act (ADA)-compliant parking space is currently provided at the existing entrance to the Lyon Creek Waterfront Preserve park and two (2) signed/designated general use parking spaces are provided off-site for it at the City Hall parking lot. The existing park has a viewing dock and scenic and nature viewings from park benches.

As parking facilities have been established and provided for the Lyon Creek Waterfront Preserve park since 2015, the following assessment of parking needs for the Project is based upon the planned amenities and uses on the 1.9 acres of the two waterfront parcels adjacent to and north of the existing park area.

Lake Forest Park Municipal Code

The Lake Forest Park Municipal Code (LFPMC) Chapter 18.58, Table 18.58.030 Off-Street Parking Requirements by Land Use, outlines the parking requirements. The parking required for the project per Item 13, Recreational Facilities is "one parking space per employee and one parking stall for each 40 square feet of total floor area used for assembly purposes."

The renovated "Big House" that is a planned as community flex space is a total of 1,525 square feet of which 1,131 square feet will be for assembly purposes. The proposed picnic shelter area is 582 square feet. The combination of these two areas equal 1,713 square feet of total floor area to be used for assembly purposes. It is assumed there will be one employee for the park that needs parking. Based upon LFPMC and the proposed design, a total of 44 parking spaces would be required. The site plans identify 10 parking spaces will be provided on-site. The Project indicates that the balance of parking needed, that cannot be provided on-site, will be provided off-site at the City Hall parking lot by way of a shared use parking agreement. This shared use parking arrangement would be similar to how 2 parking spaces are currently provided for the existing Lyon Creek Waterfront Preserve.

The 44 parking spaces identified as being needed per the LFPMC translates into a total provided parking rate of 23.16 stalls/acre (44 stalls for 1.9 acres).

Parking Codes of Nearby Local Agencies

Parking requirements were evaluated for the cities of Sammamish and Kenmore as they have relevant similarities to Lake Forest Park. Kenmore Municipal Code 18.40.030 states that the City Manager sets the required minimum parking spaces for parks. For the City of Sammamish, the Community Development Director sets the minimum parking spaces required for parks.

ITE Parking Generation for Parks

The *ITE Parking Generation Manual, 6th Edition* (October 2023) includes Land Use Code 411 Public Park that has a variable input of acres. The average size of park used for the study that resulted in the parking rates was 126 acres for weekday peak parking demand and 20 acres for peak Sunday demand. The parks surveyed in the ITE study varied widely as to location, type, and number of facilities. The setting/location for this code is identified as “general urban/suburban.” The 85th percentile parking rate was used in this document to evaluate the parking demand for the weekday and Sunday/weekend peak demand periods.

The Santa Rosa Park Trip Generation and Parking ITE Study (March 2023) included a peak parking rate for a weekday and Saturday/weekend. Santa Rosa Park in San Luis Obispo, California is an active 10-acre park site that contains several amenities including large grass fields, picnic areas, playground facilities, basketball courts, softball fields, a skate park, and a roller sport field.

Table 7 includes an evaluation and comparison of the parking demand for the Project using both above referenced ITE sources.

Table 7: Parking Demand Evaluation

Source	Time Period	Parking Rate	Quantity	Parking Demand
ITE Parking Generation Manual	Weekday	5.52/acre	1.9 acres	11
	Weekend	7.21/acre	1.9 acres	14
Santa Rosa Park ITE Study	Weekday	5.21/acre	1.9 acres	10
	Weekend	4.01/acre	1.9 acres	8

The ITE Parking Generation Manual indicates that the 85th percentile parking demand for the weekend is 14 spaces, which is lower than the number of parking spaces required by LFPMC. In accordance with this ITE source, the 10 spaces identified for on-site parking would not meet the demand and additional parking would be required off-site.

The Santa Rosa Park ITE Study indicates that using its parking rates of demand, 10 parking spaces would be required for the weekend, which is less than ITE’s Parking Generation Manual and equal to the 10 spaces identified for on-site parking for the Project.

Accessible Parking

The Project is required to provide ADA-compliant parking spaces in accordance with the accessibility standards that apply to places of public accommodation, commercial facilities, and state and local government facilities in new construction, alterations, and additions. The ADA Standards are based on minimum guidelines set by the U.S. Access Board. The minimum number of parking stalls that are required to be accessible is a subset of the total number of parking stalls required for a site. **Table 8** includes information excerpted from Chapter 5: Parking Spaces from the U.S. Access Board website.

Table 8: Minimum Number of Accessible Parking Spaces

Parking Facility Total	Minimum Number of Accessible Spaces		
	Standard	Van*	Total (Standard + Van)
1 to 25	0	1	1
26 to 50	1	1	2
51 to 75	2	1	3
76 to 100	3	1	4

* at least 1 of every 6 accessible spaces or fraction of 6

If the LFPMC is the basis to determine the total number of stalls for the Project (44), then a minimum of 2 ADA stalls are required. If ITE sources are used as the basis determine the total number of stalls for the Project (14), then a minimum of 1 ADA stall is required.

It should be noted that 1 ADA-compliant stall is currently provided at the existing entrance to the Lyon Creek Waterfront Preserve park and 2 general use parking spaces for the existing park are designated and currently provided off-site at the City Hall parking lot. Since few changes are being made to the Lyon Creek Waterfront Preserve area, it is expected that the same number of existing ADA and general use parking spaces will be added to the number of parking spaces identified as needed for the new park area.

Nearby Local Agency Park Parking

A parking provision rate was calculated from waterfront parks in the City of Bellevue that have similar uses and access to Lake Washington as the Project. **Table 9** shows their park acreage, the number of general use parking spaces provided, the number of ADA designated stalls provided, total number of parking stalls, and a calculated rate of total parking spaces provided per acre.

Table 9: City of Bellevue Waterfront Parks Parking Provision Rates

Park	Park Size (Acres)	General Use Parking Stalls Provided	ADA Stalls Provided	Total Stalls Provided	Total Parking Provided Rate (Stalls/Acre)
Burrows Landing	0.15	2	0	2	13.42
Chesterfield Beach Park	0.60	5	0	5	8.38
Clyde Beach Park	2.06	18	3	21	10.19
Enatai Beach Park	4.12	32	2	34	8.25
Meydenbauer Bay Park	8.60	50	2	52	6.02
Chism Beach Park	17.03	68	5	73	4.29
Newcastle Beach Park	42.48	155	6	161	3.79
Average	10.72			Average	7.77
Median	4.12			Median	8.25

The average parking stalls provided rate for the City of Bellevue waterfront parks is 7.77 spaces per acre. This rate is slightly above the ITE Parking Generation Manual 85th percentile demand rate of 7.21 spaces per acre for weekends.

A parking stall comparison was also made to Log Boom Park, a nearby and similar waterfront park located in the City of Kenmore with access to Lake Washington. Log Boom Park is 3.9-acres with 50 general use parking stalls and 2 ADA stalls. The total parking provided rate for Log Boom Park is 13.33 stalls per acre.

Parking Recommendations

This document identifies different parking rates associated with parks and recreational facilities from different sources. The Project site and its anticipated park amenities have unique attributes which do not translate exactly to any referenced parking rate. This is expected considering that parks have many different settings, types, uses, and sizes, therefore an exercise in judgement is appropriate to determine the number of parking stalls to include with a new park facility.

Given that Project site park is identified as a passive use facility, one may assert that its amenities ought not be categorized as the type of recreational facility that is listed in the LFPMC. Similarly, each of the other nearby city waterfront parks may have enough subtle differences in their uses and users to allow one to challenge that their rates are not exactly the same as may be expected at Project site. Even with these minor differences, the example parking rates provided in this document offer reasonable references that ought to be considered when determining the parking needs for the Project. **Table 10** provides a comparison of the different parking rates identified from various sources included within this document.

Table 10: Comparison of Parking Rates

Source	Park Size (Acres)	Time Period	Parking Provided Rate (Stalls/Acre)	Project Site (Acres)	Parking Provided Calculation
Santa Rosa Park ITE Study	9.98	Weekday	5.21	1.9	10
ITE Parking Generation Manual	20 (avg)	Weekend	7.21	1.9	14
City of Bellevue Waterfront Parks	10.72 (avg) 4.12 (median)	---	7.77	1.9	15
City of Kenmore Log Boom Park	3.90	---	13.33	1.9	26
LFPMP Recreational Facilities (Item 13)	---	---	23.16	1.9	44

Another consideration when determining the amount of parking for a park site is its ability to be accessed by way of multiple modes of travel. The location of the Project site offers a relevant attribute to a determination about parking needs given that it is located close to the Burke Gillman trail and to transit stops along Bothell Way. Due to the park's location near a regional shared-use trail and to transit stops, park users may arrive at the Project site by walking, rolling, biking, or via transit, which could understandably reduce the total need for parking in comparison to a park that was not located along a regional trail.

The parking number calculated using the LFPMP category for Recreational Facilities is approximately 3 times the parking rate identified as needed by the ITE Parking Generation Manual and is approximately 3 times the parking rate provided for similar waterfront parks in the City of Bellevue. Therefore, it is reasoned that the LFPMP does not correlate as the relevant methodology to follow when determining the parking spaces needed for the Project.

Kenmore's Log Boom Park provides a useful and nearby comparison to the Project, however its parking provided is nearly 2 times the parking rate identified as needed by the ITE Parking Generation Manual and is nearly 2 times the parking rate provided for similar waterfront parks in the City of Bellevue. Therefore, it is logical that using this parking rate would result in more parking than is needed to fulfil the needs of the Project.

Bellevue's seven (7) waterfront parks provide a variety of relevant examples upon which to draw comparisons for the Project. ITE sources also provide relevant parking rates for the Project, which can be supported as they are considered national industry standards.

Based upon the resources and examples provided in this document, it is recommended that a parking rate of 10 stalls per acre be provided for the 1.9 acres of new park. This results in 19 parking spaces for the new park that are recommended to be combined with the 3 parking spaces provided for the existing park for a total of 22 parking spaces for the Project.

A 10 stalls per acre parking rate represents the approximate midpoint between the parking provided rate by City of Bellevue waterfront parks (7.77) and the City of Kenmore's Log Boom Park (13.33), all of which are along Lake Washington. It is also the approximate midpoint between ITE's Parking Generation Manual rate (7.21) and Log Boom Park's rate. The recommended 10 stalls per acre rate is greater than the parking provided rates for 5 of 7 waterfront parks in Bellevue. The 10 stalls per acre parking rate is also approximately the same parking provided rate (10.19) for Bellevue's Clyde Beach Park, a 2.06-acre park that is roughly the same size as the 1.91-acre park improvements for the Project.

The 22 total parking space recommendation for the Project also results in having approximately half (10) of the parking spaces provided on-site and the other approximate half (12) of the parking spaces provided off-site at City Hall by way of a shared used parking agreement. The existing off-site parking agreement at City Hall that provides two (2) parking spaces for Lyon Creek Waterfront Preserve would need to be amended to designate and allocate an additional ten (10) parking spaces to meet the needs of the Project.

The 22 total parking spaces for the Project includes parking spaces that are ADA-compliant. A minimum of 2 ADA parking spaces are recommended on-site, which is comprised of 1 standard ADA space and 1 van accessible space. The total number of ADA parking spaces may be increased as determined by the City.

It will be the City's determination as to whether a variance will be required of the Project from the LFPMC parking calculation for recreational facilities. This determination is anticipated to be based upon whether this definition of recreational facilities is applicable to the Project. The comparison to the number of spaces calculated for similar nearby local park facilities and parking rates provided by national industry standards is likely to be considered when determining the need for a variance. If a variance is required by the City, the comparative references included in this document are expected to be cited as reason for its approval request.

TRAFFIC MITIGATION

All intersections operate at or above City and WSDOT level of service standards, therefore no traffic mitigation is recommended.

APPENDIX

- Traffic Volumes
- ITE Trip Generation Manual-Public Park Sheets
- ITE Parking Generation Manual-Public Park Sheets
- ITE Western District Trip Generation and Parking Study
- 2024 Existing Peak Hour Intersection Level of Service
- 2027 Peak Hour Intersection Level of Service without the Project
- 2027 Peak Hour Intersection Level of Service with the Project

Traffic Volumes

Intersection 1-Tuesday



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: West Driveway/NE 170th St & Bothell Way NE

Date of Count: Tue 08/06/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB) West Driveway				From South on (NB) NE 170th St				From East on (WB) Bothell Way NE				From West on (EB) Bothell Way NE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	16	7	19	0	0	6	2	5	5	269	3	4	28	414	0	769
4:30 P	0	22	3	8	0	3	2	3	2	7	322	6	3	8	442	0	826
4:45 P	0	23	7	17	0	2	2	2	4	10	278	1	2	15	401	0	758
5:00 P	0	15	8	14	0	2	5	7	2	5	350	7	5	17	426	0	856
5:15 P	0	24	4	20	0	3	2	2	12	5	317	4	5	17	438	2	838
5:30 P	0	19	6	9	1	1	5	7	5	7	322	2	3	13	442	1	834
5:45 P	0	24	4	9	0	1	6	3	2	4	327	2	5	12	388	1	781
6:00 P	0	13	4	17	0	0	1	3	3	12	335	2	3	19	437	1	844
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	156	43	113	1	12	29	29	35	55	2520	27	30	129	3388	5	6506
--------------	---	-----	----	-----	---	----	----	----	----	----	------	----	----	-----	------	---	------

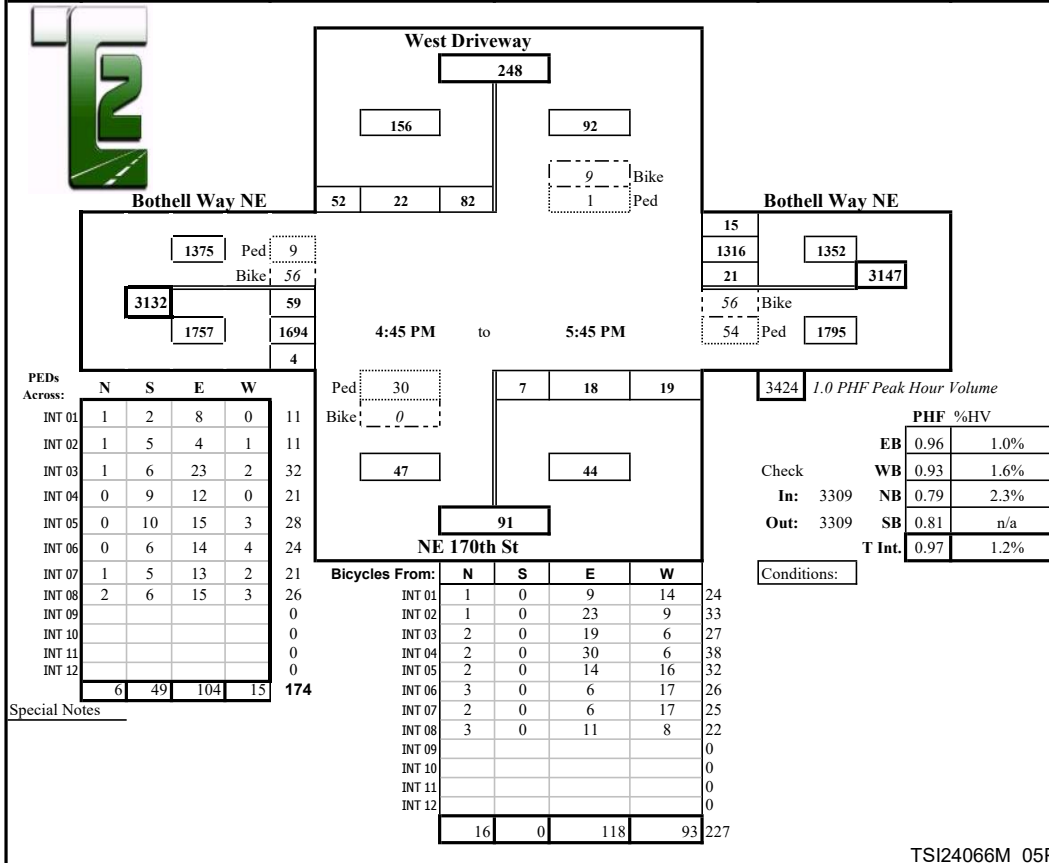
	Peak Hour: 4:45 PM to 5:45 PM																
--	-------------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Total	0	82	22	52	1	7	18	19	21	21	1316	15	18	59	1694	4	3309
-------	---	----	----	----	---	---	----	----	----	----	------	----	----	----	------	---	------

Approach	156				44				1352				1757				3309
----------	-----	--	--	--	----	--	--	--	------	--	--	--	------	--	--	--	------

%HV	n/a				2.3%				1.6%				1.0%				1.2%
-----	-----	--	--	--	------	--	--	--	------	--	--	--	------	--	--	--	------

PHF	0.81				0.79				0.93				0.96				0.97
-----	------	--	--	--	------	--	--	--	------	--	--	--	------	--	--	--	------



TSI24066M_05P

Intersection 2-Tuesday



Prepared for:

Transportation Solutions, Inc.

Traffic Count Consultants, Inc.

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

WBE/DBE

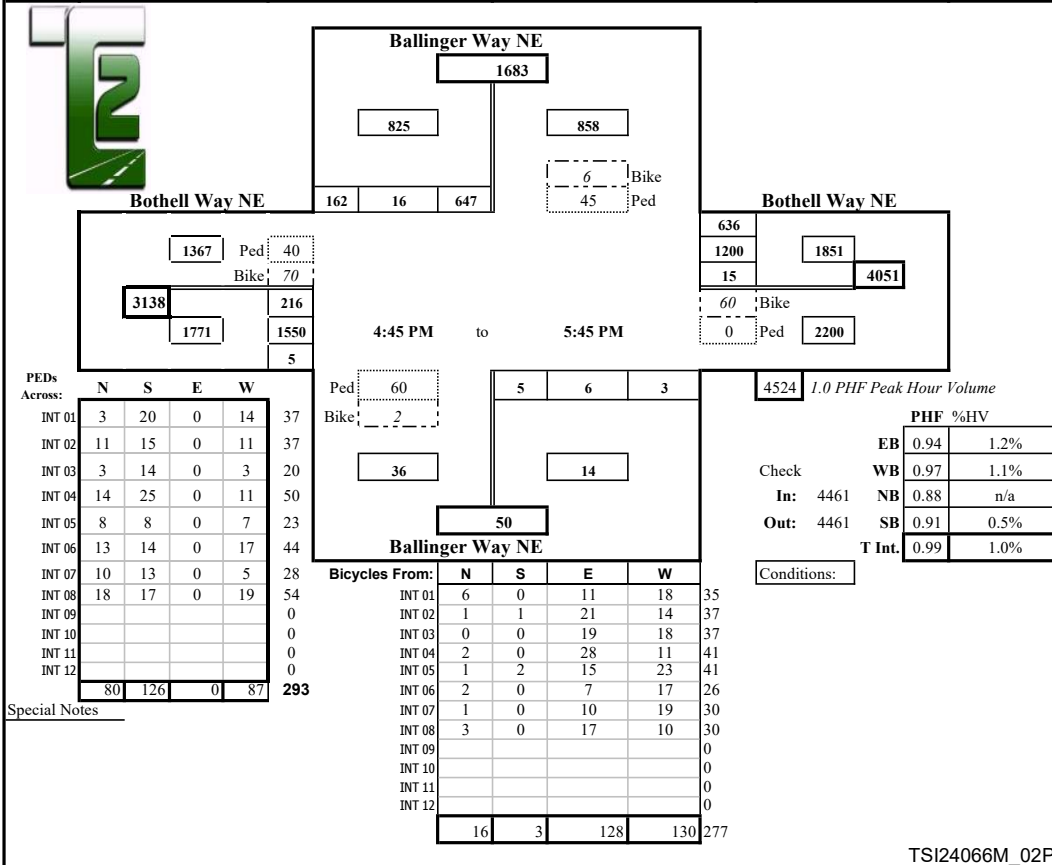
Intersection: Ballinger Way NE & Bothell Way NE

Date of Count: Tue 08/06/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB) Ballinger Way NE				From South on (NB) Ballinger Way NE				From East on (WB) Bothell Way NE				From West on (EB) Bothell Way NE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	135	4	30	0	3	1	2	8	2	255	169	3	71	385	0	1057
4:30 P	3	136	5	41	0	3	6	2	4	2	299	164	3	52	389	3	1102
4:45 P	2	172	5	38	0	2	1	3	3	5	255	156	3	72	368	1	1078
5:00 P	1	158	4	40	0	1	2	1	4	3	318	156	5	39	395	3	1120
5:15 P	1	150	2	47	0	1	2	0	5	6	299	164	5	56	395	1	1123
5:30 P	1	161	8	28	0	1	2	0	5	1	298	161	6	58	413	0	1131
5:45 P	1	178	2	47	0	2	0	2	6	5	285	155	5	63	347	1	1087
6:00 P	1	163	2	37	0	1	2	2	4	1	301	139	3	47	416	0	1111
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	11	1253	32	308	0	14	16	12	39	25	2310	1264	33	458	3108	9	8809
Peak Hour: 4:45 PM to 5:45 PM																	
Total	4	647	16	162	0	5	6	3	20	15	1200	636	21	216	1550	5	4461
Approach	825				14				1851				1771				4461
%HV	0.5%				n/a				1.1%				1.2%				1.0%
PHF	0.91				0.88				0.97				0.94				0.99



TSI24066M_02P

Intersection 3-Tuesday



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: Middle Driveway/Business Driveway & Bothell Way NE

Date of Count: Tue 08/06/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB) Middle Driveway				From South on (NB) Business Driveway				From East on (WB) Bothell Way NE				From West on (EB) Bothell Way NE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	7	0	0	0	0	5	0	267	21	4	0	456	0	751
4:30 P	0	0	0	29	0	0	0	1	2	0	314	29	2	0	443	1	817
4:45 P	0	0	0	17	0	0	0	1	2	0	271	24	1	0	440	0	753
5:00 P	0	0	0	20	0	0	0	1	2	0	339	20	3	0	436	0	816
5:15 P	0	0	0	24	0	0	0	0	4	0	324	23	4	0	452	0	823
5:30 P	0	0	0	22	0	0	0	1	4	0	304	23	4	0	470	0	820
5:45 P	0	0	0	17	0	0	0	0	2	0	322	12	4	0	411	0	762
6:00 P	0	0	0	17	0	0	0	0	3	0	316	23	2	0	463	0	819
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	153	0	0	0	4	24	0	2457	175	24	0	3571	1	6361

Peak Hour: 5:00 PM to 6:00 PM

Total	0	0	0	80	0	0	0	1	13	0	1266	81	14	0	1796	0	3224
Approach	80				1				1347				1796				3224
%HV	n/a				n/a				1.0%				0.8%				0.8%
PHF	0.83				0.25				0.97				0.96				0.98



Middle Driveway

161

80

81

80 0 0

0 2 Bike Ped

Bothell Way NE

1346 Ped 0

Bike 52

3142 0

1796 1796

0

Bothell Way NE

81

1266 1347

0 3144

34 Bike

0 Ped 1797

5:00 PM to 6:00 PM

Ped 47

Bike 0

0

1

Business Driveway

1

0 0 1

3292 1.0 PHF Peak Hour Volume

PEDs Across:

	N	S	E	W	
INT 01	0	5	0	0	5
INT 02	0	9	0	0	9
INT 03	0	13	0	0	13
INT 04	1	11	0	0	12
INT 05	0	14	0	0	14
INT 06	0	9	0	0	9
INT 07	1	12	0	0	13
INT 08	1	12	0	0	13
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	3	85	0	0	88

Bicycles From:

	N	S	E	W	
INT 01	0	0	9	14	23
INT 02	0	0	20	9	29
INT 03	0	0	20	13	33
INT 04	0	0	29	10	39
INT 05	0	0	15	16	31
INT 06	0	0	5	14	19
INT 07	0	0	6	14	20
INT 08	0	0	8	8	16
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	112	98	210

PHF %HV

	PHF	%HV
EB	0.96	0.8%
WB	0.97	1.0%
NB	0.25	n/a
SB	0.83	n/a
T Int.	0.98	0.8%

Check In: 3224 Out: 3224

Conditions:

Special Notes

TSI24066M_04P

Intersection 4-Tuesday



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: Ballinger Way NE & NE 175th St/North Driveway

Date of Count: Tue 08/06/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB) Ballinger Way NE				From South on (NB) Ballinger Way NE				From East on (WB) NE 175th St				From West on (EB) North Driveway				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	6	116	20	3	19	208	9	1	9	12	4	0	45	12	14	474
4:30 P	4	6	146	35	0	16	208	6	0	10	13	1	0	35	15	25	516
4:45 P	2	7	186	32	1	22	208	6	0	8	17	5	0	39	10	21	561
5:00 P	1	4	187	26	2	14	190	9	0	10	14	4	0	47	20	28	553
5:15 P	1	2	179	33	1	20	186	11	0	6	14	2	0	58	18	16	545
5:30 P	1	3	173	32	1	11	202	7	0	7	12	5	0	45	10	22	529
5:45 P	3	11	189	24	3	17	163	8	0	13	11	8	0	39	10	19	512
6:00 P	0	2	181	33	1	31	154	14	0	10	13	5	0	46	7	22	518
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	12	41	1357	235	12	150	1519	70	1	73	106	34	0	354	102	167	4208
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Peak Hour: 4:30 PM to 5:30 PM

Total	5	16	725	123	5	67	786	33	0	31	57	16	0	189	58	87	2188
-------	---	----	-----	-----	---	----	-----	----	---	----	----	----	---	-----	----	----	------

Approach	864				886				104				334				2188
%HV	0.6%				0.6%				n/a				n/a				0.5%
PHF	0.96				0.94				0.87				0.88				0.98



North Driveway

247	Ped	7
581	Bike	1
334		189
		58
		87

Ballinger Way NE

1855

864	991
123	725
16	

0 Bike
21 Ped

4:30 PM to 5:30 PM

1729

Ballinger Way NE

NE 175th St

16	104
57	211
31	
2	107
2	

2 Bike
2 Ped

PEDs Across:

	N	S	E	W	
INT 01	1	1	1	1	4
INT 02	1	0	0	0	1
INT 03	4	0	0	2	6
INT 04	5	1	1	1	8
INT 05	3	0	1	0	4
INT 06	9	2	0	4	15
INT 07	5	0	0	1	6
INT 08	1	3	3	0	7
INT 09					0
INT 10					0
INT 11					0
INT 12					0
Total	29	7	6	9	51

Bicycles From:

	N	S	E	W	
INT 01	2	0	0	2	4
INT 02	0	0	0	0	0
INT 03	0	0	0	0	0
INT 04	0	2	2	0	4
INT 05	0	1	0	1	2
INT 06	0	2	0	0	2
INT 07	3	1	0	0	4
INT 08	1	0	0	0	1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
Total	6	6	2	3	17

PHF %HV

	PHF	%HV
EB	0.88	n/a
WB	0.87	n/a
IN	2188	0.94
Out	2188	0.96
T Int.	0.98	0.5%

Check Conditions:

Special Notes

TSI24066M_03P

Intersection 5-Tuesday



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: Ballinger Way NE/Civic Club Driveway & Beach Front Dr NE

Date of Count: Tue 08/06/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB) Ballinger Way NE				From South on (NB) Civic Club Driveway				From East on (WB) Beach Front Dr NE				From West on (EB) Beach Front Dr NE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	2	3	1	0	0	0	0	0	0	0	2	0	4	0	0	12
4:30 P	0	5	4	1	0	0	0	0	0	0	0	8	0	6	0	0	24
4:45 P	0	3	5	3	0	0	0	0	0	0	0	1	0	4	0	0	16
5:00 P	0	3	5	2	0	0	0	0	0	0	0	1	0	1	0	0	12
5:15 P	0	2	6	1	0	0	0	0	0	0	0	3	0	2	0	0	14
5:30 P	0	1	8	0	0	0	0	0	0	0	0	0	0	1	0	1	11
5:45 P	0	2	5	0	0	0	0	0	0	0	0	3	0	1	0	1	12
6:00 P	0	1	3	0	0	0	0	0	0	0	0	2	0	3	0	1	10
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	1	19	39	8	0	0	0	0	0	0	0	20	0	22	0	3	111
Peak Hour: 4:15 PM to 5:15 PM																	
Total	0	13	20	7	0	0	0	0	0	0	0	13	0	13	0	0	66
Approach	40				0				13				13				66
%HV	n/a				n/a				n/a				n/a				0.0%
PHF	0.91				n/a				0.41				0.54				0.69



Ballinger Way NE

66

40

26

4 Bike
6 Ped

Beach Front Dr NE

7 20 13

7 Ped 18
Bike 0

20 13

13 0

0

Beach Front Dr NE

13 0 0

13 26

0 Bike
0 Ped 13

4:15 PM to 5:15 PM

96 1.0 PHF Peak Hour Volume

PEDs Across:

	N	S	E	W	
INT 01	3	2	3	2	10
INT 02	1	2	0	5	8
INT 03	0	3	0	6	9
INT 04	3	0	0	0	3
INT 05	2	1	0	7	10
INT 06	2	3	0	8	13
INT 07	0	0	0	2	2
INT 08	0	1	1	11	13
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	11	12	4	41	68

Special Notes

Civic Club Driveway

20

6 Ped
0 Bike

20

0

Bicycles From:

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

PHF %HV

	PHF	%HV
EB	0.54	n/a
WB	0.41	n/a
NB	n/a	n/a
SB	0.91	n/a
T Int.	0.69	0.0%

Check In: 66 Out: 66

Conditions:

Intersection 6-Tuesday



Prepared for: **Transportation Solutions, Inc.**
Traffic Count Consultants, Inc.

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

WBE/DBE

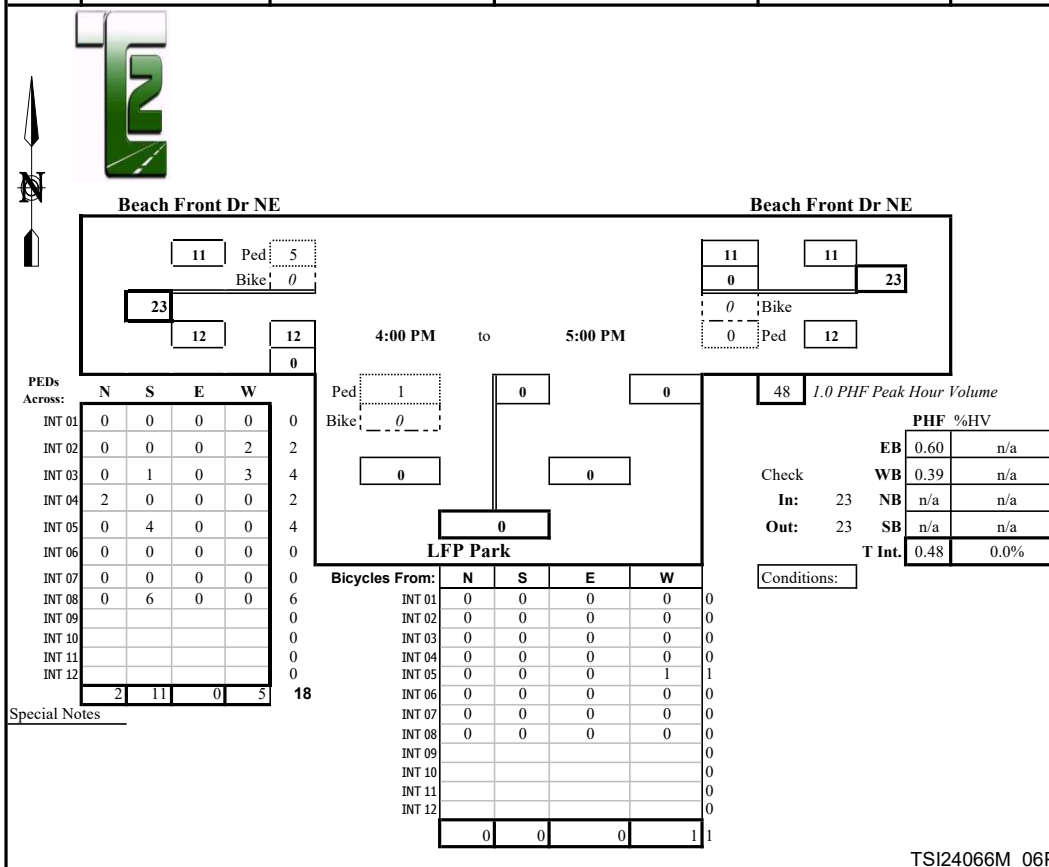
Intersection: LFP Park & Beach Front Dr NE

Date of Count: Tue 08/06/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				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	0	0	0	0	0	3	0	0	0	2	0	5
4:30 P	0	0	0	0	0	0	0	0	0	0	7	0	0	0	5	0	12
4:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5:00 P	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	5
5:15 P	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	5
5:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5:45 P	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	5
6:00 P	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
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	0	0	0	0	0	19	0	0	0	18	0	37
Peak Hour: 4:00 PM to 5:00 PM																	
Total	0	0	0	0	0	0	0	0	0	0	11	0	0	0	12	0	23
Approach	0				0				11				12				23
%HV	n/a				n/a				n/a				n/a				0.0%
PHF	n/a				n/a				0.39				0.60				0.48



TSI24066M_06P

Intersection 1-Saturday



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: West Driveway/NE 170th St & Bothell Way NE

Date of Count: Sat 08/10/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB) West Driveway				From South on (NB) NE 170th St				From East on (WB) Bothell Way NE				From West on (EB) Bothell Way NE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
11:15 A	0	19	0	7	0	2	5	5	2	11	249	6	4	10	249	1	564
11:30 A	0	22	2	11	0	3	0	4	2	4	258	3	1	11	255	0	573
11:45 A	0	16	1	16	0	1	3	8	4	6	285	4	2	19	279	1	639
12:00 P	0	22	1	14	0	3	1	4	2	4	295	6	4	15	322	0	687
12:15 P	0	28	8	12	0	1	2	6	2	5	266	5	1	19	302	1	655
12:30 P	0	14	1	15	0	3	1	6	1	2	336	7	2	22	265	2	674
12:45 P	0	20	0	19	0	0	1	7	1	9	284	6	4	25	302	0	673
1:00 P	0	35	3	15	0	1	1	3	7	4	323	1	1	17	278	2	683
1:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	176	16	109	0	14	14	43	21	45	2296	38	19	138	2252	7	5148

Peak Hour: 11:45 AM to 12:45 PM

Total	0	84	10	60	0	7	5	23	6	20	1181	24	11	81	1191	3	2689
-------	---	----	----	----	---	---	---	----	---	----	------	----	----	----	------	---	------

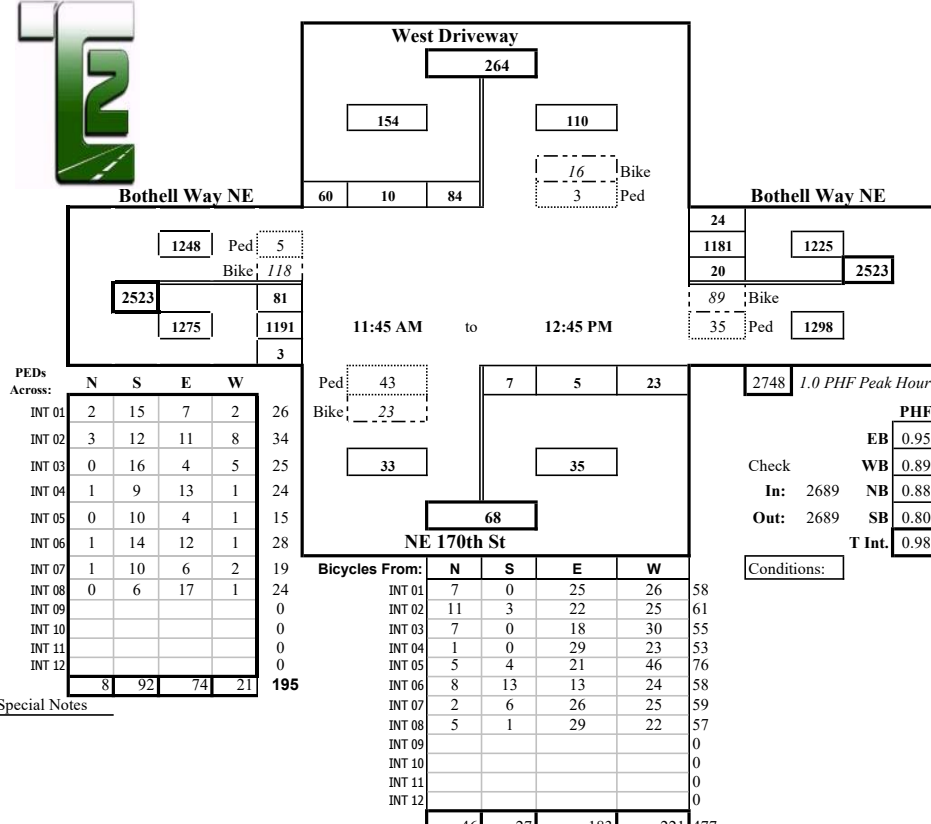
Approach	154
%HV	n/a
PHF	0.80

	35
	n/a
	0.88

	1225
	0.5%
	0.89

	1275
	0.9%
	0.95

	2689
	0.6%
	0.98



11:45 AM to 12:45 PM

1.0 PHF Peak Hour Volume

Check	PHF	%HV
EB	0.95	0.9%
WB	0.89	0.5%
IN 2689	NB	0.88 n/a
Out 2689	SB	0.80 n/a
T Int.	0.98	0.6%

Conditions:

Special Notes

TSI24066M_05M

Intersection 2-Saturday



Prepared for:

Transportation Solutions, Inc.

Traffic Count Consultants, Inc.

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

WBE/DBE

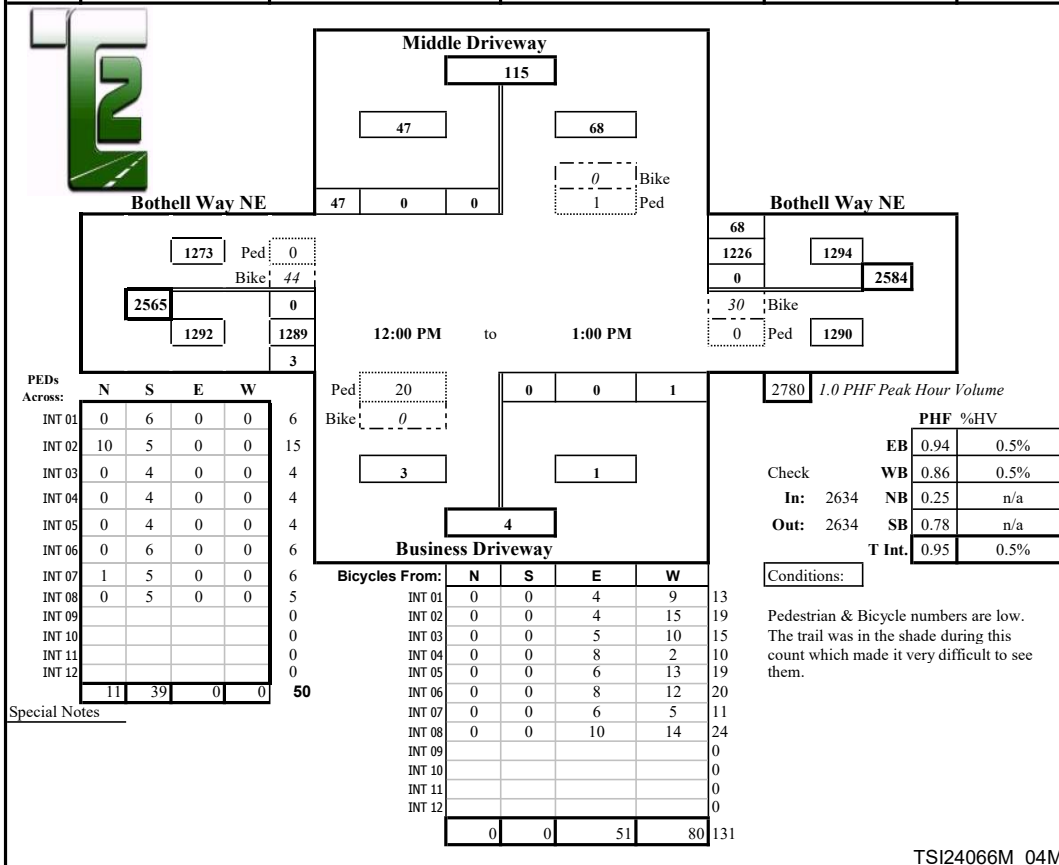
Intersection: Middle Driveway/Business Driveway & Bothell Way NE

Date of Count: Sat 08/10/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB) Middle Driveway				From South on (NB) Business Driveway				From East on (WB) Bothell Way NE				From West on (EB) Bothell Way NE				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
11:15 A	0	0	0	13	0	0	0	0	2	0	240	12	4	0	264	0	529
11:30 A	0	0	0	10	0	0	0	0	2	0	263	29	2	0	277	0	579
11:45 A	0	0	0	17	0	0	0	0	3	0	277	14	1	0	315	2	625
12:00 P	0	0	0	17	0	0	0	0	1	0	279	21	4	0	334	3	654
12:15 P	0	0	0	8	0	0	0	1	2	0	279	12	1	0	340	2	642
12:30 P	0	0	0	11	0	0	0	0	1	0	354	21	1	0	309	0	695
12:45 P	0	0	0	13	0	0	0	0	1	0	282	17	4	0	304	1	617
1:00 P	0	0	0	15	0	0	0	0	2	0	311	18	1	0	336	0	680
1:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	104	0	0	0	1	14	0	2285	144	18	0	2479	8	5021
Peak Hour: 12:00 PM to 1:00 PM																	
Total	0	0	0	47	0	0	0	1	6	0	1226	68	7	0	1289	3	2634
Approach	47				1				1294				1292				2634
%HV	n/a				n/a				0.5%				0.5%				0.5%
PHF	0.78				0.25				0.86				0.94				0.95



TSI24066M_04M

Intersection 3-Saturday



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: Ballinger Way NE & Bothell Way NE

Date of Count: Sat 08/10/2024

Location: Lake Forest Park, Washington

Checked By: Jen

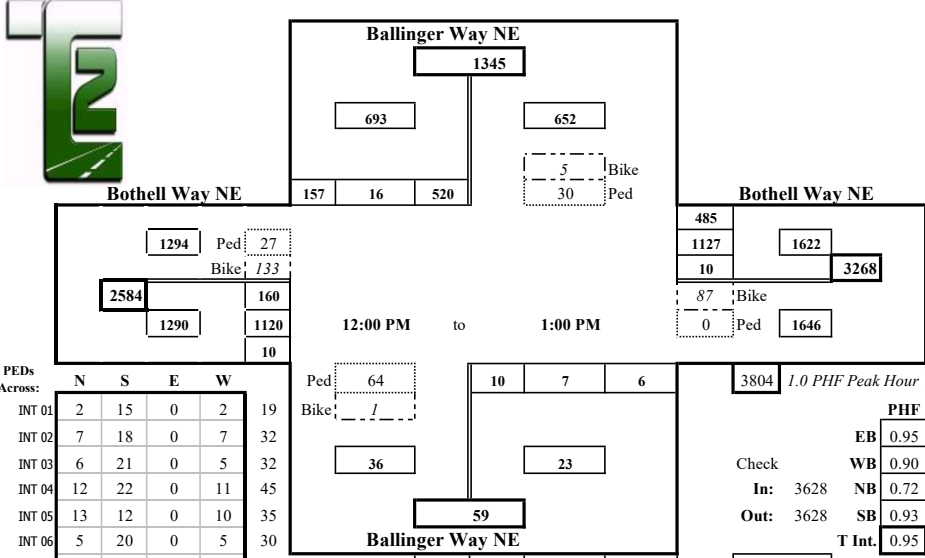
Time Interval	From North on (SB) Ballinger Way NE				From South on (NB) Ballinger Way NE				From East on (WB) Bothell Way NE				From West on (EB) Bothell Way NE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
11:15 A	1	100	3	30	0	1	2	4	5	2	221	128	4	35	227	2	755
11:30 A	2	146	4	25	0	2	2	0	4	0	265	94	3	28	249	0	815
11:45 A	2	112	1	41	1	1	3	3	4	1	249	124	2	47	267	1	850
12:00 P	0	122	2	29	0	0	1	1	3	3	271	110	2	37	297	0	873
12:15 P	1	128	7	45	0	2	2	3	3	4	244	130	3	52	286	3	906
12:30 P	0	144	2	41	0	2	1	1	1	1	332	118	1	33	273	3	951
12:45 P	1	134	2	37	0	1	2	1	2	4	261	102	4	39	262	3	848
1:00 P	1	114	5	34	0	5	2	1	2	1	290	135	1	36	299	1	923
1:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total Survey	8	1000	26	282	1	14	15	14	24	16	2133	941	20	307	2160	13	6921
--------------	---	------	----	-----	---	----	----	----	----	----	------	-----	----	-----	------	----	------

Peak Hour: 12:00 PM to 1:00 PM

Total	3	520	16	157	0	10	7	6	8	10	1127	485	9	160	1120	10	3628
-------	---	-----	----	-----	---	----	---	---	---	----	------	-----	---	-----	------	----	------

Approach	693				23				1622				1290				3628
%HV	0.4%				n/a				0.5%				0.7%				0.6%
PHF	0.93				0.72				0.90				0.95				0.95



PEDs Across:

	N	S	E	W	
INT 01	2	15	0	2	19
INT 02	7	18	0	7	32
INT 03	6	21	0	5	32
INT 04	12	22	0	11	45
INT 05	13	12	0	10	35
INT 06	5	20	0	5	30
INT 07	6	21	0	4	31
INT 08	6	11	0	8	25
INT 09					0
INT 10					0
INT 11					0
INT 12					0
Total	57	140	0	52	249

Bicycles From:

	N	S	E	W	
INT 01	0	0	38	38	76
INT 02	2	0	23	39	64
INT 03	1	0	17	34	52
INT 04	3	0	32	14	49
INT 05	1	0	23	50	74
INT 06	1	1	20	31	53
INT 07	1	0	25	24	50
INT 08	2	0	19	28	49
INT 09					0
INT 10					0
INT 11					0
INT 12					0
Total	11	1	197	258	467

1.0 PHF Peak Hour Volume

	PHF	%HV
EB	0.95	0.7%
WB	0.90	0.5%
NB	0.72	n/a
SB	0.93	0.4%
T Int.	0.95	0.6%

Check In: 3628 Out: 3628

Conditions:

Special Notes

TSI24066M_02M

Intersection 4-Saturday



Prepared for: **Transportation Solutions, Inc.**
Traffic Count Consultants, Inc.

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

WBE/DBE

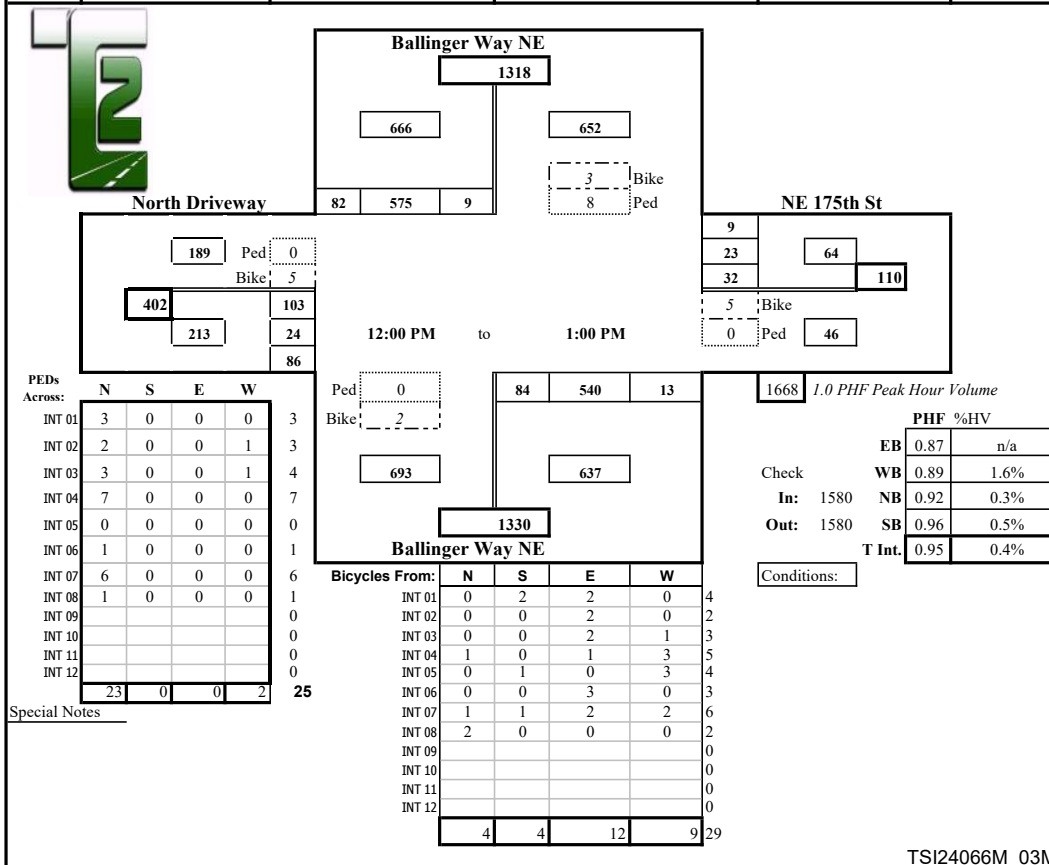
Intersection: Ballinger Way NE & NE 175th St/North Driveway

Date of Count: Sat 08/10/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB) Ballinger Way NE				From South on (NB) Ballinger Way NE				From East on (WB) NE 175th St				From West on (EB) North Driveway				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
11:15 A	2	2	114	36	2	21	134	2	0	7	6	4	0	27	7	13	373
11:30 A	1	1	137	29	2	16	117	6	0	8	1	7	1	32	7	26	387
11:45 A	2	1	137	22	1	13	141	8	0	5	6	1	0	17	7	13	371
12:00 P	0	3	131	13	2	21	137	6	0	9	8	5	0	18	4	12	367
12:15 P	1	0	135	23	0	17	135	3	0	7	7	3	0	29	6	24	389
12:30 P	0	4	153	17	0	13	148	3	0	10	7	1	0	18	8	27	409
12:45 P	1	1	145	22	1	25	117	3	0	8	2	2	0	24	4	12	365
1:00 P	1	4	142	20	1	29	140	4	1	7	7	3	0	32	6	23	417
1:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	8	16	1094	182	9	155	1069	35	1	61	44	26	1	197	49	150	3078
Peak Hour: 12:00 PM to 1:00 PM																	
Total	3	9	575	82	2	84	540	13	1	32	23	9	0	103	24	86	1580
Approach	666				637				64				213				1580
%HV	0.5%				0.3%				1.6%				n/a				0.4%
PHF	0.96				0.92				0.89				0.87				0.95



TSI24066M_03M

Intersection 5-Saturday



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: Ballinger Way NE/Civic Club Driveway & Beach Front Dr NE

Date of Count: Sat 08/10/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB) Ballinger Way NE				From South on (NB) Civic Club Driveway				From East on (WB) Beach Front Dr NE				From West on (EB) Beach Front Dr NE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
11:15 A	0	3	4	0	0	0	0	0	0	0	0	4	0	3	0	0	14
11:30 A	0	1	2	0	0	0	0	0	0	0	0	2	0	2	0	0	7
11:45 A	1	2	2	0	0	0	0	0	1	0	0	5	0	1	0	0	10
12:00 P	0	3	1	1	0	0	0	0	0	0	0	0	0	2	0	0	7
12:15 P	0	8	4	2	0	0	0	0	0	0	0	6	0	2	0	0	22
12:30 P	0	3	1	2	0	0	0	0	0	0	0	2	0	2	0	0	10
12:45 P	0	3	4	1	0	0	0	0	0	0	0	4	0	0	0	0	12
1:00 P	0	3	4	0	0	0	0	0	0	0	0	4	0	4	0	0	15
1:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	26	22	6	0	0	0	0	1	0	0	27	0	16	0	0	97

Peak Hour: 12:00 PM to 1:00 PM

Total	0	17	13	5	0	0	0	0	0	0	0	16	0	8	0	0	59
-------	---	----	----	---	---	---	---	---	---	---	---	----	---	---	---	---	----

Approach	35	0	16
%HV	n/a	n/a	n/a
PHF	0.63	n/a	0.67

Approach	8	59
%HV	n/a	0.0%
PHF	0.50	0.67



Ballinger Way NE

59

35

24

1 Bike
1 Ped

Beach Front Dr NE

5 13 17

16 Ped
0 Bike

13 8

8 0

0

Beach Front Dr NE

16 16 33

1 Bike
2 Ped

17

12:00 PM to 1:00 PM

7 Ped
0 Bike

13

0

13

0 0 0

88 1.0 PHF Peak Hour Volume

PEDs Across:	N	S	E	W	
INT 01	0	1	0	3	4
INT 02	2	2	0	4	8
INT 03	0	1	0	1	2
INT 04	1	0	2	0	3
INT 05	0	2	0	2	4
INT 06	0	3	0	9	12
INT 07	1	1	2	1	5
INT 08	0	1	0	4	5
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	4	11	4	24	43

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

PHF %HV	EB	WB	NB	SB	T Int.
0.50	n/a	n/a	n/a	n/a	0.0%
0.67	n/a	n/a	n/a	n/a	0.0%
0.63	n/a	n/a	n/a	n/a	0.0%
0.67	n/a	n/a	n/a	n/a	0.0%

Special Notes

Conditions:

TSI24066M_01M

Intersection 6-Saturday



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

Traffic Count Consultants, Inc.

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

WBE/DBE

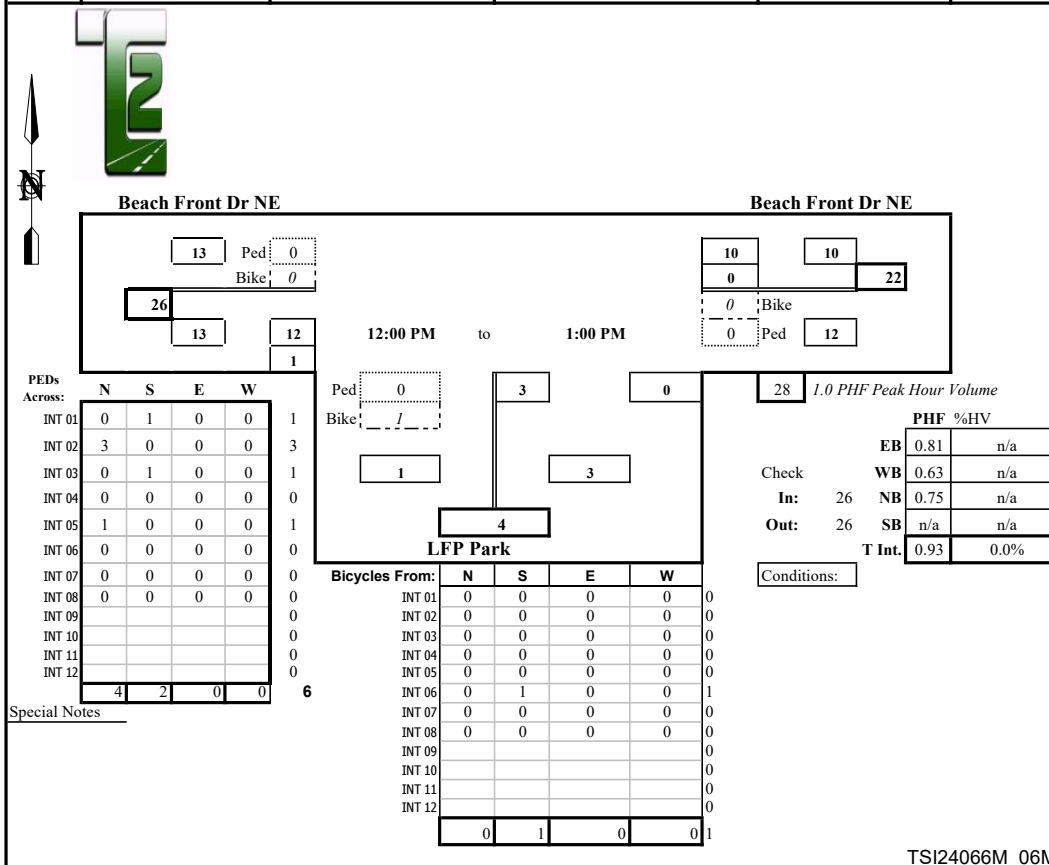
Intersection: LFP Park & Beach Front Dr NE

Date of Count: Sat 08/10/2024

Location: Lake Forest Park, Washington

Checked By: Jen

Time Interval	From North on (SB)				From South on (NB)				From East on (WB)				From West on (EB)				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
11:15 A	0	0	0	0	0	3	0	0	0	0	2	0	0	0	1	1	7
11:30 A	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	4
11:45 A	0	0	0	0	0	1	0	0	1	0	3	0	1	0	1	1	6
12:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3
12:15 P	0	0	0	0	0	1	0	0	0	0	2	0	0	0	4	0	7
12:30 P	0	0	0	0	0	1	0	0	0	0	1	0	0	0	3	0	5
12:45 P	0	0	0	0	0	1	0	0	0	0	3	0	0	0	2	1	7
1:00 P	0	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	7
1:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 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	7	0	0	1	0	18	0	1	0	17	4	46
Peak Hour: 12:00 PM to 1:00 PM																	
Total	0	0	0	0	0	3	0	0	0	0	10	0	0	0	12	1	26
Approach	0				3				10				13				26
%HV	n/a				n/a				n/a				n/a				0.0%
PHF	n/a				0.75				0.63				0.81				0.93



ITE Trip Generation Manual-Public Park Sheets

Land Use: 411

Public Park

Description

A public park is owned and operated by a municipal, county, state, or federal agency. The parks surveyed vary widely as to location, type, and number of facilities, including boating or swimming facilities, beaches, hiking trails, ball fields, soccer fields, campsites, and picnic facilities. Seasonal use of the individual sites differs widely as a result of the varying facilities and local conditions, such as weather. For example, some of the sites are used primarily for boating or swimming; others are used for softball games. Soccer complex (Land Use 488) is a related use.

Additional Data

The percentage of the park area that is used most intensively varies considerably within the studies contained in this land use. Therefore, caution should be used when using acres as an independent variable.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, New Jersey, New York, North Carolina, and Oregon.

Source Numbers

186, 392, 407, 709, 729, 852, 905

Public Park (411)

Vehicle Trip Ends vs: Acres
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 5

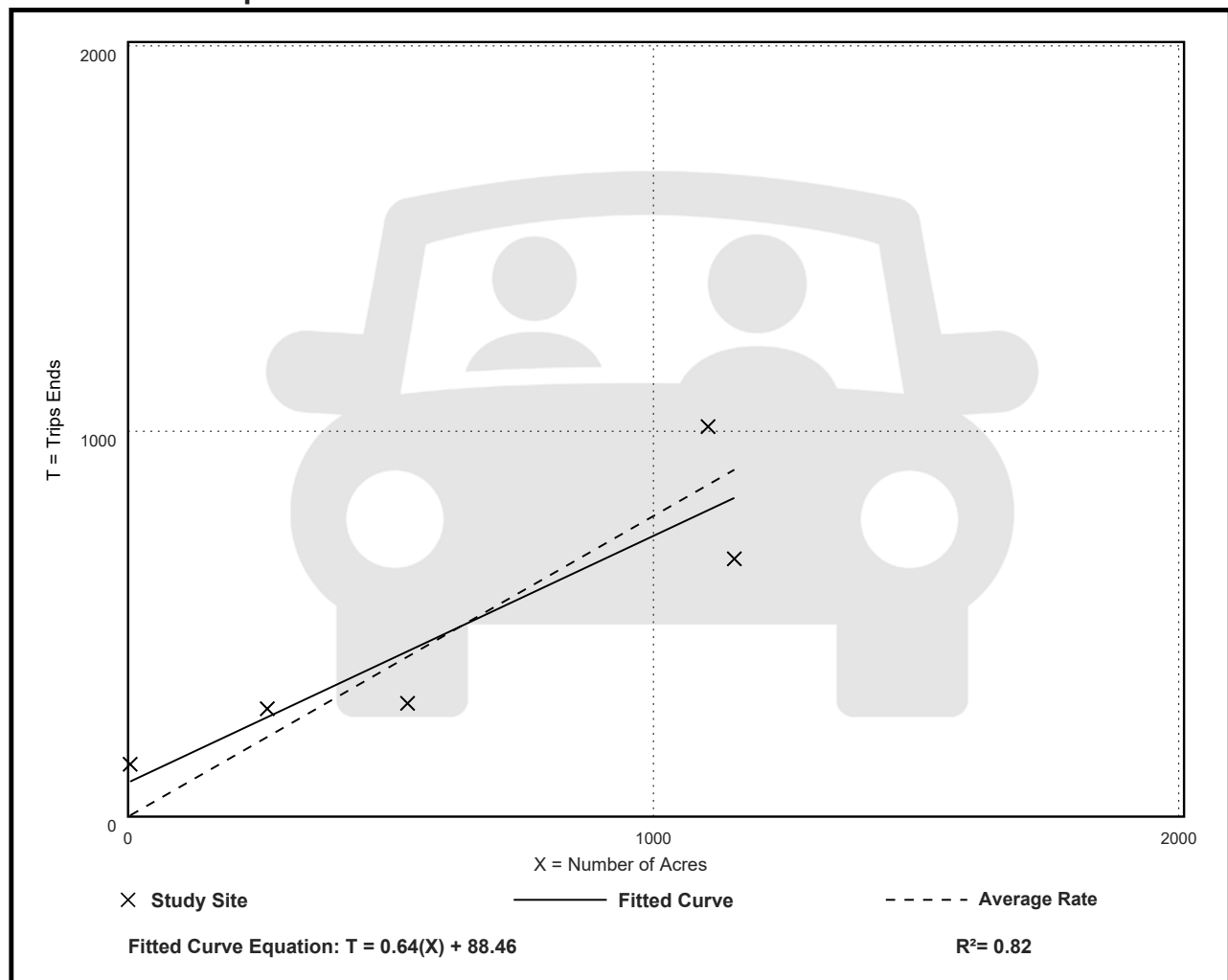
Avg. Num. of Acres: 612

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
0.78	0.55 - 34.00	1.36

Data Plot and Equation



Public Park (411)

Vehicle Trip Ends vs: Acres

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 6

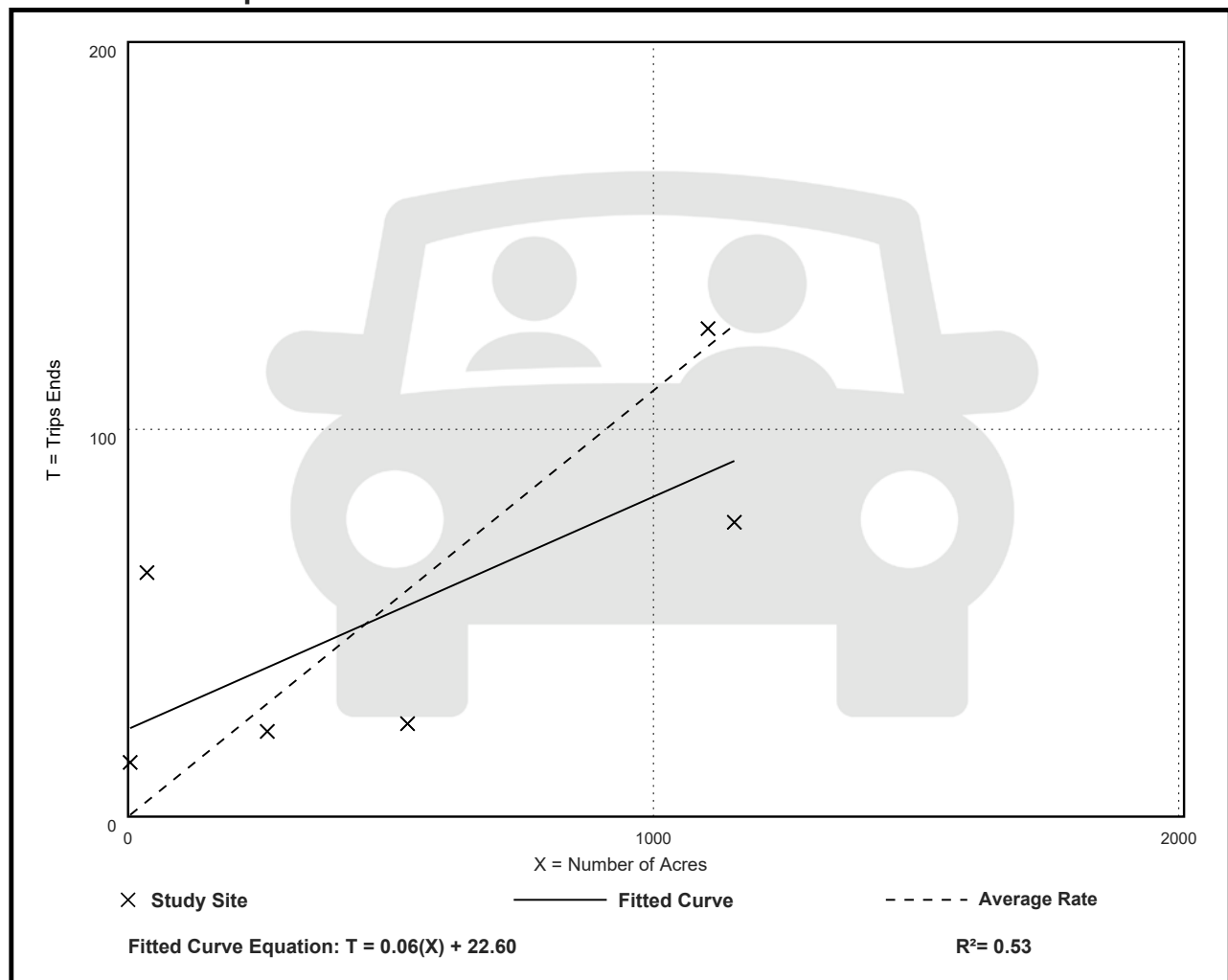
Avg. Num. of Acres: 516

Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
0.11	0.05 - 3.50	0.24

Data Plot and Equation



Public Park (411)

Vehicle Trip Ends vs: Acres

On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 4

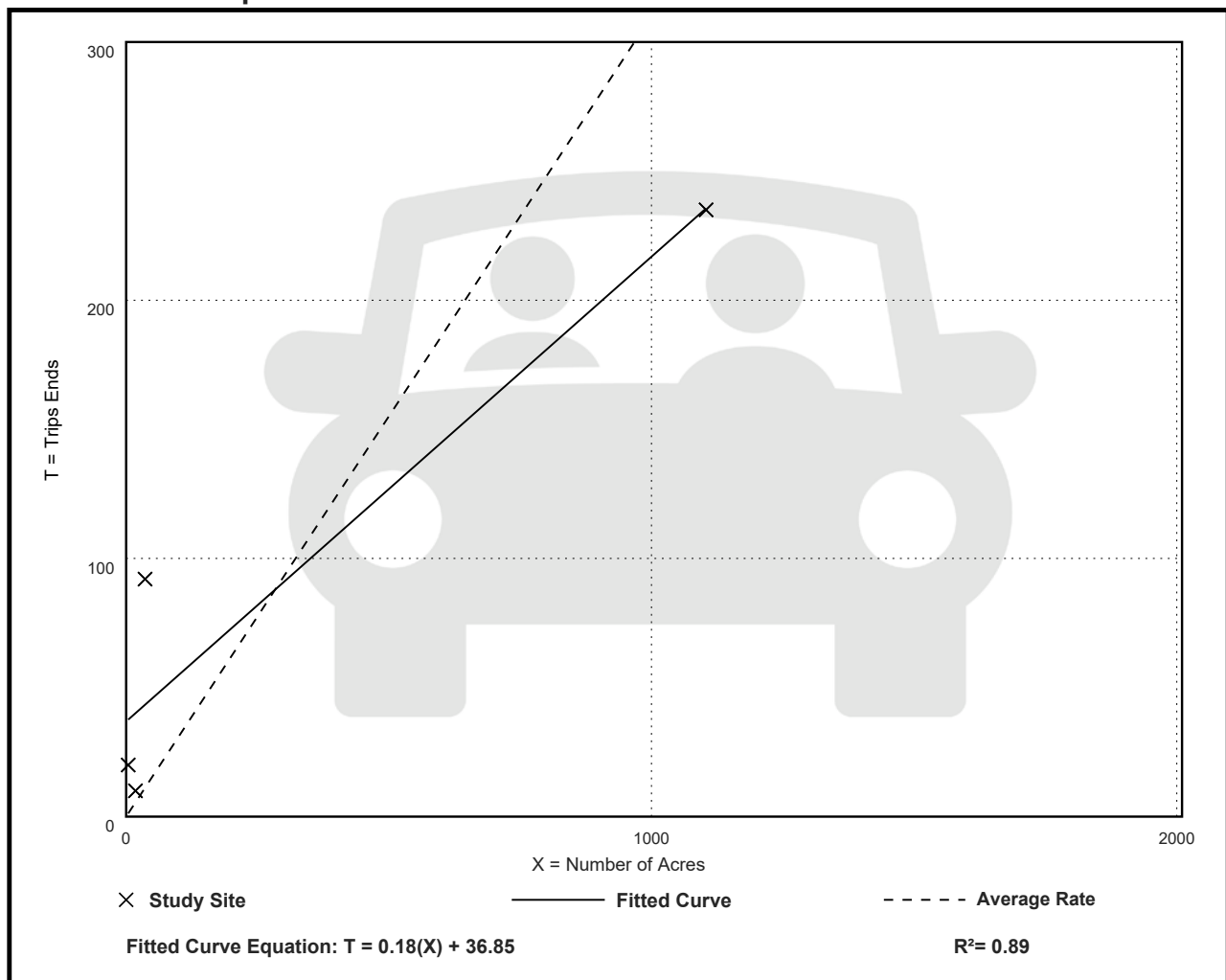
Avg. Num. of Acres: 290

Directional Distribution: 39% entering, 61% exiting

Vehicle Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
0.31	0.21 - 5.00	0.57

Data Plot and Equation



ITE Parking Generation Manual-Public Park Sheets

Public Park (411)

Peak Period Parking Demand vs: Acres

On a: Weekday (Monday - Friday)

Setting/Location: General Urban/Suburban

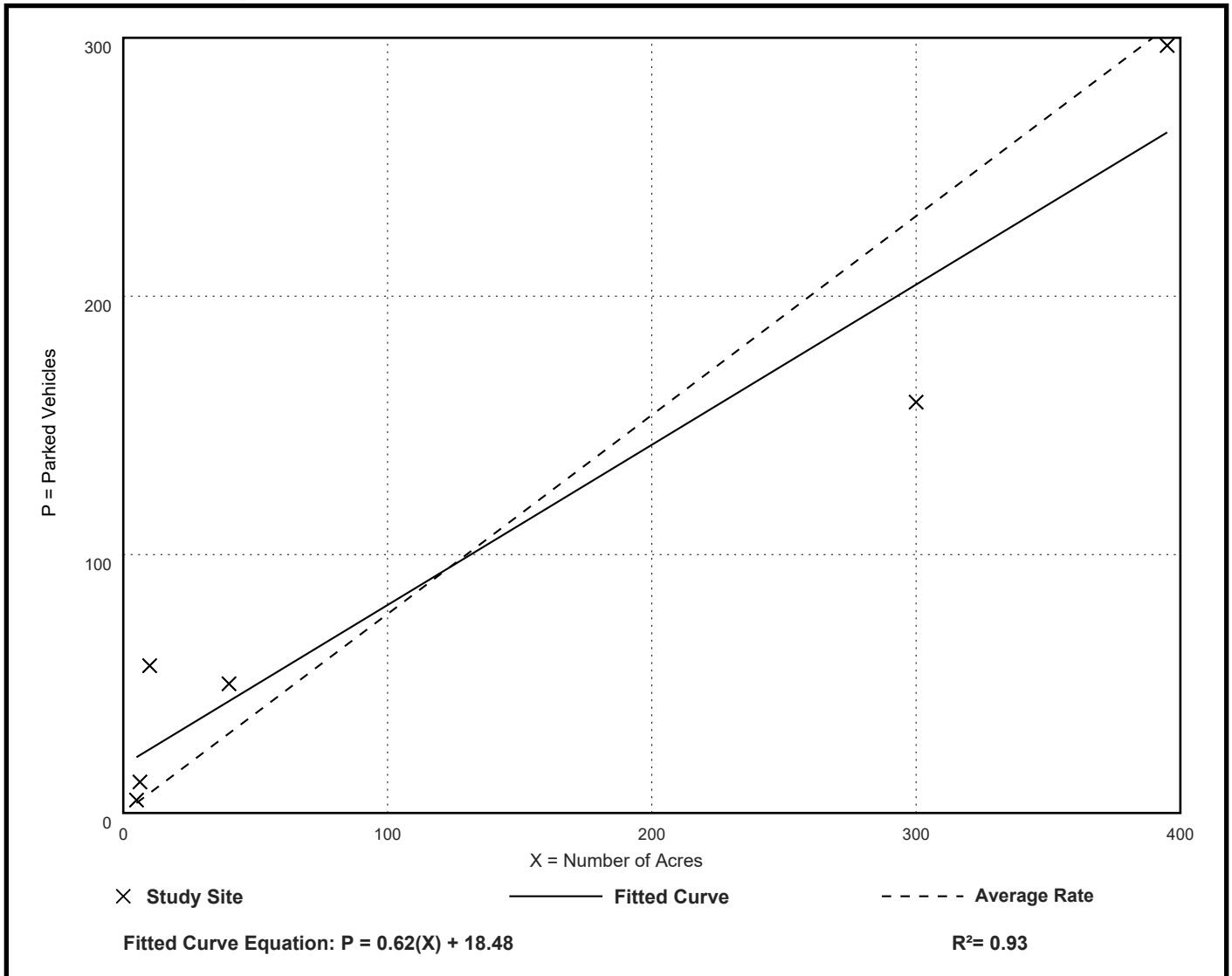
Number of Studies: 6

Avg. Num. of Acres: 126

Peak Period Parking Demand per Acre

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.77	0.53 - 5.71	0.83 / 5.52	***	0.66 (86%)

Data Plot and Equation



Public Park (411)

Peak Period Parking Demand vs: Acres

On a: Sunday

Setting/Location: General Urban/Suburban

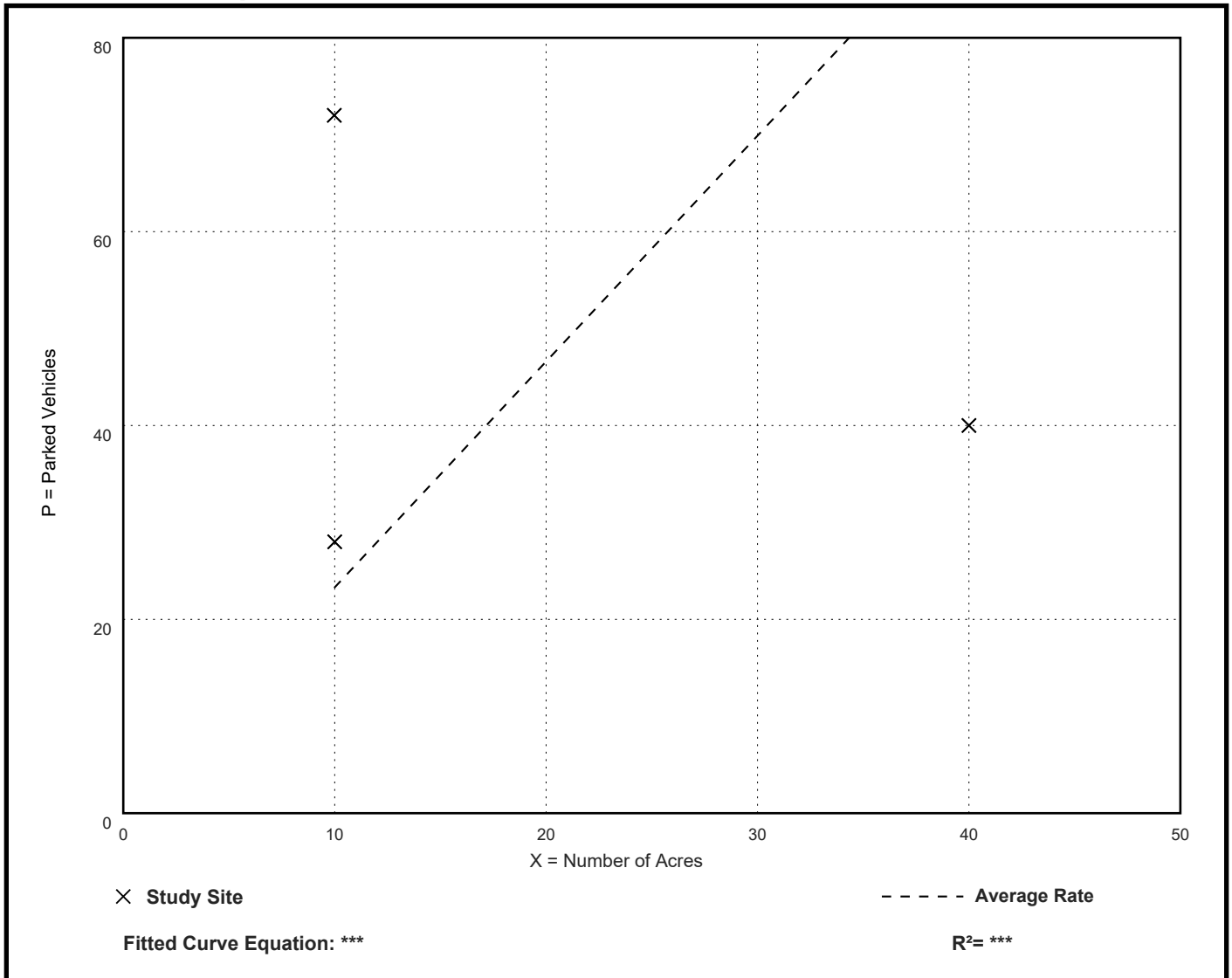
Number of Studies: 3

Avg. Num. of Acres: 20

Peak Period Parking Demand per Acre

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
2.33	1.00 - 7.21	1.58 / 7.21	***	2.79 (120%)

Data Plot and Equation



ITE Western District Trip Generation and Parking Generation Study

Spring 2023

TRIP AND PARKING GENERATION STUDY

**Santa Rosa Park,
San Luis Obispo**



View of Playground at Santa Rosa Park, Credit: City of SLO

Institute of Transportation Engineers (ITE)
Cal Poly, San Luis Obispo Chapter

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Letter of Submittal

March 31, 2023

Jeanne Acutanza
Technical Committee Chair
ITE Western District

Subject: Report for 2023 Western District ITE Data Collection Project

On behalf of the Institute of Transportation Engineers Student Chapter at Cal Poly, San Luis Obispo, I am pleased to submit our Trip and Parking Generation Study.

We collected and analyzed trip and parking generation data at our chosen site: Santa Rosa Park, located in San Luis Obispo, CA. This location corresponds to the ITE Land Use 411, identified as a public park land use in the ITE Trip and Parking Generation Manual. Our chapter previously surveyed this site during the COVID-19 pandemic in 2021 as part of the ITE Western District's Data Collection Project for that year. We collected data in February on a Wednesday, Saturday, and Sunday, mirroring the methods from the previous study. This report includes a summary of our data and findings from our study as well as an appendix with all of the trip and parking demand data forms used.

Please do not hesitate to contact me by phone at (805) 206-5576 or by email at amiciano@calpoly.edu if you have any questions.

Sincerely,



Ana Miciano
Secretary
Cal Poly ITE Student Chapter

Background

The Cal Poly, San Luis Obispo (SLO) Institute of Transportation Engineers (ITE) student chapter collected trip generation and parking demand data for Santa Rosa Park (SRP), located within the City of SLO, CA. An aerial view of the location is provided in Figure 1. The park, recognized as land use (LU) 411 in the ITE Trip and Parking Generation Manual, 11th Edition, contains several amenities including large grass fields, picnic areas, playground facilities, basketball courts, softball fields, a skate park, and a roller sport field. Throughout the year, the park is also host to a variety of community events. Table 1 provides relevant site characteristics.



Figure 1: Aerial view of the project site (Source: Google Earth)

Table 1. Site Characteristics

Address	1050 Oak St, San Luis Obispo, CA 93405
Total Acreage	9.98 acres
Total Number of Parking Spaces	132
Amenities	Grass fields, picnic areas, playground facilities, basketball courts, softball fields, a skate park, and a roller sport field

The Cal Poly, SLO ITE student chapter originally collected trip generation and parking demand data at this site in February 2021 for the 2021 ITE Western District Collection Project during the COVID-19 pandemic with the effects of the pandemic in mind. We collected data at the site again to provide further insight into the effects the pandemic had on travel patterns and demand for this land use type, which is underrepresented in the ITE trip generation manual.

Methodology

We performed pedestrian, bicycle, and vehicle trip generation and parking demand data collection by means of manual, in-person counts, recording counts on forms attached in the Appendix. Data collection methods for trip generation and parking demand adhered to the methods specified in the ITE Trip Generation Manual, 11 Edition, and the ITE Parking Generation Manual, 5th Edition.

The 12-hour counts were conducted from the hours of 7AM to 7PM on each of our designated data collection dates by 18 volunteers, most of whom are active Cal Poly SLO ITE student chapter members. Those three data collection dates were Sunday, February 5th, 2023; Wednesday, February 8th, 2023; and Saturday, February 11th, 2023. In our proposal, we originally designated Sunday, February 12th, 2023 as our Sunday data collection, mirroring our chapter's previous study in 2021 and its dates. However, we moved the Sunday data collection date to the previous weekend to account for potentially irregular trip generation and parking demand trends due to the Super Bowl Sunday holiday on Sunday, February 12, 2023.

Data Collection Results

Table 2 summarizes weather observations we made during data collection efforts, which may have impacted trip and parking patterns at the park. Tables 3, 4, and 5 summarize the trip generation data collected on a Sunday, Wednesday, and Saturday respectively. The peak hours, trip totals for each transportation mode, directional distribution, and acreage trip rate for the 12-hr, AM peak, and PM peak periods are included for each day. Table 6 summarizes the parking generation data and includes peak hours and highest parking demands for each day of data collection.

Table 2. Weather Observations on Data Collection Dates

	Temperature	Wind	Precipitation
Sunday, February 5th, 2023	High: 59°F, Low: 48°F	Windy, max wind speed of 18 mph	-
Wednesday, February 8th, 2023	High: 74°F, Low: 41°F	Windy, max wind speed of 16 mph	-
Saturday, February 11th, 2023	High: 54°F, Low: 39°F	Slightly, max wind speed of 10 mph	15-20 minute periods of rainfall throughout day

Table 3. Trip Generation Data Summary for Sunday

Sunday, February 5th, 2023			
Time Period	12-Hr Volume	AM Peak Hour	PM Peak Hour
Peak Hour	-	11:00 - 12:00	1:00 - 2:00
Vehicles In	250	23	28
Vehicles Out	234	20	30
Total Vehicle Trips	484	43	58
Directional Distribution In	52%	53%	48%
Directional Distribution Out	48%	47%	52%
Trip Rate (Trips/Acre)	48.50	4.31	5.81
Truck Trips	2	0	0
Bicycle Trips	47	1	4
Pedestrian Trips	339	28	46
Total Trips	872	72	108

Table 4. Trip Generation Data Summary for Weekday

Wednesday, February 8th, 2023			
Time Period	12-Hr Volume	AM Peak Hour	PM Peak Hour
Peak Hour	-	11:00 - 12:00	1:00 - 2:00
Vehicles In	271	25	25
Vehicles Out	251	31	42
Total Vehicle Trips	522	56	67
Directional Distribution In	52%	45%	37%
Directional Distribution Out	48%	55%	63%
Trip Rate (Trips/Acre)	52.30	5.61	6.71
Truck Trips	11	0	0
Bicycle Trips	176	28	14
Pedestrian Trips	361	18	44
Total Trips	1070	102	125

Table 5. Trip Generation Data Summary for Saturday

Saturday, February 11th, 2023			
Time Period	12-Hr Volume	AM Peak Hour	PM Peak Hour
Peak Hour	-	11:00 - 12:00	5:00 - 6:00
Vehicles In	192	21	22
Vehicles Out	188	28	28
Total Vehicle Trips	380	49	50
Directional Distribution In	51%	43%	44%
Directional Distribution Out	49%	57%	56%
Trip Rate (Trips/Acre)	38.08	4.91	5.01
Truck Trips	10	2	0
Bicycle Trips	44	3	6
Pedestrian Trips	197	7	13
Total Trips	631	61	69

Table 6. Parking Generation Data Summary

Day	Sunday	Wednesday	Saturday
Date	February 5, 2023	February 8, 2023	February 11, 2023
Peak Hour	12:00 PM - 1:00 PM, 1:00 PM - 2:00 PM	1:00 PM - 2:00 PM	11:00 AM - 12:00 PM
Peak Parking Demand	40	52	36
Parking Rate (Parking Demand/Acre)	4.01	5.21	3.61

ITE Trip Generation Comparison

Table 7 compares the daily average trip rates given in the 11th Edition ITE Trip Generation Manual for LU 441 to the calculated trip rates from the data collection at SRP for this study in 2023 (after the pandemic) and the previous study in 2021 (during the pandemic). Please note that the rates provided by the 11th Edition ITE Trip Generation Manual are 24-hour rates as opposed to the rates collected during the studies at SRP, which are 12-hour rates. As such, the daily rates for SRP are not included in the table and can be assumed to be slightly higher than the 12-hour rates. Further, the 11th Edition ITE Trip Generation Manual does not separate AM and PM peak periods.

Table 7: Trip Generation Comparison

Time Period	11th Edition Avg. Trip Rate (Trips/Acre)	2023 SRP Trip Rate (Trips/Acre)	2021 SRP Trip Rate (Trips/Acre)
Weekday	0.78	–	–
Weekday AM	0.07	5.61	7.52
Weekday PM	0.11	6.71	11.92
Saturday	1.96	–	–
Saturday Peak	0.28	5.01	10.22
Sunday	2.19	–	–
Sunday Peak	0.31	5.81	14.02

ITE Parking Generation Comparison

Table 8 directly compares the daily (24-hour) parking demand rates from the 5th Edition of the ITE Parking Generation Manual and the 12-hour parking demand rates for SRP for this study in 2023 (after the pandemic) and the previous study in 2021 (during the pandemic). Please note that the values given in the 5th Edition ITE Parking Generation Manual are 24-hour rates, while the values calculated for our study were 12-hour rates.

Table 8: Parking Generation Comparison

Time Period	5th Edition Daily Parking Rate (Parking Demand/Acre)	2023 SRP Daily Parking Rate (Parking Demand/Acre)	2021 SRP Daily Parking Rate (Parking Demand/Acre)
Saturday	0.47	3.61	6.71
Sunday	1.21	4.01	7.21

Analysis and Conclusion

SRP is situated near the center of the City of SLO along SR-1, a major state highway that is heavily traveled by tourists and commuters, and is easily accessible to pedestrians and bicyclists. The site is also served by local and regional transit, courtesy of a neighboring bus stop on the west side of the lot.

As demonstrated by Tables 7 and 8, there are large discrepancies between the trip and parking rates from the ITE Trip and Parking Generation Manuals and those from the studies at SRP in 2023 and 2021. The trip rates calculated for SRP are much greater than the trip rates in the manual. The given parking rates are also significantly different from the calculated rates using data from the conducted study. The

values calculated for Sunday seem to have the greatest discrepancy. There could be a few reasons for this.

First, SRP contains several amenities and is home to many organized community events, a few of which we observed during our data collection. A few of those events include roller derbies and organized baseball, soccer, and roller hockey practices. As those events were happening, there was still regular activity at the skatepark and playground facilities. As such, in proportion to its size, SRP generates a lot of trips for a public park. In fact, the trip and parking rates from the ITE Trip and Parking Generation Manuals were found from parks much larger than SRP with acreages ranging from 290 - 612 acres from the 11th Edition Trip Generation Manual and acreages running from 14 - 132 from the 5th Edition Parking Generation Manual—with SRP having a total acreage of 9.98 acres by comparison.

Further, we noticed that total pedestrian counts entering the park were much higher than pedestrian counts leaving the park; individuals coming to the park by scooter or skateboard were counted as pedestrians. We noticed that several kids came to the park by skateboard, scooter, or on foot, but were picked up in vehicles by their parents after a few hours or remained at the park after data collection hours had concluded. These may account for the uneven distribution we noticed. This pattern was noticed all three days, but particularly on Saturday where 125 pedestrians entered the park, but 72 exited, as seen in Appendix A.

Tables 7 and 8 also compare the trip and parking generation rates between the studies performed by our chapter in 2021 during the pandemic and in 2023 after the pandemic. The tables demonstrate that since the pandemic, there has been an overall decrease in trip and parking generation trends to SRP, with the values from 2021 being greater than those found in 2023. During the pandemic and subsequent quarantine, more people were at home and usual activities were lessened. As a result, outdoor activities were encouraged and more trips were made to local parks, including SRP.

During our data collection efforts we experienced bouts of inclement weather, which are mentioned in Table 2 in the Data Collection Results section. It rained periodically throughout Saturday and was rather windy on Sunday and Wednesday. Weather patterns can directly impact travel patterns to and from a particular site and it may have impacted our study as well with Saturday seeing the lowest total number of trips to SRP.

Acknowledgments

Jeanne Acutanza

ITE Western District Technical Committee

Student Endowment Fund

ITE Western District (District 6)

Philip Yang

Dr. Anurag Pande

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Kate Codere

Liam Keeton

Max Messmer

Richie Frerking

Sam Moran

Sara Calderon

Tyler Bush

Savannah Wood

Appendices

Appendix A - ITE Trip Generation Data Forms

Sunday, February 5, 2023 Trip Generation Data Form
Wednesday, February 8, 2023 Trip Generation Data Form
Saturday, February 11, 2023 Trip Generation Data Form

Appendix B - ITE Parking Demand Survey Form

Appendix C - Trip Generation Tally Forms (include field notes)

Sunday, February 5, 2023 Trip Generation Tally Form
Wednesday, February 8, 2023 Trip Generation Tally Form
Saturday, February 11, 2023 Trip Generation Tally Form

Appendix D - Parking Generation Tally Forms (include field notes)

Sunday, February 5, 2023 Parking Generation Tally Form
Wednesday, February 8, 2023 Parking Generation Tally Form
Saturday, February 11, 2023 Parking Generation Tally Form

Trip Generation Data Form (Part 1)

Land Use/Building Type: ¹ Public Park			ITE Land Use Code: 411		
Source: ITE Trip Generation Manual 11th Edition			Source No. (ITE use only):		
Name of Development: Santa Rosa Park			Day of the Week: Sunday		
City: San Luis Obispo	State/Province: CA	Zip/Postal Code: 90029	Day: 5	Month: February	Year: 2023
Country: USA			Metropolitan Area: San Luis Obispo-Paso Robles		

1. For fast-food land use, please specify if hamburger- or nonhamburger-based.

Location Within Area: ☐ (1) CBD ☐ (3) Suburban (Non-CBD) ☐ (5) Rural ☒ (2) Urban (Non-CBD) ☐ (4) Suburban CBD ☐ (6) Freeway Interchange Area (Rural) ☐ (7) Not Given				Detailed Description of Development:³ Public Park, located within an urban area, with ample amounts of amenities. Amenities include large grass fields, picnic areas, playground facilities, basketball courts, softball fields, a large skate park, roller sport field, and various paved walking paths throughout Santa Rosa Park.	
Independent Variable: (include data for as many as possible)²		Actual	Estimated	Actual	Estimated
_____ (1) Employees (#)	☐	☐	132	(9) Parking Spaces (% occupied: _____) ☒	☐
_____ (2) Persons (#)	☐	☐	_____	(10) Beds (% occupied: _____) ☐	☐
_____ (3) Total Units (#) (indicate unit: _____)	☐	☐	_____	(11) Seats (#) ☐	☐
_____ (4) Occupied Units (#) (indicate unit: _____)	☐	☐	_____	(12) Servicing Positions/Vehicle Fueling Positions ☐	☐
_____ (5) Gross Floor Area (gross sq. ft.) _____ (% of development occupied _____)	☐	☐	_____	(13) Shopping Center % Out-parcels/pads ☐	☐
_____ (6) Net Rentable Area (sq. ft.)	☐	☐	_____	(14) A.M. Peak Hour Volume of Adjacent Street Traffic ☐	☐
_____ (7) Gross Leasable Area (sq. ft.) _____ (% of development occupied _____)	☐	☐	_____	(15) P.M. Peak Hour Volume of Adjacent Street Traffic ☐	☐
9.98 (8) Total Acres (% developed: _____)	☐	☒	_____	(16) Other _____ ☐	☐
			_____	(17) Other _____ ☐	☐

2. Definitions for several independent variables can be found in the *Trip Generation, Second Edition, User's Guide Glossary*.

3. Please provide all pertinent information to describe the subject project, including the presence of bicycle/pedestrian facilities. To report bicycle/pedestrian volumes, please refer to Part 4 of this data form.

Other Data: Vehicle Occupancy (#): _____ A.M. _____ P.M. _____ 24-hour % Percent by Transit: _____ A.M. % _____ P.M. % _____ 24-hour % Percent by Carpool/Vanpool: _____ A.M. % _____ P.M. % _____ 24-hour % Employees by Shift: First Shift: Start Time _____ End Time _____ Employees (#) _____ Second Shift: Start Time _____ End Time _____ Employees (#) _____ Third Shift: Start Time _____ End Time _____ Employees (#) _____ Parking Cost on Site: Hourly _____ Daily _____			Transportation Demand Management (TDM) Information: At the time of this study, was there a TDM program (that may have impacted the trip generation characteristics of this site) underway? ☒ No ☐ Yes (If yes, please check appropriate box/boxes, describe the nature of the TDM program(s) and provide a source for any studies that may help quantify this impact. Attach additional sheets if necessary) ☐ (1) Transit Service ☐ (2) Carpool Programs ☐ (3) Vanpool Programs ☐ (4) Bicycle/Pedestrian Facilities and Site Improvements ☐ (5) Employer Support Measures ☐ (6) Preferential HOV Treatments ☐ (7) Transit and Ridesharing Incentives ☐ (8) Parking Supply and Pricing Management ☐ (9) Tolls and Congestion Pricing ☐ (10) Variable Work Hours/Compressed Work Weeks ☐ (11) Telecommuting ☐ (12) Other _____		
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Please Complete Form on Other Side

ite Institute of Transportation Engineers
Trip Generation Data Form (Part 2)

Summary of Driveway Volumes

(All = All Vehicles Counted, Including Trucks; Trucks = Heavy Duty Trucks and Buses)

	Average Weekday (M-F)						Saturday						Sunday					
	Enter		Exit		Total		Enter		Exit		Total		Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks
12-Hour Volume													251	1	235	1	486	2
☒ Hour Volume 7 AM - 7 PM																		
A.M. Peak Hour of Adjacent Street Traffic (7 - 9) Time:																		
P.M. Peak Hour of Adjacent Street Traffic (4 - 6) Time:																		
A.M. Peak Hour Generator ² Time:																		
P.M. Peak Hour Generator ² Time:																		
Peak Hour Generator ³ Time (Weekend): 1 PM - 2 PM													28	0	30	0	58	0

¹ Highest hourly volume between 7 a.m. and 9 a.m. (4 p.m. and 6 p.m.). Please specify the peak hour.

² Highest hourly volume during the a.m. or p.m. period. Please specify the peak hour.

³ Highest hourly volume during the entire day. Please specify the peak hour.

Please refer to the *Trip Generation User's Guide* for full definition of terms.

Hourly Driveway Volumes- Average Weekday (M-F)

A.M. Period	Enter		Exit		Total		Mid-Day Period	Enter		Exit		Total		P.M. Period	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks		All	Trucks	All	Trucks	All	Trucks		All	Trucks	All	Trucks	All	Trucks
6:00-7:00							11:00-12:00							3:00-4:00						
6:15-7:15							11:15-12:15							3:15-4:15						
6:30-7:30							11:30-12:30							3:30-4:30						
6:45-7:45							11:45-12:45							3:45-4:45						
7:00-8:00							12:00-1:00							4:00-5:00						
7:15-8:15							12:15-1:15							4:15-5:15						
7:30-8:30							12:30-1:30							4:30-5:30						
7:45-8:45							12:45-1:45							4:45-5:45						
8:00-9:00							1:00-2:00							5:00-6:00						

☒ Check if Part 3, 4 and/or additional information is attached.

Survey conducted by: Name: Ana Micano
 Organization: Cal Poly SLO ITE
 Address: 1 Grand Ave.
 City/State/Zip: San Luis Obispo, CA 93405
 Telephone #: (805) 206-5576 Fax #: N/A E-mail: amicano@calpoly.edu

Please return to: Institute of Transportation Engineers
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 1099 14th Street, NW, Suite 300 West
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 ITE on the Web: www.ite.org



Institute of Transportation Engineers

Trip Generation Data Form (Part 3)**Name/Organization:** Cal Poly SLO ITE**City/State:** San Luis Obispo, CA**Telephone Number:** (805) 206-5576*Detailed Driveway Volumes: Attach this sheet to Parts 1 and 2 if you are providing additional information.***Day of the week:** Sunday

(All = All Vehicles Counted, Including Trucks; Trucks = Heavy Duty Trucks and Buses)

A.M. Period	Enter		Exit		Total		P.M. Period	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks		All	Trucks	All	Trucks	All	Trucks
12:00-12:15							12:00-12:15			3		3	
12:15-12:30							12:15-12:30	7		4		11	
12:30-12:45							12:30-12:45	8		9		17	
12:45-1:00							12:45-1:00	12		2		14	
1:00-1:15							1:00-1:15	10		8		18	
1:15-1:30							1:15-1:30	7		8		15	
1:30-1:45							1:30-1:45	5		4		9	
1:45-2:00							1:45-2:00	6		10		16	
2:00-2:15							2:00-2:15	2		6		8	
2:15-2:30							2:15-2:30	10		10		20	
2:30-2:45							2:30-2:45	3		11		14	
2:45-3:00							2:45-3:00	7		4		11	
3:00-3:15							3:00-3:15	10		5		15	
3:15-3:30							3:15-3:30	5		9		14	
3:30-3:45							3:30-3:45	4		3		7	
3:45-4:00							3:45-4:00	8		5		13	
4:00-4:15							4:00-4:15	6		3		9	
4:15-4:30							4:15-4:30	6		11		17	
4:30-4:45							4:30-4:45	10		10		20	
4:45-5:00							4:45-5:00	10		8		18	
5:00-5:15							5:00-5:15	3		5		8	
5:15-5:30							5:15-5:30	8		4		12	
5:30-5:45							5:30-5:45	8		8		16	
5:45-6:00							5:45-6:00	5		3		8	
6:00-6:15							6:00-6:15	7	1	5	1	12	2
6:15-6:30							6:15-6:30	2		10		12	
6:30-6:45							6:30-6:45	2		10		12	
6:45-7:00							6:45-7:00	3		7		10	
7:00-7:15	2				2		7:00-7:15						
7:15-7:30			1		1		7:15-7:30						
7:30-7:45			1		1		7:30-7:45						
7:45-8:00	1		1		2		7:45-8:00						
8:00-8:15	2		2		4		8:00-8:15						
8:15-8:30	3		1		4		8:15-8:30						
8:30-8:45	3		2		5		8:30-8:45						
8:45-9:00	2		4		6		8:45-9:00						
9:00-9:15	2		1		3		9:00-9:15						
9:15-9:30	2		2		4		9:15-9:30						
9:30-9:45	12		1		13		9:30-9:45						
9:45-10:00	7		4		11		9:45-10:00						
10:00-10:15	2		1		3		10:00-10:15						
10:15-10:30	4		1		5		10:15-10:30						
10:30-10:45	10		3		13		10:30-10:45						
10:45-11:00	2		5		7		10:45-11:00						
11:00-11:15	6		7		13		11:00-11:15						
11:15-11:30	7		5		12		11:15-11:30						
11:30-11:45	7		4		11		11:30-11:45						
11:45-12:00	3		4		7		11:45-12:00						

ite Institute of Transportation Engineers
Trip Generation Data Form (Part 4)

Summary of Bicycle Volumes

	Average Weekday (M-F)			Saturday			Sunday		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
12-Hour Volume							29	18	47
X Hour Volume 7 AM - 7 PM									
A.M. Peak Hour of Adjacent Street Traffic (7 – 9) Time:									
P.M. Peak Hour of Adjacent Street Traffic (4 – 6) Time:									
A.M. Peak Hour Generator ² Time:									
P.M. Peak Hour Generator ² Time:									
Peak Hour Generator ³ Time (Weekend): 6 PM - 7 PM							5	2	7

¹. Highest hourly volume between 7 a.m. and 9 a.m. (4 p.m. and 6 p.m.) as defined in Trip Generation Data Form (Part 2). Please specify the peak hour.

². Highest hourly volume during the a.m. or p.m. period. Please specify the peak hour.

³. Highest hourly volume during the entire day. Please specify the peak hour. Please attach supplemental hourly volumes.

Please refer to the *Trip Generation User's Guide* for full definition of terms.

Summary of Pedestrian Volumes

	Average Weekday (M-F)			Saturday			Sunday		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
12-Hour Volume							211	128	339
X Hour Volume 7 AM - 7 PM									
A.M. Peak Hour of Adjacent Street Traffic (7 – 9) Time:									
P.M. Peak Hour of Adjacent Street Traffic (4 – 6) Time:									
A.M. Peak Hour Generator ² Time:									
P.M. Peak Hour Generator ² Time:									
Peak Hour Generator ³ Time (Weekend): 1 PM - 2 PM							29	17	46

Survey conducted by: Name: Ana Micano
 Organization: Cal Poly SLO ITE
 Address: 1 Grand Ave.
 City/State/Zip: San Luis Obispo, CA 93405
 Telephone #: (805) 206-5576 Fax #: N/A E-mail: amicano@calpoly.edu

Please return to: Institute of Transportation Engineers
 Technical Projects Division
 1099 14th Street, NW, Suite 300 West
 Washington, DC 20005-3438 USA
 Telephone: +1 202-289-0222
 Fax: +1 202-289-7722
 ITE on the Web: www.ite.org

Trip Generation Data Form (Part 1)

Land Use/Building Type: ¹ Public Park			ITE Land Use Code: 411		
Source: ITE Trip Generation Manual 11th Edition			Source No. (ITE use only):		
Name of Development: Santa Rosa Park			Day of the Week: Wednesday		
City: San Luis Obispo	State/Province: CA	Zip/Postal Code: 90029	Day: 8	Month: February	Year: 2023
Country: USA			Metropolitan Area: San Luis Obispo-Paso Robles		

1. For fast-food land use, please specify if hamburger- or nonhamburger-based.

Location Within Area: ☐ (1) CBD ☐ (3) Suburban (Non-CBD) ☐ (5) Rural ☒ (2) Urban (Non-CBD) ☐ (4) Suburban CBD ☐ (6) Freeway Interchange Area (Rural) ☐ (7) Not Given				Detailed Description of Development:³ Public Park, located within an urban area, with ample amounts of amenities. Amenities include large grass fields, picnic areas, playground facilities, basketball courts, softball fields, a large skate park, roller sport field, and various paved walking paths throughout Santa Rosa Park.	
Independent Variable: (include data for as many as possible)²		Actual	Estimated	Actual	Estimated
_____ (1) Employees (#)	☐	☐	132	(9) Parking Spaces (% occupied: _____) ☒	☐
_____ (2) Persons (#)	☐	☐	_____	(10) Beds (% occupied: _____) ☐	☐
_____ (3) Total Units (#) (indicate unit: _____)	☐	☐	_____	(11) Seats (#) ☐	☐
_____ (4) Occupied Units (#) (indicate unit: _____)	☐	☐	_____	(12) Servicing Positions/Vehicle Fueling Positions ☐	☐
_____ (5) Gross Floor Area (gross sq. ft.) _____ (% of development occupied _____)	☐	☐	_____	(13) Shopping Center % Out-parcels/pads ☐	☐
_____ (6) Net Rentable Area (sq. ft.)	☐	☐	_____	(14) A.M. Peak Hour Volume of Adjacent Street Traffic ☐	☐
_____ (7) Gross Leasable Area (sq. ft.) _____ (% of development occupied _____)	☐	☐	_____	(15) P.M. Peak Hour Volume of Adjacent Street Traffic ☐	☐
9.98 (8) Total Acres (% developed: _____)	☐	☒	_____	(16) Other _____ ☐	☐
			_____	(17) Other _____ ☐	☐

2. Definitions for several independent variables can be found in the *Trip Generation, Second Edition, User's Guide Glossary*.

3. Please provide all pertinent information to describe the subject project, including the presence of bicycle/pedestrian facilities. To report bicycle/pedestrian volumes, please refer to Part 4 of this data form.

Other Data: Vehicle Occupancy (#): _____ A.M. _____ P.M. _____ 24-hour % Percent by Transit: _____ A.M. % _____ P.M. % _____ 24-hour % Percent by Carpool/Vanpool: _____ A.M. % _____ P.M. % _____ 24-hour % Employees by Shift: <table border="1"> <tr> <td>First Shift:</td> <td>Start Time _____</td> <td>End Time _____</td> <td>Employees (#) _____</td> </tr> <tr> <td>Second Shift:</td> <td>Start Time _____</td> <td>End Time _____</td> <td>Employees (#) _____</td> </tr> <tr> <td>Third Shift:</td> <td>Start Time _____</td> <td>End Time _____</td> <td>Employees (#) _____</td> </tr> </table> Parking Cost on Site: _____ Hourly _____ Daily _____			First Shift:	Start Time _____	End Time _____	Employees (#) _____	Second Shift:	Start Time _____	End Time _____	Employees (#) _____	Third Shift:	Start Time _____	End Time _____	Employees (#) _____	Transportation Demand Management (TDM) Information: At the time of this study, was there a TDM program (that may have impacted the trip generation characteristics of this site) underway? ☒ No ☐ Yes (If yes, please check appropriate box/boxes, describe the nature of the TDM program(s) and provide a source for any studies that may help quantify this impact. Attach additional sheets if necessary) <table border="1"> <tr> <td>☐ (1) Transit Service</td> <td>☐ (5) Employer Support Measures</td> <td>☐ (9) Tolls and Congestion Pricing</td> </tr> <tr> <td>☐ (2) Carpool Programs</td> <td>☐ (6) Preferential HOV Treatments</td> <td>☐ (10) Variable Work Hours/Compressed Work Weeks</td> </tr> <tr> <td>☐ (3) Vanpool Programs</td> <td>☐ (7) Transit and Ridesharing Incentives</td> <td>☐ (11) Telecommuting</td> </tr> <tr> <td>☐ (4) Bicycle/Pedestrian Facilities and Site Improvements</td> <td>☐ (8) Parking Supply and Pricing Management</td> <td>☐ (12) Other _____</td> </tr> </table>			☐ (1) Transit Service	☐ (5) Employer Support Measures	☐ (9) Tolls and Congestion Pricing	☐ (2) Carpool Programs	☐ (6) Preferential HOV Treatments	☐ (10) Variable Work Hours/Compressed Work Weeks	☐ (3) Vanpool Programs	☐ (7) Transit and Ridesharing Incentives	☐ (11) Telecommuting	☐ (4) Bicycle/Pedestrian Facilities and Site Improvements	☐ (8) Parking Supply and Pricing Management	☐ (12) Other _____
First Shift:	Start Time _____	End Time _____	Employees (#) _____																										
Second Shift:	Start Time _____	End Time _____	Employees (#) _____																										
Third Shift:	Start Time _____	End Time _____	Employees (#) _____																										
☐ (1) Transit Service	☐ (5) Employer Support Measures	☐ (9) Tolls and Congestion Pricing																											
☐ (2) Carpool Programs	☐ (6) Preferential HOV Treatments	☐ (10) Variable Work Hours/Compressed Work Weeks																											
☐ (3) Vanpool Programs	☐ (7) Transit and Ridesharing Incentives	☐ (11) Telecommuting																											
☐ (4) Bicycle/Pedestrian Facilities and Site Improvements	☐ (8) Parking Supply and Pricing Management	☐ (12) Other _____																											

Please Complete Form on Other Side

ite Institute of Transportation Engineers
Trip Generation Data Form (Part 2)

Summary of Driveway Volumes

(All = All Vehicles Counted, Including Trucks; Trucks = Heavy Duty Trucks and Buses)

	Average Weekday (M-F)						Saturday						Sunday					
	Enter		Exit		Total		Enter		Exit		Total		Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks
12-Hour Volume ☒ Hour Volume 7 AM - 7 PM	278	7	255	4	544	11												
A.M. Peak Hour of Adjacent Street Traffic (7 - 9) Time:																		
P.M. Peak Hour of Adjacent Street Traffic (4 - 6) Time:																		
A.M. Peak Hour Generator ² Time: 11 AM - 12 PM	25	0	31	0	56	0												
P.M. Peak Hour Generator ² Time: 1 PM - 2 PM	25	0	42	0	67	0												
Peak Hour Generator ³ Time (Weekend):																		

¹ Highest hourly volume between 7 a.m. and 9 a.m. (4 p.m. and 6 p.m.). Please specify the peak hour.

² Highest hourly volume during the a.m. or p.m. period. Please specify the peak hour.

³ Highest hourly volume during the entire day. Please specify the peak hour.

Please refer to the *Trip Generation User's Guide* for full definition of terms.

Hourly Driveway Volumes- Average Weekday (M-F)

A.M. Period	Enter		Exit		Total		Mid-Day Period	Enter		Exit		Total		P.M. Period	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks		All	Trucks	All	Trucks	All	Trucks		All	Trucks	All	Trucks	All	Trucks
6:00-7:00							11:00-12:00	16		11		27		3:00-4:00	26		26	1	52	1
6:15-7:15							11:15-12:15	22		14		36		3:15-4:15	25		33	1	58	1
6:30-7:30							11:30-12:30	23		19		42		3:30-4:30	25		31		56	
6:45-7:45							11:45-12:45	23	1	16		39	1	3:45-4:45	20		19		39	
7:00-8:00	8		5		13		12:00-1:00	25	1	15		40	1	4:00-5:00	21		19		40	
7:15-8:15	14		5		19		12:15-1:15	22	1	14		36	1	4:15-5:15	26		16		42	
7:30-8:30	13		6		19		12:30-1:30	22	1	7		29	1	4:30-5:30	25		17		42	
7:45-8:45	16		3		19		12:45-1:45	25		12	1	37	1	4:45-5:45	23		30		53	
8:00-9:00	18		9		27		1:00-2:00	30		25	1	55	1	5:00-6:00	26		35		61	

☒ Check if Part 3, 4 and/or additional information is attached.

Survey conducted by: Name: Ana Micano
 Organization: Cal Poly SLO ITE
 Address: 1 Grand Ave.
 City/State/Zip: San Luis Obispo, CA 93405
 Telephone #: (805) 206-5576 Fax #: N/A E-mail: amicano@calpoly.edu

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 Technical Projects Division
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 Telephone: +1 202-289-0222
 Fax: +1 202-289-7722
 ITE on the Web: www.ite.org



Institute of Transportation Engineers

Trip Generation Data Form (Part 3)**Name/Organization:** Cal Poly SLO ITE**City/State:** San Luis Obispo, CA**Telephone Number:** (805) 206-5576*Detailed Driveway Volumes: Attach this sheet to Parts 1 and 2 if you are providing additional information.***Day of the week:** Wednesday

(All = All Vehicles Counted, Including Trucks; Trucks = Heavy Duty Trucks and Buses)

A.M. Period	Enter		Exit		Total		P.M. Period	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks		All	Trucks	All	Trucks	All	Trucks
12:00-12:15							12:00-12:15	6		2		8	
12:15-12:30							12:15-12:30	3		4		7	
12:30-12:45							12:30-12:45	11		4		15	
12:45-1:00							12:45-1:00	5		7		12	
1:00-1:15							1:00-1:15	4		15		19	
1:15-1:30							1:15-1:30	6		9		15	
1:30-1:45							1:30-1:45	11		10		21	
1:45-2:00							1:45-2:00	4		8		12	
2:00-2:15							2:00-2:15	6		10		16	
2:15-2:30							2:15-2:30	5		6		11	
2:30-2:45							2:30-2:45	4		6		10	
2:45-3:00							2:45-3:00	7		7		14	
3:00-3:15							3:00-3:15	6	1	4		10	1
3:15-3:30							3:15-3:30	15	2	7	2	22	4
3:30-3:45							3:30-3:45	8	1	7	1	15	2
3:45-4:00							3:45-4:00	5		8		13	
4:00-4:15							4:00-4:15	6		7		13	
4:15-4:30							4:15-4:30	11		8		19	
4:30-4:45							4:30-4:45	9		6		15	
4:45-5:00							4:45-5:00	5		6		11	
5:00-5:15							5:00-5:15	7	1	4		11	1
5:15-5:30							5:15-5:30	8		5		13	
5:30-5:45							5:30-5:45	7		8		15	
5:45-6:00							5:45-6:00	5	1	6		11	1
6:00-6:15							6:00-6:15	3		7		10	
6:15-6:30							6:15-6:30	4		2		6	
6:30-6:45							6:30-6:45	3		7		10	
6:45-7:00							6:45-7:00	5		2		7	
7:00-7:15					0		7:00-7:15						
7:15-7:30	4				4		7:15-7:30						
7:30-7:45	3		5		8		7:30-7:45						
7:45-8:00	1				1		7:45-8:00						
8:00-8:15	6				6		8:00-8:15						
8:15-8:30	3		1		4		8:15-8:30						
8:30-8:45	6		2		8		8:30-8:45						
8:45-9:00	3		6		9		8:45-9:00						
9:00-9:15	4		2		6		9:00-9:15						
9:15-9:30	9		4		13		9:15-9:30						
9:30-9:45	7		7		14		9:30-9:45						
9:45-10:00	3	1	3		6	1	9:45-10:00						
10:00-10:15	6		1		7		10:00-10:15						
10:15-10:30	6		3		9		10:15-10:30						
10:30-10:45	7				7		10:30-10:45						
10:45-11:00	6		8	1	14	1	10:45-11:00						
11:00-11:15	11		14		25		11:00-11:15						
11:15-11:30	2		4		6		11:15-11:30						
11:30-11:45	6		7		13		11:30-11:45						
11:45-12:00	6		6		12		11:45-12:00						

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Trip Generation Data Form (Part 4)

Summary of Bicycle Volumes

	Average Weekday (M-F)			Saturday			Sunday		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
12-Hour Volume ☒ Hour Volume 7 AM - 7 PM	97	79	176						
A.M. Peak Hour of Adjacent ¹ Street Traffic (7 – 9) Time:									
P.M. Peak Hour of Adjacent ¹ Street Traffic (4 – 6) Time:									
A.M. Peak Hour Generator ² Time: 11 AM - 12 PM	14	14	28						
P.M. Peak Hour Generator ² Time: 3 PM - 4 PM	15	7	22						
Peak Hour Generator ³ Time (Weekend):									

¹. Highest hourly volume between 7 a.m. and 9 a.m. (4 p.m. and 6 p.m.) as defined in Trip Generation Data Form (Part 2). Please specify the peak hour.

². Highest hourly volume during the a.m. or p.m. period. Please specify the peak hour.

³. Highest hourly volume during the entire day. Please specify the peak hour. Please attach supplemental hourly volumes.

Please refer to the *Trip Generation User's Guide* for full definition of terms.

Summary of Pedestrian Volumes

	Average Weekday (M-F)			Saturday			Sunday		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
12-Hour Volume ☒ Hour Volume 7 AM - 7 PM	215	150	365						
A.M. Peak Hour of Adjacent, Street Traffic (7 – 9) Time:									
P.M. Peak Hour of Adjacent ¹ Street Traffic (4 – 6) Time:									
A.M. Peak Hour Generator ² Time: 9 AM - 10 AM	20	20	40						
P.M. Peak Hour Generator ² Time: 1 PM - 2 PM	33	11	44						
Peak Hour Generator ³ Time (Weekend):									

Survey conducted by: Name: Ana Micano
 Organization: Cal Poly SLO ITE
 Address: 1 Grand Ave.
 City/State/Zip: San Luis Obispo, CA 93405
 Telephone #: (805) 206-5576 Fax #: N/A E-mail: amicano@calpoly.edu

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Trip Generation Data Form (Part 1)

Land Use/Building Type: ¹ Public Park			ITE Land Use Code: 411		
Source: ITE Trip Generation Manual 11th Edition			Source No. (ITE use only):		
Name of Development: Santa Rosa Park			Day of the Week: Saturday		
City: San Luis Obispo	State/Province: CA	Zip/Postal Code: 90029	Day: 11	Month: February	Year: 2023
Country: USA			Metropolitan Area: San Luis Obispo-Paso Robles		

1. For fast-food land use, please specify if hamburger- or nonhamburger-based.

Location Within Area: ☐ (1) CBD ☐ (3) Suburban (Non-CBD) ☐ (5) Rural ☒ (2) Urban (Non-CBD) ☐ (4) Suburban CBD ☐ (6) Freeway Interchange Area (Rural) ☐ (7) Not Given				Detailed Description of Development:³ Public Park, located within an urban area, with ample amounts of amenities. Amenities include large grass fields, picnic areas, playground facilities, basketball courts, softball fields, a large skate park, roller sport field, and various paved walking paths throughout Santa Rosa Park.	
Independent Variable: (include data for as many as possible)²		Actual	Estimated	Actual	Estimated
_____ (1) Employees (#)	☐	☐	132	(9) Parking Spaces (% occupied: _____) ☒	☐
_____ (2) Persons (#)	☐	☐	_____	(10) Beds (% occupied: _____) ☐	☐
_____ (3) Total Units (#) (indicate unit: _____)	☐	☐	_____	(11) Seats (#) ☐	☐
_____ (4) Occupied Units (#) (indicate unit: _____)	☐	☐	_____	(12) Servicing Positions/Vehicle Fueling Positions ☐	☐
_____ (5) Gross Floor Area (gross sq. ft.) (% of development occupied _____)	☐	☐	_____	(13) Shopping Center % Out-parcels/pads ☐	☐
_____ (6) Net Rentable Area (sq. ft.)	☐	☐	_____	(14) A.M. Peak Hour Volume of Adjacent Street Traffic ☐	☐
_____ (7) Gross Leasable Area (sq. ft.) (% of development occupied _____)	☐	☐	_____	(15) P.M. Peak Hour Volume of Adjacent Street Traffic ☐	☐
9.98 (8) Total Acres (% developed: _____)	☐	☒	_____	(16) Other _____ ☐	☐
			_____	(17) Other _____ ☐	☐

2. Definitions for several independent variables can be found in the *Trip Generation, Second Edition, User's Guide Glossary*.

3. Please provide all pertinent information to describe the subject project, including the presence of bicycle/pedestrian facilities. To report bicycle/pedestrian volumes, please refer to Part 4 of this data form.

Other Data: Vehicle Occupancy (#): _____ A.M. _____ P.M. _____ 24-hour % Percent by Transit: _____ A.M. % _____ P.M. % _____ 24-hour % Percent by Carpool/Vanpool: _____ A.M. % _____ P.M. % _____ 24-hour % Employees by Shift: First Shift: Start Time _____ End Time _____ Employees (#) _____ Second Shift: Start Time _____ End Time _____ Employees (#) _____ Third Shift: Start Time _____ End Time _____ Employees (#) _____ Parking Cost on Site: Hourly _____ Daily _____			Transportation Demand Management (TDM) Information: At the time of this study, was there a TDM program (that may have impacted the trip generation characteristics of this site) underway? ☒ No ☐ Yes (If yes, please check appropriate box/boxes, describe the nature of the TDM program(s) and provide a source for any studies that may help quantify this impact. Attach additional sheets if necessary) ☐ (1) Transit Service ☐ (2) Carpool Programs ☐ (3) Vanpool Programs ☐ (4) Bicycle/Pedestrian Facilities and Site Improvements ☐ (5) Employer Support Measures ☐ (6) Preferential HOV Treatments ☐ (7) Transit and Ridesharing Incentives ☐ (8) Parking Supply and Pricing Management ☐ (9) Tolls and Congestion Pricing ☐ (10) Variable Work Hours/Compressed Work Weeks ☐ (11) Telecommuting ☐ (12) Other _____		
---	--	--	---	--	--

Please Complete Form on Other Side

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Trip Generation Data Form (Part 2)

Summary of Driveway Volumes

(All = All Vehicles Counted, Including Trucks; Trucks = Heavy Duty Trucks and Buses)

	Average Weekday (M-F)						Saturday						Sunday					
	Enter		Exit		Total		Enter		Exit		Total		Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks	All	Trucks
12-Hour Volume							199	7	191	3	390	10						
☒ Hour Volume 7 AM - 7 PM																		
A.M. Peak Hour of Adjacent Street Traffic (7 - 9) Time:																		
P.M. Peak Hour of Adjacent Street Traffic (4 - 6) Time:																		
A.M. Peak Hour Generator ² Time:																		
P.M. Peak Hour Generator ² Time:																		
Peak Hour Generator ³ Time (Weekend): 5 PM - 6 PM							22	0	28	0	50	0						

¹ Highest hourly volume between 7 a.m. and 9 a.m. (4 p.m. and 6 p.m.). Please specify the peak hour.

² Highest hourly volume during the a.m. or p.m. period. Please specify the peak hour.

³ Highest hourly volume during the entire day. Please specify the peak hour.

Please refer to the *Trip Generation User's Guide* for full definition of terms.

Hourly Driveway Volumes- Average Weekday (M-F)

A.M. Period	Enter		Exit		Total		Mid-Day Period	Enter		Exit		Total		P.M. Period	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks		All	Trucks	All	Trucks	All	Trucks		All	Trucks	All	Trucks	All	Trucks
6:00-7:00							11:00-12:00							3:00-4:00						
6:15-7:15							11:15-12:15							3:15-4:15						
6:30-7:30							11:30-12:30							3:30-4:30						
6:45-7:45							11:45-12:45							3:45-4:45						
7:00-8:00							12:00-1:00							4:00-5:00						
7:15-8:15							12:15-1:15							4:15-5:15						
7:30-8:30							12:30-1:30							4:30-5:30						
7:45-8:45							12:45-1:45							4:45-5:45						
8:00-9:00							1:00-2:00							5:00-6:00						

☒ Check if Part 3, 4 and/or additional information is attached.

Survey conducted by: Name: Ana Micano
 Organization: Cal Poly SLO ITE
 Address: 1 Grand Ave.
 City/State/Zip: San Luis Obispo, CA 93405
 Telephone #: (805) 206-5576 Fax #: N/A E-mail: amicano@calpoly.edu

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 Telephone: +1 202-289-0222
 Fax: +1 202-289-7722
 ITE on the Web: www.ite.org



Institute of Transportation Engineers

Trip Generation Data Form (Part 3)**Name/Organization:** Cal Poly SLO ITE**City/State:** San Luis Obispo, CA**Telephone Number:** (805) 206-5576*Detailed Driveway Volumes: Attach this sheet to Parts 1 and 2 if you are providing additional information.***Day of the week:** _____ (All = All Vehicles Counted, Including Trucks; Trucks = Heavy Duty Trucks and Buses)

A.M. Period	Enter		Exit		Total		P.M. Period	Enter		Exit		Total	
	All	Trucks	All	Trucks	All	Trucks		All	Trucks	All	Trucks	All	Trucks
12:00-12:15							12:00-12:15	4		3		7	
12:15-12:30							12:15-12:30	6		6		12	
12:30-12:45							12:30-12:45	3		7		10	
12:45-1:00							12:45-1:00	7		9		16	
1:00-1:15							1:00-1:15	1		2		3	
1:15-1:30							1:15-1:30	2		2		4	
1:30-1:45							1:30-1:45	3		4		7	
1:45-2:00							1:45-2:00	5		3		8	
2:00-2:15							2:00-2:15	6		1		7	
2:15-2:30							2:15-2:30	6		4		10	
2:30-2:45							2:30-2:45	4		1		5	
2:45-3:00							2:45-3:00	6		2		8	
3:00-3:15							3:00-3:15	1		4		5	
3:15-3:30							3:15-3:30	5		3		8	
3:30-3:45							3:30-3:45	3		8		11	
3:45-4:00							3:45-4:00	5		1		6	
4:00-4:15							4:00-4:15	10		2		12	
4:15-4:30							4:15-4:30	2		5		7	
4:30-4:45							4:30-4:45	3		4		7	
4:45-5:00							4:45-5:00	3		3		6	
5:00-5:15							5:00-5:15	1				1	
5:15-5:30							5:15-5:30	6		2		8	
5:30-5:45							5:30-5:45	9		13		22	
5:45-6:00							5:45-6:00	6		3		9	
6:00-6:15							6:00-6:15	2		6		8	
6:15-6:30							6:15-6:30			3		3	
6:30-6:45							6:30-6:45	2		1		3	
6:45-7:00							6:45-7:00	6		5		11	
7:00-7:15	2		1		3		7:00-7:15						
7:15-7:30			2		2		7:15-7:30						
7:30-7:45	4		2		6		7:30-7:45						
7:45-8:00			2		2		7:45-8:00						
8:00-8:15	3	2			3	2	8:00-8:15						
8:15-8:30	2		3	2	5	2	8:15-8:30						
8:30-8:45	7	1	1		8	1	8:30-8:45						
8:45-9:00	12	3	1		13	3	8:45-9:00						
9:00-9:15	5		1		6		9:00-9:15						
9:15-9:30	4		5		9		9:15-9:30						
9:30-9:45	2		4		6		9:30-9:45						
9:45-10:00	3		12		15		9:45-10:00						
10:00-10:15	3		3		6		10:00-10:15						
10:15-10:30	6		10		16		10:15-10:30						
10:30-10:45	4		5		9		10:30-10:45						
10:45-11:00	3		3		6		10:45-11:00						
11:00-11:15	4		3		7		11:00-11:15						
11:15-11:30	5	1	4		9	1	11:15-11:30						
11:30-11:45	8		13		21		11:30-11:45						
11:45-12:00	5		9	1	14	1	11:45-12:00						

ite Institute of Transportation Engineers
Trip Generation Data Form (Part 4)

Summary of Bicycle Volumes

	Average Weekday (M-F)			Saturday			Sunday		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
12-Hour Volume				26	28	54			
X Hour Volume 7 AM - 7 PM									
A.M. Peak Hour of Adjacent Street Traffic (7 – 9) Time:									
P.M. Peak Hour of Adjacent Street Traffic (4 – 6) Time:									
A.M. Peak Hour Generator ² Time:									
P.M. Peak Hour Generator ² Time:									
Peak Hour Generator ³ Time (Weekend): 8 AM - 9 AM				7	3	10			

¹. Highest hourly volume between 7 a.m. and 9 a.m. (4 p.m. and 6 p.m.) as defined in Trip Generation Data Form (Part 2). Please specify the peak hour.

². Highest hourly volume during the a.m. or p.m. period. Please specify the peak hour.

³. Highest hourly volume during the entire day. Please specify the peak hour. Please attach supplemental hourly volumes.

Please refer to the *Trip Generation User's Guide* for full definition of terms.

Summary of Pedestrian Volumes

	Average Weekday (M-F)			Saturday			Sunday		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
12-Hour Volume				125	72	197			
X Hour Volume 7 AM - 7 PM									
A.M. Peak Hour of Adjacent Street Traffic (7 – 9) Time:									
P.M. Peak Hour of Adjacent Street Traffic (4 – 6) Time:									
A.M. Peak Hour Generator ² Time:									
P.M. Peak Hour Generator ² Time:									
Peak Hour Generator ³ Time (Weekend): 2 PM - 3 PM				20	10	30			

Survey conducted by: Name: Ana Micano
 Organization: Cal Poly SLO ITE
 Address: 1 Grand Ave.
 City/State/Zip: San Luis Obispo, CA 93405
 Telephone #: (805) 206-5576 Fax #: N/A E-mail: amicano@calpoly.edu

Please return to: Institute of Transportation Engineers
 Technical Projects Division
 1099 14th Street, NW, Suite 300 West
 Washington, DC 20005-3438 USA
 Telephone: +1 202-289-0222
 Fax: +1 202-289-7722
 ITE on the Web: www.ite.org



Parking Demand Survey Form

Institute of Transportation Engineers

(fill in all highlighted cells - * are required data)

Land Use Code*	411
Name of Site	Santa Rosa Park
Brief Description of Site	Public Park
Transit*	Yes
Area*	SUB
TMP*	No
Parking Price*	\$ -
City	San Luis Obispo
State	CA
Country	USA
Daily Rate	\$
Hourly Rate	

Site Size*	9.98	Units	Acres	Occupancy*		Land Use
Site Size		Units		Occupancy		
Site Size		Units		Occupancy		
Site Size		Units		Occupancy		

Number of Parking Spaces Provided at Site 132

Highest Observed Parking Demand for the following hours of the day (hour beginning)*

Date	2/5/2023	2/8/2023	2/11/2023				
Day	Sunday	Wednesday	Saturday				
12 Mid							
1:00 AM							
2:00 AM							
3:00 AM							
4:00 AM							
5:00 AM							
6:00 AM							
7:00 AM	6	26	11				
8:00 AM	9	31	23				
9:00 AM	27	34	34				
10:00 AM	30	43	35				
11:00 AM	35	50	36				
12 Noon	40	43	19				
1:00 PM	40	52	9				
2:00 PM	29	43	19				
3:00 PM	26	33	18				
4:00 PM	25	38	22				
5:00 PM	30	38	23				
6:00 PM	31	36	17				
7:00 PM							
8:00 PM							
9:00 PM							
10:00 PM							
11:00 PM							

Person	Ana Micano	Organization	Cal Poly SLO ITE
Phone	(805) 206-5576		
Fax			
Email	amiciano@calpoly.edu		
Notes			

Enter data on the web at www.ite.org

Comments to: ite_staff@ite.org

IF not entered on web site, please mail to:

Institute of Transportation Engineers, 1627 Eye Street, NW Suite 600; Washington, DC 20006

* DON'T COUNT PASS-THROUGHS *

DO COUNT PEDS WALKING THRU

2023 Cal Poly ITE Data Collection Project - Trip Generation Tally

Site: Santa Rosa Park People:
 Date: 2/05/2023

Please tally up number of vehicles, bikes and pedestrians entering and exiting here. Fill out the ITE Trip Generation Data Form using by counting up the total number of tallies here.

	Time	Vehicles		Bikes		Pedestrians		Trucks		Notes
		Entering	Exiting	Entering	Exiting	Entering	Exiting	Entering	Exiting	
AM	7:00 - 7:15									skate boards hover board roller derby
	7:15 - 7:30									
	7:30 - 7:45									
	7:45 - 8:00									
	8:00 - 8:15									
	8:15 - 8:30									
	8:30 - 8:45									
	8:45 - 9:00									
	9:00 - 9:15									
	9:15 - 9:30									
	9:30 - 9:45									
	9:45 - 10:00									
	10:00 - 10:15									
	10:15 - 10:30									
	10:30 - 10:45									
PM	10:45 - 11:00									7am - 7pm Covers BWA of Trip Generation Truck parked waiting to deliver gas
	11:00 - 11:15									
	11:15 - 11:30									
	11:30 - 11:45									
	11:45 - 12:00									
	12:00 - 12:15									
	12:15 - 12:30									
	12:30 - 12:45									
	12:45 - 1:00									
	1:00 - 1:15									
	1:15 - 1:30									
	1:30 - 1:45									
	1:45 - 2:00									
	2:00 - 2:15									
	2:15 - 2:30									
	2:30 - 2:45									
	2:45 - 3:00									
	3:00 - 3:15									
	3:15 - 3:30									
	3:30 - 3:45									
	3:45 - 4:00									
	4:00 - 4:15									
	4:15 - 4:30									
	4:30 - 4:45									
	4:45 - 5:00									
	5:00 - 5:15									
	5:15 - 5:30									
	5:30 - 5:45									
	5:45 - 6:00									
	6:00 - 6:15									
	6:15 - 6:30									
	6:30 - 6:45									
	6:45 - 7:00									

DON'T COUNT PASSTHROUGHS
Vehicles

2023 Cal Poly ITE Data Collection Project - Trip Generation Tally

Site: Santa Rosa Park People:
Date: 2/7/2023

Please tally up number of vehicles, bikes and pedestrians entering and exiting here. Fill out the ITE Trip Generation Data Form using by counting up the total number of tallies here.

	Time	Vehicles		Bikes		Pedestrians		Trucks		Notes
		Entering	Exiting	Entering	Exiting	Entering	Exiting	Entering	Exiting	
AM	7:00 - 7:15									People parked and left park on foot motor bikes backhoe - 1 entering & exiting bike - 1 entering & exiting car - 1 parked car = skid pad kids are picked up / dropped off by parents Moped one wheel (900) 2 Might have walked to park 3.15 bus drop off - kids walked home Truck pulled to white
	7:15 - 7:30									
	7:30 - 7:45									
	7:45 - 8:00									
	8:00 - 8:15									
	8:15 - 8:30									
	8:30 - 8:45									
	8:45 - 9:00									
	9:00 - 9:15									
	9:15 - 9:30									
	9:30 - 9:45									
	9:45 - 10:00									
	10:00 - 10:15									
	10:15 - 10:30									
PM	10:30 - 10:45									
	10:45 - 11:00									
	11:00 - 11:15									
	11:15 - 11:30									
	11:30 - 11:45									
	11:45 - 12:00									
	12:00 - 12:15									
	12:15 - 12:30									
	12:30 - 12:45									
	12:45 - 1:00									
	1:00 - 1:15									
	1:15 - 1:30									
	1:30 - 1:45									
	1:45 - 2:00									
	2:00 - 2:15									
	2:15 - 2:30									
	2:30 - 2:45									
	2:45 - 3:00									
	3:00 - 3:15									
	3:15 - 3:30									
	3:30 - 3:45									
	3:45 - 4:00									
	4:00 - 4:15									
	4:15 - 4:30									
	4:30 - 4:45									
	4:45 - 5:00									
	5:00 - 5:15									
	5:15 - 5:30									
	5:30 - 5:45									
	5:45 - 6:00									
	6:00 - 6:15									
	6:15 - 6:30									
	6:30 - 6:45									
	6:45 - 7:00									

DON'T COUNT PASTHROUGHS

2023 Cal Poly ITE Data Collection Project - Trip Generation Tally

Site: Santa Rosa Park
Date: 2/11/2023

People:	

Please tally up number of vehicles, bikes and pedestrians entering and exiting here. Fill out the ITE Trip Generation Data Form using by counting up the total number of tallies here.

	Time	Vehicles		Bikes		Pedestrians		Trucks		Notes
		Entering	Exiting	Entering	Exiting	Entering	Exiting	Entering	Exiting	
AM	7:00 - 7:15									
	7:15 - 7:30									
	7:30 - 7:45									
	7:45 - 8:00									
	8:00 - 8:15									
	8:15 - 8:30									
	8:30 - 8:45									
	8:45 - 9:00									
	9:00 - 9:15									
	9:15 - 9:30									
	9:30 - 9:45									
	9:45 - 10:00									
	10:00 - 10:15									
	10:15 - 10:30									
10:30 - 10:45										
10:45 - 11:00										
11:00 - 11:15										
11:15 - 11:30										
11:30 - 11:45										
11:45 - 12:00										
PM	12:00 - 12:15									
	12:15 - 12:30									
	12:30 - 12:45									
	12:45 - 1:00									
	1:00 - 1:15									
	1:15 - 1:30									
	1:30 - 1:45									
	1:45 - 2:00									
	2:00 - 2:15									
	2:15 - 2:30									
	2:30 - 2:45									
	2:45 - 3:00									
	3:00 - 3:15									
	3:15 - 3:30									
	3:30 - 3:45									
	3:45 - 4:00									
	4:00 - 4:15									
	4:15 - 4:30									
	4:30 - 4:45									
	4:45 - 5:00									
	5:00 - 5:15									
	5:15 - 5:30									
	5:30 - 5:45									
	5:45 - 6:00									
6:00 - 6:15										
6:15 - 6:30										
6:30 - 6:45										
6:45 - 7:00										

Some people,
lots of people
entering, hard to
count
Started counting @ 9:50
*LOTS OF
CARS JUST
GOING BY

He
Started counting,
⑤ 7:00

Pickup/Drop at
shale @ 5

2023 Cal Poly ITE Data Collection Project - Parking Demand Tally

Site:

Santa Rosa Park

People:

Date:

2/05/2023

Please tally up number of vehicles, bikes and pedestrians entering and exiting here. Fill out the ITE Trip Generation Data Form using by counting up the total number of tallies here.

	Time	Parking Demand	Notes
AM	7:00 - 7:15	6	
	7:15 - 7:30	6	
	7:30 - 7:45	5	
	7:45 - 8:00	4	
	8:00 - 8:15	4	
	8:15 - 8:30	7	
	8:30 - 8:45	8	
	8:45 - 9:00	9	
	9:00 - 9:15		
	9:15 - 9:30	10	
	9:30 - 9:45	25	
	9:45 - 10:00	27	
	10:00 - 10:15	30	
	10:15 - 10:30	30	
	10:30 - 10:45	30	
	10:45 - 11:00	23	
PM	11:00 - 11:15	25	
	11:15 - 11:30	30	
	11:30 - 11:45	33	
	11:45 - 12:00	35	
	12:00 - 12:15	30	
	12:15 - 12:30	31	
	12:30 - 12:45	32	
	12:45 - 1:00	40	
	1:00 - 1:15	38	
	1:15 - 1:30	40	
	1:30 - 1:45	35	
	1:45 - 2:00	34	
	2:00 - 2:15	28	
	2:15 - 2:30	29	
	2:30 - 2:45	21	
	2:45 - 3:00	28	
	3:00 - 3:15	22	
	3:15 - 3:30	23	
	3:30 - 3:45	23	
	3:45 - 4:00	23	
	4:00 - 4:15	24	
	4:15 - 4:30	19	
	4:30 - 4:45	24	
	4:45 - 5:00	25	
	5:00 - 5:15	25	
	5:15 - 5:30	26	
	5:30 - 5:45	26	
	5:45 - 6:00	20	
	6:00 - 6:15	31	
	6:15 - 6:30	27	
	6:30 - 6:45	24	
	6:45 - 7:00	20	

* COUNT RV AS TWO SPOTS *
 use tally marks or #
 Oversize Vehicles / Trailers

2023 Cal Poly ITE Data Collection Project - Parking Demand Tally

Site: Santa Rosa Park People:
 Date: 2/8/2023

Please tally up number of vehicles, bikes and pedestrians entering and exiting here. Fill out the ITE Trip Generation Data Form using by counting up the total number of tallies here.

	Time	Parking Demand	Notes
AM	7:00 - 7:15	20	
	7:15 - 7:30	24	
	7:30 - 7:45	26	
	7:45 - 8:00	24	
	8:00 - 8:15	25	
	8:15 - 8:30	28	
	8:30 - 8:45	31	
	8:45 - 9:00	27	
	9:00 - 9:15	30	
	9:15 - 9:30	30	
	9:30 - 9:45	33	
	9:45 - 10:00	32	
	10:00 - 10:15	34	
	10:15 - 10:30	35	
	10:30 - 10:45	43	
	10:45 - 11:00	42	
	11:00 - 11:15	50	
PM	11:15 - 11:30	43	
	11:30 - 11:45	41	
	11:45 - 12:00	32	
	12:00 - 12:15	41	
	12:15 - 12:30	42	
	12:30 - 12:45	45	
	12:45 - 1:00	52	
	1:00 - 1:15	50	
	1:15 - 1:30	43	
	1:30 - 1:45	43	
	1:45 - 2:00	34	
	2:00 - 2:15	31	
	2:15 - 2:30	33	
	2:30 - 2:45	29	
	2:45 - 3:00	28	
	3:00 - 3:15	31	
	3:15 - 3:30	38	
	3:30 - 3:45	38	
	3:45 - 4:00	38	
	4:00 - 4:15	37	
	4:15 - 4:30	36	
	4:30 - 4:45	30	
	4:45 - 5:00	34	+6 acc. by large truck
	5:00 - 5:15	37	+6, ...
	5:15 - 5:30	36	+6, ...
	5:30 - 5:45	34	
	5:45 - 6:00	22	
	6:00 - 6:15	26	
	6:15 - 6:30	29	
	6:30 - 6:45	24	
	6:45 - 7:00	27	

COUNT RV/LARGE VEH/
TRAILERS AS 2

9 in side

* potential parking #s are
college students / from
neighboring businesses

+6 acc. by large truck

+6, ...

+6, ...

2023 Cal Poly ITE Data Collection Project - Parking Demand Tally

Site: Santa Rosa Park People:
 Date: 2/11/2023

Please tally up number of vehicles, bikes and pedestrians entering and exiting here. Fill out the ITE Trip Generation Data Form using by counting up the total number of tallies here.

	Time	Parking Demand	Notes
AM	7:00 - 7:15	10	
	7:15 - 7:30	9	
	7:30 - 7:45	11	
	7:45 - 8:00	9	
	8:00 - 8:15	9	
	8:15 - 8:30	8	
	8:30 - 8:45	10	
	8:45 - 9:00	23	
	9:00 - 9:15	25	
	9:15 - 9:30	30	
	9:30 - 9:45	34	
	9:45 - 10:00	32	
	10:00 - 10:15	26	
	10:15 - 10:30	26	
PM	10:30 - 10:45	27	
	10:45 - 11:00	25	
	11:00 - 11:15	31	
	11:15 - 11:30	36	
	11:30 - 11:45	28	
	11:45 - 12:00	16	
	12:00 - 12:15	19	
	12:15 - 12:30	12	
	12:30 - 12:45	12	
	12:45 - 1:00	13	
	1:00 - 1:15	9	
	1:15 - 1:30	9	
	1:30 - 1:45	9	
	1:45 - 2:00	9	
	2:00 - 2:15	16	
	2:15 - 2:30	13	
	2:30 - 2:45	17	
	2:45 - 3:00	19	
	3:00 - 3:15	16	
	3:15 - 3:30	17	
	3:30 - 3:45	13	
	3:45 - 4:00	18	
	4:00 - 4:15	22	
	4:15 - 4:30	19	
	4:30 - 4:45	16	
	4:45 - 5:00	17	
	5:00 - 5:15	19	
	5:15 - 5:30	23	
	5:30 - 5:45	20	
	5:45 - 6:00	22	
	6:00 - 6:15	110	
	6:15 - 6:30	15	
	6:30 - 6:45	160	
	6:45 - 7:00	17	

COUNT RVs / TRAILERS /
 LARGE VEH AS 2

← parked bus / 2 spots
 * lots of cars cutting
 through parking lot
 ← bus left

started
 raining

rain!

2024 Existing Peak Hour Intersection Level of Service

HCM 6th Signalized Intersection Summary

1: Bothell Way NE (SR 522) & NE 170th St

08/27/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	22	52	7	18	19	59	1694	4	21	1316	16
Future Volume (veh/h)	82	22	52	7	18	19	59	1694	4	21	1316	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	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1723	1723	1723	1736	1736	1736	1723	1723	1723
Adj Flow Rate, veh/h	85	23	54	7	19	20	61	1746	4	22	1357	16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	2	2	2
Cap, veh/h	109	25	324	26	59	46	76	2160	942	32	2056	916
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.05	0.65	0.65	0.04	1.00	1.00
Sat Flow, veh/h	314	112	1483	0	272	209	1654	3299	1438	1641	3273	1459
Grp Volume(v), veh/h	108	0	54	46	0	0	61	1746	4	22	1357	16
Grp Sat Flow(s),veh/h/ln	426	0	1483	480	0	0	1654	1650	1438	1641	1637	1459
Q Serve(g_s), s	0.0	0.0	4.7	0.0	0.0	0.0	5.8	62.1	0.2	2.1	0.0	0.0
Cycle Q Clear(g_c), s	35.0	0.0	4.7	35.0	0.0	0.0	5.8	62.1	0.2	2.1	0.0	0.0
Prop In Lane	0.79		1.00	0.15		0.43	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	133	0	324	131	0	0	76	2160	942	32	2056	916
V/C Ratio(X)	0.81	0.00	0.17	0.35	0.00	0.00	0.80	0.81	0.00	0.69	0.66	0.02
Avail Cap(c_a), veh/h	133	0	324	131	0	0	202	2160	942	149	2056	916
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.2	0.0	50.7	52.1	0.0	0.0	75.6	20.2	9.6	76.4	0.0	0.0
Incr Delay (d2), s/veh	29.9	0.0	0.2	1.6	0.0	0.0	17.0	3.4	0.0	23.0	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.5	0.0	3.3	2.8	0.0	0.0	5.1	31.2	0.1	1.9	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	94.0	0.0	50.9	53.7	0.0	0.0	92.5	23.6	9.6	99.4	1.7	0.0
LnGrp LOS	F	A	D	D	A	A	F	C	A	F	A	A
Approach Vol, veh/h		162			46			1811			1395	
Approach Delay, s/veh		79.7			53.7			25.9			3.2	
Approach LOS		E			D			C			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	110.9		40.5	12.9	106.6		40.5				
Change Period (Y+Rc), s	5.5	6.1		* 5.5	5.5	6.1		5.5				
Max Green Setting (Gmax), s	14.5	93.9		* 35	19.5	88.9		34.5				
Max Q Clear Time (g_c+I1), s	4.1	64.1		37.0	7.8	2.0		37.0				
Green Ext Time (p_c), s	0.0	16.7		0.0	0.1	14.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			19.6									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th TWSC
2: Bothell Way NE (SR 522) & Middle Dwy

08/27/2024

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	86	0	1796	1266	81
Future Vol, veh/h	0	86	0	1796	1266	81
Conflicting Peds, #/hr	0	2	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	100	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	88	0	1833	1292	83

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 650	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.92	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.31	- -	- -
Pot Cap-1 Maneuver	0 414	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 412	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	16.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 412	- -	- -
HCM Lane V/C Ratio	- 0.213	- -	- -
HCM Control Delay (s)	- 16.1	- -	- -
HCM Lane LOS	- C	- -	- -
HCM 95th %tile Q(veh)	- 0.8	- -	- -

HCM 6th Signalized Intersection Summary

3: Bothell Way NE (SR 522) & Ballinger Way (SR 104)/Ballinger Way

08/27/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	647	16	162	5	6	3	216	1550	5	15	1200	636
Future Volume (veh/h)	647	16	162	5	6	3	216	1550	5	15	1200	636
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		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1736	1736	1736	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	665	0	0	5	6	3	218	1566	5	15	1212	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	649	0		9	10	5	236	2084	900	25	1663	
Arrive On Green	0.20	0.00	0.00	0.01	0.01	0.01	0.29	1.00	1.00	0.02	0.50	0.00
Sat Flow, veh/h	3307	0	1471	592	710	355	1654	3299	1425	1654	3299	1471
Grp Volume(v), veh/h	665	0	0	14	0	0	218	1566	5	15	1212	0
Grp Sat Flow(s),veh/h/ln	1654	0	1471	1657	0	0	1654	1650	1425	1654	1650	1471
Q Serve(g_s), s	31.4	0.0	0.0	1.3	0.0	0.0	20.5	0.0	0.0	1.4	46.1	0.0
Cycle Q Clear(g_c), s	31.4	0.0	0.0	1.3	0.0	0.0	20.5	0.0	0.0	1.4	46.1	0.0
Prop In Lane	1.00		1.00	0.36		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	649	0		24	0	0	236	2084	900	25	1663	
V/C Ratio(X)	1.02	0.00		0.58	0.00	0.00	0.92	0.75	0.01	0.60	0.73	
Avail Cap(c_a), veh/h	649	0		150	0	0	305	2084	900	150	1663	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.54	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	64.3	0.0	0.0	78.4	0.0	0.0	56.4	0.0	0.0	78.3	31.1	0.0
Incr Delay (d2), s/veh	32.4	0.0	0.0	20.5	0.0	0.0	28.3	2.6	0.0	20.5	2.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.3	0.0	0.0	1.3	0.0	0.0	14.3	1.3	0.0	1.4	25.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.7	0.0	0.0	98.9	0.0	0.0	84.7	2.6	0.0	98.8	33.9	0.0
LnGrp LOS	F	A		F	A	A	F	A	A	F	C	
Approach Vol, veh/h	665			14			1789			1227		
Approach Delay, s/veh	96.7			98.9			12.6			34.7		
Approach LOS	F			F			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	107.3		37.0	28.3	86.9		7.8				
Change Period (Y+Rc), s	5.5	6.2		5.6	5.5	6.2		5.5				
Max Green Setting (Gmax), s	14.5	76.8		31.4	29.5	61.8		14.5				
Max Q Clear Time (g_c+I1), s	3.4	2.0		33.4	22.5	48.1		3.3				
Green Ext Time (p_c), s	0.0	19.1		0.0	0.3	6.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay 35.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

4: NE 175th St & Ballinger Way (SR 104)

08/27/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	725	123	67	786	33	189	58	87	31	57	16
Future Volume (veh/h)	16	725	123	67	786	33	189	58	87	31	57	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		0.98	0.99		0.99	1.00		0.99
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	1750	1750	1750	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	16	740	126	68	802	34	193	59	89	32	58	16
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	251	889	151	219	1019	43	316	74	381	154	341	94
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	668	1453	247	649	1665	71	931	285	1460	1249	1306	360
Grp Volume(v), veh/h	16	0	866	68	0	836	252	0	89	32	0	74
Grp Sat Flow(s),veh/h/ln	668	0	1700	649	0	1736	1215	0	1460	1249	0	1666
Q Serve(g_s), s	1.6	0.0	34.9	8.0	0.0	31.2	14.7	0.0	4.2	2.1	0.0	3.0
Cycle Q Clear(g_c), s	32.8	0.0	34.9	42.9	0.0	31.2	17.7	0.0	4.2	19.9	0.0	3.0
Prop In Lane	1.00		0.15	1.00		0.04	0.77		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	251	0	1041	219	0	1063	390	0	381	154	0	435
V/C Ratio(X)	0.06	0.00	0.83	0.31	0.00	0.79	0.65	0.00	0.23	0.21	0.00	0.17
Avail Cap(c_a), veh/h	416	0	1461	380	0	1492	582	0	581	325	0	663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	13.3	30.2	0.0	12.6	31.6	0.0	25.2	39.6	0.0	24.8
Incr Delay (d2), s/veh	0.1	0.0	3.0	0.8	0.0	1.9	1.8	0.0	0.3	0.7	0.0	0.2
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	0.5	0.0	18.0	2.3	0.0	16.4	8.8	0.0	2.6	1.2	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	0.0	16.3	31.0	0.0	14.5	33.4	0.0	25.5	40.2	0.0	25.0
LnGrp LOS	C	A	B	C	A	B	C	A	C	D	A	C
Approach Vol, veh/h	882			904			341			106		
Approach Delay, s/veh	16.4			15.7			31.4			29.6		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	28.1			58.6			28.1			58.6		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	34.5			74.5			34.5			74.5		
Max Q Clear Time (g_c+I1), s	19.7			36.9			21.9			44.9		
Green Ext Time (p_c), s	1.6			8.6			0.3			8.2		

Intersection Summary

HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

HCM 6th TWSC
5: Beach Dr & Ballinger Way

08/27/2024

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	13	20	7	0	0	0	13	0	0	0	0	13
Future Vol, veh/h	13	20	7	0	0	0	13	0	0	0	0	13
Conflicting Peds, #/hr	6	0	18	18	0	0	24	0	6	6	0	6
Sign Control	Free	Free	Free	Yield	Yield	Yield	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	1080	1479	68	-	-	0	-	-	0
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	69	69	69	69	69	69	69	69	69
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	19	29	10	0	0	0	19	0	0	0	0	19
Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	6	0	0				124	96	58	84	101	30
Stage 1	-	-	-				90	90	-	6	6	-
Stage 2	-	-	-				34	6	-	78	95	-
Critical Hdwy	4.1	-	-				7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-				6.1	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-				-	-	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-				3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1628	-	-				855	798	1014	908	793	1050
Stage 1	-	-	-				922	824	-	-	-	-
Stage 2	-	-	-				-	-	-	936	820	-
Platoon blocked, %		-	-									
Mov Cap-1 Maneuver	1619	-	-				799	770	997	894	765	1020
Mov Cap-2 Maneuver	-	-	-				799	770	-	894	765	-
Stage 1	-	-	-				895	800	-	-	-	-
Stage 2	-	-	-				-	-	-	925	796	-
Approach	EB			NB			SB					
HCM Control Delay, s	2.4			9.6			8.6					
HCM LOS				A			A					
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1							
Capacity (veh/h)	799	1619	-	-	1020							
HCM Lane V/C Ratio	0.024	0.012	-	-	0.018							
HCM Control Delay (s)	9.6	7.2	0	-	8.6							
HCM Lane LOS	A	A	A	-	A							
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1							

Intersection

Int Delay, s/veh 0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	12	0	0	11
Future Vol, veh/h	0	0	12	0	0	11
Conflicting Peds, #/hr	6	0	0	1	1	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	48	48	48	48	48	48
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	25	0	0	23

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	55	26	0
Stage 1	26	-	-
Stage 2	29	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	958	1056	-
Stage 1	1002	-	-
Stage 2	999	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	951	1055	-
Mov Cap-2 Maneuver	951	-	-
Stage 1	1001	-	-
Stage 2	993	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1599
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0

HCM 6th Signalized Intersection Summary

1: Bothell Way NE (SR 522) & NE 170th St

08/27/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	10	60	7	5	23	81	1191	3	20	1181	24
Future Volume (veh/h)	84	10	60	7	5	23	81	1191	3	20	1181	24
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		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1750	1750	1723	1723	1723	1736	1736	1736	1723	1723	1723
Adj Flow Rate, veh/h	87	10	62	7	5	24	84	1228	3	21	1218	25
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	2	2	2
Cap, veh/h	162	15	304	41	37	84	105	2097	904	34	1942	864
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.06	0.64	0.64	0.02	0.59	0.59
Sat Flow, veh/h	511	75	1483	26	179	411	1654	3299	1422	1641	3273	1456
Grp Volume(v), veh/h	97	0	62	36	0	0	84	1228	3	21	1218	25
Grp Sat Flow(s),veh/h/ln	586	0	1483	617	0	0	1654	1650	1422	1641	1637	1456
Q Serve(g_s), s	0.0	0.0	4.2	0.4	0.0	0.0	6.0	25.9	0.1	1.5	28.9	0.9
Cycle Q Clear(g_c), s	22.3	0.0	4.2	22.7	0.0	0.0	6.0	25.9	0.1	1.5	28.9	0.9
Prop In Lane	0.90		1.00	0.19		0.67	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	177	0	304	162	0	0	105	2097	904	34	1942	864
V/C Ratio(X)	0.55	0.00	0.20	0.22	0.00	0.00	0.80	0.59	0.00	0.61	0.63	0.03
Avail Cap(c_a), veh/h	301	0	433	289	0	0	200	2097	904	198	1942	864
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.5	0.0	39.6	39.8	0.0	0.0	55.5	12.7	8.0	58.3	15.8	10.1
Incr Delay (d2), s/veh	2.6	0.0	0.3	0.7	0.0	0.0	13.1	1.2	0.0	16.2	1.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.3	0.0	2.8	1.6	0.0	0.0	5.1	13.9	0.1	1.4	15.6	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.2	0.0	39.9	40.4	0.0	0.0	68.6	13.9	8.0	74.5	17.3	10.2
LnGrp LOS	D	A	D	D	A	A	E	B	A	E	B	B
Approach Vol, veh/h	159			36			1315			1264		
Approach Delay, s/veh	45.6			40.4			17.4			18.1		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	82.3		29.7	13.1	77.2		29.7				
Change Period (Y+Rc), s	5.5	6.1		5.0	5.5	6.1		5.0				
Max Green Setting (Gmax), s	14.5	53.9		35.0	14.5	53.9		35.0				
Max Q Clear Time (g_c+I1), s	3.5	27.9		24.3	8.0	30.9		24.7				
Green Ext Time (p_c), s	0.0	9.7		0.5	0.1	9.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	19.6											
HCM 6th LOS	B											

HCM 6th TWSC
2: Bothell Way NE (SR 522) & Middle Dwy

08/27/2024

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	47	0	1289	1226	68
Future Vol, veh/h	0	47	0	1289	1226	68
Conflicting Peds, #/hr	0	2	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	100	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	0	49	0	1357	1291	72

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 650	- 0	- 0
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	0 417	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 415	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	14.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 415	- -	- -
HCM Lane V/C Ratio	- 0.119	- -	- -
HCM Control Delay (s)	- 14.8	- -	- -
HCM Lane LOS	- B	- -	- -
HCM 95th %tile Q(veh)	- 0.4	- -	- -

HCM 6th Signalized Intersection Summary

3: Bothell Way NE (SR 522) & Ballinger Way (SR 104)/Ballinger Way

08/27/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	520	16	157	10	7	6	160	1120	10	10	1127	485
Future Volume (veh/h)	520	16	157	10	7	6	160	1120	10	10	1127	485
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		0.94	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	559	0	0	11	7	6	168	1179	11	11	1186	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	720	0		17	11	9	195	1841	774	21	1494	
Arrive On Green	0.22	0.00	0.00	0.02	0.02	0.02	0.08	0.37	0.37	0.01	0.45	0.00
Sat Flow, veh/h	3333	0	1483	751	478	410	1654	3299	1387	1654	3299	1471
Grp Volume(v), veh/h	559	0	0	24	0	0	168	1179	11	11	1186	0
Grp Sat Flow(s),veh/h/ln	1667	0	1483	1639	0	0	1654	1650	1387	1654	1650	1471
Q Serve(g_s), s	19.0	0.0	0.0	1.7	0.0	0.0	12.0	35.3	0.6	0.8	36.9	0.0
Cycle Q Clear(g_c), s	19.0	0.0	0.0	1.7	0.0	0.0	12.0	35.3	0.6	0.8	36.9	0.0
Prop In Lane	1.00		1.00	0.46		0.25	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	720	0		38	0	0	195	1841	774	21	1494	
V/C Ratio(X)	0.78	0.00		0.64	0.00	0.00	0.86	0.64	0.01	0.52	0.79	
Avail Cap(c_a), veh/h	872	0		157	0	0	269	1841	774	131	1494	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.3	0.0	0.0	58.1	0.0	0.0	54.3	27.6	16.8	58.9	28.1	0.0
Incr Delay (d2), s/veh	2.7	0.0	0.0	16.6	0.0	0.0	18.1	1.7	0.0	18.4	4.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.1	0.0	0.0	1.6	0.0	0.0	10.1	21.2	0.3	0.8	21.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.0	0.0	0.0	74.7	0.0	0.0	72.3	29.4	16.8	77.2	32.5	0.0
LnGrp LOS	D	A		E	A	A	E	C	B	E	C	
Approach Vol, veh/h	559			24			1358			1197		
Approach Delay, s/veh	47.0			74.7			34.6			32.9		
Approach LOS	D			E			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	73.2		31.5	19.7	60.5		8.3				
Change Period (Y+Rc), s	5.5	6.2		5.6	5.5	6.2		5.5				
Max Green Setting (Gmax), s	9.5	44.8		31.4	19.5	34.8		11.5				
Max Q Clear Time (g_c+I1), s	2.8	37.3		21.0	14.0	38.9		3.7				
Green Ext Time (p_c), s	0.0	4.4		1.6	0.2	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 36.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

4: NE 175th St & Ballinger Way (SR 104)

08/27/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	575	82	84	540	13	103	24	86	32	23	9
Future Volume (veh/h)	9	575	82	84	540	13	103	24	86	32	23	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	0.98		0.97	0.99		0.95
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	1736	1736	1736	1750	1750	1750	1750	1750	1750	1723	1723	1723
Adj Flow Rate, veh/h	9	605	86	88	568	14	108	25	91	34	24	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	0	0	0	0	0	0	2	2	2
Cap, veh/h	456	837	119	367	961	24	342	63	264	285	216	81
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	839	1481	210	764	1699	42	1052	344	1437	1265	1175	441
Grp Volume(v), veh/h	9	0	691	88	0	582	133	0	91	34	0	33
Grp Sat Flow(s),veh/h/ln	839	0	1691	764	0	1741	1396	0	1437	1265	0	1615
Q Serve(g_s), s	0.3	0.0	13.1	4.2	0.0	9.6	3.1	0.0	2.4	1.1	0.0	0.7
Cycle Q Clear(g_c), s	9.9	0.0	13.1	17.3	0.0	9.6	3.9	0.0	2.4	5.0	0.0	0.7
Prop In Lane	1.00		0.12	1.00		0.02	0.81		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	456	0	956	367	0	984	405	0	264	285	0	296
V/C Ratio(X)	0.02	0.00	0.72	0.24	0.00	0.59	0.33	0.00	0.35	0.12	0.00	0.11
Avail Cap(c_a), veh/h	1410	0	2879	1235	0	2964	1269	0	1133	1050	0	1273
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.4	0.0	7.0	13.4	0.0	6.2	16.2	0.0	15.6	18.4	0.0	14.9
Incr Delay (d2), s/veh	0.0	0.0	1.1	0.3	0.0	0.6	0.5	0.0	0.8	0.2	0.0	0.2
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/ln0.1	0.0	0.0	5.6	1.1	0.0	4.1	2.0	0.0	1.4	0.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.5	0.0	8.0	13.7	0.0	6.8	16.7	0.0	16.3	18.6	0.0	15.1
LnGrp LOS	A	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h	700			670			224			67		
Approach Delay, s/veh	8.1			7.7			16.5			16.9		
Approach LOS	A			A			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	13.5			30.2			13.5			30.2		
Change Period (Y+Rc), s	5.5			5.5			5.5			5.5		
Max Green Setting (Gmax), s	34.5			74.5			34.5			74.5		
Max Q Clear Time (g_c+I1), s	5.9			15.1			7.0			19.3		
Green Ext Time (p_c), s	1.1			6.1			0.2			5.4		

Intersection Summary

HCM 6th Ctrl Delay	9.4
HCM 6th LOS	A

HCM 6th TWSC
5: Beach Dr & Ballinger Way

08/27/2024

Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	13	5	0	0	0	8	0	0	0	0	16
Future Vol, veh/h	17	13	5	0	0	0	8	0	0	0	0	16
Conflicting Peds, #/hr	3	0	17	23	0	9	17	0	7	9	0	3
Sign Control	Free	Free	Free	Yield	Yield	Yield	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	1080	1479	68	-	-	0	-	-	0
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	25	19	7	0	0	0	12	0	0	0	0	24

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	3	0	0		119	93	49	85	96
Stage 1	-	-	-		90	90	-	3	3
Stage 2	-	-	-		29	3	-	82	93
Critical Hdwy	4.1	-	-		7.1	6.5	6.2	7.1	6.5
Critical Hdwy Stg 1	-	-	-		6.1	5.5	-	-	-
Critical Hdwy Stg 2	-	-	-		-	-	-	6.1	5.5
Follow-up Hdwy	2.2	-	-		3.5	4	3.3	3.5	4
Pot Cap-1 Maneuver	1632	-	-		861	801	1025	906	798
Stage 1	-	-	-		922	824	-	-	-
Stage 2	-	-	-		-	-	-	931	822
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	1627	-	-		804	773	1008	892	770
Mov Cap-2 Maneuver	-	-	-		804	773	-	892	770
Stage 1	-	-	-		892	798	-	-	-
Stage 2	-	-	-		-	-	-	916	796

Approach	EB	NB	SB
HCM Control Delay, s	3.5	9.5	8.5
HCM LOS		A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	804	1627	-	-	1044
HCM Lane V/C Ratio	0.015	0.016	-	-	0.023
HCM Control Delay (s)	9.5	7.2	0	-	8.5
HCM Lane LOS	A	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0.1

Intersection

Int Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	12	1	0	10
Future Vol, veh/h	3	0	12	1	0	10
Conflicting Peds, #/hr	0	0	0	0	0	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	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	0	13	1	0	11

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	25	14	0
Stage 1	14	-	-
Stage 2	11	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	996	1072	-
Stage 1	1014	-	-
Stage 2	1017	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	996	1072	-
Mov Cap-2 Maneuver	996	-	-
Stage 1	1014	-	-
Stage 2	1017	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	996	1617
HCM Lane V/C Ratio	-	-	0.003	-
HCM Control Delay (s)	-	-	8.6	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

2027 Peak Hour Intersection Level of Service without the Project

HCM 6th Signalized Intersection Summary

1: Bothell Way NE (SR 522) & NE 170th St

09/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	22	53	7	18	19	60	1720	4	21	1336	16
Future Volume (veh/h)	83	22	53	7	18	19	60	1720	4	21	1336	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	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1750	1750	1723	1723	1723	1736	1736	1736	1723	1723	1723
Adj Flow Rate, veh/h	86	23	55	7	19	20	62	1773	4	22	1377	16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	2	2	2
Cap, veh/h	109	24	324	26	59	46	78	2160	942	32	2054	915
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.05	0.65	0.65	0.04	1.00	1.00
Sat Flow, veh/h	314	111	1483	0	272	209	1654	3299	1438	1641	3273	1459
Grp Volume(v), veh/h	109	0	55	46	0	0	62	1773	4	22	1377	16
Grp Sat Flow(s),veh/h/ln	425	0	1483	480	0	0	1654	1650	1438	1641	1637	1459
Q Serve(g_s), s	0.0	0.0	4.8	0.0	0.0	0.0	5.9	64.2	0.2	2.1	0.0	0.0
Cycle Q Clear(g_c), s	35.0	0.0	4.8	35.0	0.0	0.0	5.9	64.2	0.2	2.1	0.0	0.0
Prop In Lane	0.79		1.00	0.15		0.43	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	133	0	324	131	0	0	78	2160	942	32	2054	915
V/C Ratio(X)	0.82	0.00	0.17	0.35	0.00	0.00	0.80	0.82	0.00	0.69	0.67	0.02
Avail Cap(c_a), veh/h	133	0	324	131	0	0	202	2160	942	149	2054	915
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.4	0.0	50.7	52.1	0.0	0.0	75.5	20.6	9.6	76.4	0.0	0.0
Incr Delay (d2), s/veh	31.4	0.0	0.2	1.6	0.0	0.0	16.8	3.6	0.0	23.0	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.6	0.0	3.3	2.8	0.0	0.0	5.2	32.2	0.1	1.9	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.8	0.0	51.0	53.7	0.0	0.0	92.3	24.2	9.6	99.4	1.8	0.0
LnGrp LOS	F	A	D	D	A	A	F	C	A	F	A	A
Approach Vol, veh/h	164			46			1839			1415		
Approach Delay, s/veh	80.8			53.7			26.5			3.3		
Approach LOS	F			D			C			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	110.9		40.5	13.0	106.5		40.5				
Change Period (Y+Rc), s	5.5	6.1		* 5.5	5.5	6.1		5.5				
Max Green Setting (Gmax), s	14.5	93.9		* 35	19.5	88.9		34.5				
Max Q Clear Time (g_c+I1), s	4.1	66.2		37.0	7.9	2.0		37.0				
Green Ext Time (p_c), s	0.0	16.3		0.0	0.1	15.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	19.9											
HCM 6th LOS	B											
Notes												

HCM 6th TWSC
2: Bothell Way NE (SR 522) & Middle Dwy

09/06/2024

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	87	0	1823	1285	82
Future Vol, veh/h	0	87	0	1823	1285	82
Conflicting Peds, #/hr	0	2	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	100	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	89	0	1860	1311	84

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 660	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.92	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.31	- -	- -
Pot Cap-1 Maneuver	0 408	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 406	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

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

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 406	- -	- -
HCM Lane V/C Ratio	- 0.219	- -	- -
HCM Control Delay (s)	- 16.3	- -	- -
HCM Lane LOS	- C	- -	- -
HCM 95th %tile Q(veh)	- 0.8	- -	- -

HCM 6th Signalized Intersection Summary

3: Bothell Way NE (SR 522) & Ballinger Way (SR 104)/Ballinger Way

09/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	657	16	164	5	6	3	219	1573	5	15	1218	646
Future Volume (veh/h)	657	16	164	5	6	3	219	1573	5	15	1218	646
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		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1736	1736	1736	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	675	0	0	5	6	3	221	1589	5	15	1230	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	649	0		9	10	5	239	2084	900	25	1658	
Arrive On Green	0.20	0.00	0.00	0.01	0.01	0.01	0.29	1.00	1.00	0.02	0.50	0.00
Sat Flow, veh/h	3307	0	1471	592	710	355	1654	3299	1425	1654	3299	1471
Grp Volume(v), veh/h	675	0	0	14	0	0	221	1589	5	15	1230	0
Grp Sat Flow(s),veh/h/ln	1654	0	1471	1657	0	0	1654	1650	1425	1654	1650	1471
Q Serve(g_s), s	31.4	0.0	0.0	1.3	0.0	0.0	20.8	0.0	0.0	1.4	47.3	0.0
Cycle Q Clear(g_c), s	31.4	0.0	0.0	1.3	0.0	0.0	20.8	0.0	0.0	1.4	47.3	0.0
Prop In Lane	1.00		1.00	0.36		0.21	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	649	0		24	0	0	239	2084	900	25	1658	
V/C Ratio(X)	1.04	0.00		0.58	0.00	0.00	0.93	0.76	0.01	0.60	0.74	
Avail Cap(c_a), veh/h	649	0		150	0	0	305	2084	900	150	1658	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.53	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	64.3	0.0	0.0	78.4	0.0	0.0	56.1	0.0	0.0	78.3	31.6	0.0
Incr Delay (d2), s/veh	36.7	0.0	0.0	20.5	0.0	0.0	28.8	2.7	0.0	20.5	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.9	0.0	0.0	1.3	0.0	0.0	14.5	1.4	0.0	1.4	26.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	101.0	0.0	0.0	98.9	0.0	0.0	84.9	2.7	0.0	98.8	34.6	0.0
LnGrp LOS	F	A		F	A	A	F	A	A	F	C	
Approach Vol, veh/h	675			14			1815			1245		
Approach Delay, s/veh	101.0			98.9			12.7			35.4		
Approach LOS	F			F			B			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	107.3		37.0	28.6	86.6		7.8				
Change Period (Y+Rc), s	5.5	6.2		5.6	5.5	6.2		5.5				
Max Green Setting (Gmax), s	14.5	76.8		31.4	29.5	61.8		14.5				
Max Q Clear Time (g_c+I1), s	3.4	2.0		33.4	22.8	49.3		3.3				
Green Ext Time (p_c), s	0.0	19.6		0.0	0.3	6.6		0.0				

Intersection Summary

HCM 6th Ctrl Delay 36.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

4: NE 175th St & Ballinger Way (SR 104)

09/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	736	125	68	798	33	192	59	88	31	58	16
Future Volume (veh/h)	16	736	125	68	798	33	192	59	88	31	58	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		0.98	0.99		0.99	1.00		0.99
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	1750	1750	1750	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	16	751	128	69	814	34	196	60	90	32	59	16
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	245	896	153	212	1028	43	313	74	382	146	343	93
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	660	1453	248	641	1666	70	928	284	1460	1247	1311	356
Grp Volume(v), veh/h	16	0	879	69	0	848	256	0	90	32	0	75
Grp Sat Flow(s),veh/h/ln	660	0	1700	641	0	1736	1212	0	1460	1247	0	1667
Q Serve(g_s), s	1.7	0.0	37.1	8.7	0.0	33.1	15.7	0.0	4.4	2.3	0.0	3.1
Cycle Q Clear(g_c), s	34.8	0.0	37.1	45.7	0.0	33.1	18.8	0.0	4.4	21.1	0.0	3.1
Prop In Lane	1.00		0.15	1.00		0.04	0.77		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	245	0	1049	212	0	1071	387	0	382	146	0	436
V/C Ratio(X)	0.07	0.00	0.84	0.32	0.00	0.79	0.66	0.00	0.24	0.22	0.00	0.17
Avail Cap(c_a), veh/h	382	0	1400	345	0	1429	555	0	557	296	0	635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	0.0	13.7	31.9	0.0	13.0	33.1	0.0	26.3	41.6	0.0	25.8
Incr Delay (d2), s/veh	0.1	0.0	3.5	0.9	0.0	2.3	1.9	0.0	0.3	0.7	0.0	0.2
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	0.5	0.0	19.3	2.5	0.0	17.5	9.3	0.0	2.8	1.3	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	0.0	17.3	32.7	0.0	15.2	35.1	0.0	26.6	42.4	0.0	26.0
LnGrp LOS	C	A	B	C	A	B	D	A	C	D	A	C
Approach Vol, veh/h	895		917			346			107			
Approach Delay, s/veh	17.4		16.6			32.9			30.9			
Approach LOS	B		B			C			C			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	29.2		61.3			29.2			61.3			
Change Period (Y+Rc), s	5.5		5.5			5.5			5.5			
Max Green Setting (Gmax), s	34.5		74.5			34.5			74.5			
Max Q Clear Time (g_c+I1), s	20.8		39.1			23.1			47.7			
Green Ext Time (p_c), s	1.6		8.7			0.3			8.1			
Intersection Summary												
HCM 6th Ctrl Delay	20.1											
HCM 6th LOS	C											

HCM 6th TWSC
5: Beach Dr & Ballinger Way

09/06/2024

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	13	20	7	0	0	0	13	0	0	0	0	13
Future Vol, veh/h	13	20	7	0	0	0	13	0	0	0	0	13
Conflicting Peds, #/hr	6	0	18	18	0	0	24	0	6	6	0	6
Sign Control	Free	Free	Free	Yield	Yield	Yield	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	1080	1479	68	-	-	0	-	-	0
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	69	69	69	69	69	69	69	69	69
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	19	29	10	0	0	0	19	0	0	0	0	19
Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	6	0	0				124	96	58	84	101	30
Stage 1	-	-	-				90	90	-	6	6	-
Stage 2	-	-	-				34	6	-	78	95	-
Critical Hdwy	4.1	-	-				7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-				6.1	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-				-	-	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-				3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1628	-	-				855	798	1014	908	793	1050
Stage 1	-	-	-				922	824	-	-	-	-
Stage 2	-	-	-				-	-	-	936	820	-
Platoon blocked, %		-	-									
Mov Cap-1 Maneuver	1619	-	-				799	770	997	894	765	1020
Mov Cap-2 Maneuver	-	-	-				799	770	-	894	765	-
Stage 1	-	-	-				895	800	-	-	-	-
Stage 2	-	-	-				-	-	-	925	796	-
Approach	EB			NB			SB					
HCM Control Delay, s	2.4			9.6			8.6					
HCM LOS				A			A					
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1							
Capacity (veh/h)	799	1619	-	-	1020							
HCM Lane V/C Ratio	0.024	0.012	-	-	0.018							
HCM Control Delay (s)	9.6	7.2	0	-	8.6							
HCM Lane LOS	A	A	A	-	A							
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1							

Intersection

Int Delay, s/veh 0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	12	0	0	11
Future Vol, veh/h	0	0	12	0	0	11
Conflicting Peds, #/hr	6	0	0	1	1	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	48	48	48	48	48	48
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	25	0	0	23

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	55	26	0
Stage 1	26	-	-
Stage 2	29	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	958	1056	-
Stage 1	1002	-	-
Stage 2	999	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	951	1055	-
Mov Cap-2 Maneuver	951	-	-
Stage 1	1001	-	-
Stage 2	993	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1599
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0

HCM 6th Signalized Intersection Summary

1: Bothell Way NE (SR 522) & NE 170th St

09/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	10	61	7	5	23	82	1209	3	20	1199	24
Future Volume (veh/h)	85	10	61	7	5	23	82	1209	3	20	1199	24
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		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1723	1723	1723	1736	1736	1736	1723	1723	1723
Adj Flow Rate, veh/h	88	10	63	7	5	24	85	1246	3	21	1236	25
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	2	2	2
Cap, veh/h	163	15	310	41	37	84	106	2084	898	34	1926	857
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.06	0.63	0.63	0.02	0.59	0.59
Sat Flow, veh/h	505	73	1483	26	176	404	1654	3299	1421	1641	3273	1456
Grp Volume(v), veh/h	98	0	63	36	0	0	85	1246	3	21	1236	25
Grp Sat Flow(s),veh/h/ln	578	0	1483	606	0	0	1654	1650	1421	1641	1637	1456
Q Serve(g_s), s	0.0	0.0	4.2	0.4	0.0	0.0	6.1	26.8	0.1	1.5	30.0	0.9
Cycle Q Clear(g_c), s	22.8	0.0	4.2	23.2	0.0	0.0	6.1	26.8	0.1	1.5	30.0	0.9
Prop In Lane	0.90		1.00	0.19		0.67	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	178	0	310	163	0	0	106	2084	898	34	1926	857
V/C Ratio(X)	0.55	0.00	0.20	0.22	0.00	0.00	0.80	0.60	0.00	0.61	0.64	0.03
Avail Cap(c_a), veh/h	296	0	433	283	0	0	200	2084	898	198	1926	857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.3	0.0	39.2	39.4	0.0	0.0	55.4	13.1	8.2	58.3	16.3	10.3
Incr Delay (d2), s/veh	2.7	0.0	0.3	0.7	0.0	0.0	13.0	1.3	0.0	16.2	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.4	0.0	2.8	1.6	0.0	0.0	5.2	14.3	0.1	1.4	16.1	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.9	0.0	39.5	40.1	0.0	0.0	68.4	14.4	8.2	74.5	18.0	10.4
LnGrp LOS	D	A	D	D	A	A	E	B	A	E	B	B
Approach Vol, veh/h		161			36			1334			1282	
Approach Delay, s/veh		45.3			40.1			17.8			18.8	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	81.8		30.2	13.2	76.6		30.2				
Change Period (Y+Rc), s	5.5	6.1		5.0	5.5	6.1		5.0				
Max Green Setting (Gmax), s	14.5	53.9		35.0	14.5	53.9		35.0				
Max Q Clear Time (g_c+I1), s	3.5	28.8		24.8	8.1	32.0		25.2				
Green Ext Time (p_c), s	0.0	9.8		0.4	0.1	9.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			20.1									
HCM 6th LOS			C									

HCM 6th TWSC
2: Bothell Way NE (SR 522) & Middle Dwy

09/06/2024

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	48	0	1308	1244	69
Future Vol, veh/h	0	48	0	1308	1244	69
Conflicting Peds, #/hr	0	2	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	100	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	0	51	0	1377	1309	73

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 659	- 0	- 0
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	0 411	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 409	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	15	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 409	- -	- -
HCM Lane V/C Ratio	- 0.124	- -	- -
HCM Control Delay (s)	- 15	- -	- -
HCM Lane LOS	- C	- -	- -
HCM 95th %tile Q(veh)	- 0.4	- -	- -

09/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	528	16	159	10	7	6	162	1137	10	10	1144	492
Future Volume (veh/h)	528	16	159	10	7	6	162	1137	10	10	1144	492
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		0.94	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	568	0	0	11	7	6	171	1197	11	11	1204	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	726	0		17	11	9	198	1836	772	21	1482	
Arrive On Green	0.22	0.00	0.00	0.02	0.02	0.02	0.08	0.37	0.37	0.01	0.45	0.00
Sat Flow, veh/h	3333	0	1483	751	478	410	1654	3299	1387	1654	3299	1471
Grp Volume(v), veh/h	568	0	0	24	0	0	171	1197	11	11	1204	0
Grp Sat Flow(s),veh/h/ln	1667	0	1483	1639	0	0	1654	1650	1387	1654	1650	1471
Q Serve(g_s), s	19.3	0.0	0.0	1.7	0.0	0.0	12.3	36.1	0.6	0.8	38.0	0.0
Cycle Q Clear(g_c), s	19.3	0.0	0.0	1.7	0.0	0.0	12.3	36.1	0.6	0.8	38.0	0.0
Prop In Lane	1.00		1.00	0.46		0.25	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	726	0		38	0	0	198	1836	772	21	1482	
V/C Ratio(X)	0.78	0.00		0.64	0.00	0.00	0.86	0.65	0.01	0.52	0.81	
Avail Cap(c_a), veh/h	872	0		157	0	0	269	1836	772	131	1482	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.3	0.0	0.0	58.1	0.0	0.0	54.2	28.0	16.9	58.9	28.7	0.0
Incr Delay (d2), s/veh	2.8	0.0	0.0	16.6	0.0	0.0	18.7	1.8	0.0	18.4	5.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.2	0.0	0.0	1.6	0.0	0.0	10.3	21.6	0.3	0.8	21.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.1	0.0	0.0	74.7	0.0	0.0	72.9	29.8	16.9	77.2	33.6	0.0
LnGrp LOS	D	A		E	A	A	E	C	B	E	C	
Approach Vol, veh/h		568			24			1379			1215	
Approach Delay, s/veh		47.1			74.7			35.1			34.0	
Approach LOS		D			E			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	73.0		31.7	19.9	60.1		8.3				
Change Period (Y+Rc), s	5.5	6.2		5.6	5.5	6.2		5.5				
Max Green Setting (Gmax), s	9.5	44.8		31.4	19.5	34.8		11.5				
Max Q Clear Time (g_c+I1), s	2.8	38.1		21.3	14.3	40.0		3.7				
Green Ext Time (p_c), s	0.0	4.1		1.6	0.2	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				37.1								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary

4: NE 175th St & Ballinger Way (SR 104)

09/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	584	83	85	548	13	105	24	87	32	23	9
Future Volume (veh/h)	9	584	83	85	548	13	105	24	87	32	23	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	0.98		0.97	0.99		0.95
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	1736	1736	1736	1750	1750	1750	1750	1750	1750	1723	1723	1723
Adj Flow Rate, veh/h	9	615	87	89	577	14	111	25	92	34	24	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	0	0	0	0	0	0	2	2	2
Cap, veh/h	451	845	120	361	970	24	341	62	266	279	217	81
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	832	1482	210	756	1700	41	1058	333	1438	1264	1175	441
Grp Volume(v), veh/h	9	0	702	89	0	591	136	0	92	34	0	33
Grp Sat Flow(s),veh/h/ln	832	0	1691	756	0	1742	1391	0	1438	1264	0	1615
Q Serve(g_s), s	0.3	0.0	13.7	4.4	0.0	9.9	3.3	0.0	2.5	1.1	0.0	0.8
Cycle Q Clear(g_c), s	10.2	0.0	13.7	18.1	0.0	9.9	4.1	0.0	2.5	5.2	0.0	0.8
Prop In Lane	1.00		0.12	1.00		0.02	0.82		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	451	0	965	361	0	993	403	0	266	279	0	299
V/C Ratio(X)	0.02	0.00	0.73	0.25	0.00	0.60	0.34	0.00	0.35	0.12	0.00	0.11
Avail Cap(c_a), veh/h	1356	0	2804	1183	0	2887	1234	0	1104	1016	0	1240
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.6	0.0	7.1	13.7	0.0	6.3	16.7	0.0	15.9	19.0	0.0	15.2
Incr Delay (d2), s/veh	0.0	0.0	1.1	0.4	0.0	0.6	0.5	0.0	0.8	0.2	0.0	0.2
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	0.1	0.0	5.9	1.2	0.0	4.3	2.1	0.0	1.4	0.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.6	0.0	8.2	14.1	0.0	6.9	17.1	0.0	16.7	19.2	0.0	15.4
LnGrp LOS	A	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h	711		680			228			67			
Approach Delay, s/veh	8.2		7.8			17.0			17.3			
Approach LOS	A		A			B			B			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	13.8		31.1			13.8			31.1			
Change Period (Y+Rc), s	5.5		5.5			5.5			5.5			
Max Green Setting (Gmax), s	34.5		74.5			34.5			74.5			
Max Q Clear Time (g_c+I1), s	6.1		15.7			7.2			20.1			
Green Ext Time (p_c), s	1.2		6.3			0.2			5.5			
Intersection Summary												
HCM 6th Ctrl Delay			9.6									
HCM 6th LOS			A									

HCM 6th TWSC
5: Beach Dr & Ballinger Way

09/06/2024

Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	17	13	5	0	0	0	8	0	0	0	0	16
Future Vol, veh/h	17	13	5	0	0	0	8	0	0	0	0	16
Conflicting Peds, #/hr	3	0	17	23	0	9	17	0	7	9	0	3
Sign Control	Free	Free	Free	Yield	Yield	Yield	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	1080	1479	68	-	-	0	-	-	0
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	25	19	7	0	0	0	12	0	0	0	0	24

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	3	0	0		119	93	49	85	96
Stage 1	-	-	-		90	90	-	3	3
Stage 2	-	-	-		29	3	-	82	93
Critical Hdwy	4.1	-	-		7.1	6.5	6.2	7.1	6.5
Critical Hdwy Stg 1	-	-	-		6.1	5.5	-	-	-
Critical Hdwy Stg 2	-	-	-		-	-	-	6.1	5.5
Follow-up Hdwy	2.2	-	-		3.5	4	3.3	3.5	4
Pot Cap-1 Maneuver	1632	-	-		861	801	1025	906	798
Stage 1	-	-	-		922	824	-	-	-
Stage 2	-	-	-		-	-	-	931	822
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	1627	-	-		804	773	1008	892	770
Mov Cap-2 Maneuver	-	-	-		804	773	-	892	770
Stage 1	-	-	-		892	798	-	-	-
Stage 2	-	-	-		-	-	-	916	796

Approach	EB	NB	SB
HCM Control Delay, s	3.5	9.5	8.5
HCM LOS		A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	804	1627	-	-	1044
HCM Lane V/C Ratio	0.015	0.016	-	-	0.023
HCM Control Delay (s)	9.5	7.2	0	-	8.5
HCM Lane LOS	A	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0.1

Intersection

Int Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	12	1	0	10
Future Vol, veh/h	3	0	12	1	0	10
Conflicting Peds, #/hr	0	0	0	0	0	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	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	0	13	1	0	11

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	25	14	0
Stage 1	14	-	-
Stage 2	11	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	996	1072	-
Stage 1	1014	-	-
Stage 2	1017	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	996	1072	-
Mov Cap-2 Maneuver	996	-	-
Stage 1	1014	-	-
Stage 2	1017	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	996	1617
HCM Lane V/C Ratio	-	-	0.003	-
HCM Control Delay (s)	-	-	8.6	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

2027 Peak Hour Intersection Level of Service with the Project

HCM 6th Signalized Intersection Summary

1: Bothell Way NE (SR 522) & NE 170th St

09/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	22	53	7	18	19	60	1723	4	21	1340	16
Future Volume (veh/h)	83	22	53	7	18	19	60	1723	4	21	1340	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	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1750	1750	1723	1723	1723	1736	1736	1736	1723	1723	1723
Adj Flow Rate, veh/h	86	23	55	7	19	20	62	1776	4	22	1381	16
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	2	2	2
Cap, veh/h	109	24	324	26	59	46	78	2160	942	32	2054	915
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.05	0.65	0.65	0.04	1.00	1.00
Sat Flow, veh/h	314	111	1483	0	272	209	1654	3299	1438	1641	3273	1459
Grp Volume(v), veh/h	109	0	55	46	0	0	62	1776	4	22	1381	16
Grp Sat Flow(s),veh/h/ln	425	0	1483	480	0	0	1654	1650	1438	1641	1637	1459
Q Serve(g_s), s	0.0	0.0	4.8	0.0	0.0	0.0	5.9	64.4	0.2	2.1	0.0	0.0
Cycle Q Clear(g_c), s	35.0	0.0	4.8	35.0	0.0	0.0	5.9	64.4	0.2	2.1	0.0	0.0
Prop In Lane	0.79		1.00	0.15		0.43	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	133	0	324	131	0	0	78	2160	942	32	2054	915
V/C Ratio(X)	0.82	0.00	0.17	0.35	0.00	0.00	0.80	0.82	0.00	0.69	0.67	0.02
Avail Cap(c_a), veh/h	133	0	324	131	0	0	202	2160	942	149	2054	915
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.4	0.0	50.7	52.1	0.0	0.0	75.5	20.6	9.6	76.4	0.0	0.0
Incr Delay (d2), s/veh	31.4	0.0	0.2	1.6	0.0	0.0	16.8	3.7	0.0	23.0	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.6	0.0	3.3	2.8	0.0	0.0	5.2	32.3	0.1	1.9	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.8	0.0	51.0	53.7	0.0	0.0	92.3	24.3	9.6	99.4	1.8	0.0
LnGrp LOS	F	A	D	D	A	A	F	C	A	F	A	A
Approach Vol, veh/h		164			46			1842			1419	
Approach Delay, s/veh		80.8			53.7			26.6			3.3	
Approach LOS		F			D			C			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	110.9		40.5	13.0	106.5		40.5				
Change Period (Y+Rc), s	5.5	6.1		* 5.5	5.5	6.1		5.5				
Max Green Setting (Gmax), s	14.5	93.9		* 35	19.5	88.9		34.5				
Max Q Clear Time (g_c+I1), s	4.1	66.4		37.0	7.9	2.0		37.0				
Green Ext Time (p_c), s	0.0	16.3		0.0	0.1	15.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			20.0									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th TWSC
2: Bothell Way NE (SR 522) & Middle Dwy

09/06/2024

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	87	0	1826	1289	82
Future Vol, veh/h	0	87	0	1826	1289	82
Conflicting Peds, #/hr	0	2	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	100	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	89	0	1863	1315	84

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 662	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.92	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.31	- -	- -
Pot Cap-1 Maneuver	0 407	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 405	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	16.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 405	- -	- -
HCM Lane V/C Ratio	- 0.219	- -	- -
HCM Control Delay (s)	- 16.4	- -	- -
HCM Lane LOS	- C	- -	- -
HCM 95th %tile Q(veh)	- 0.8	- -	- -

09/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	657	18	164	9	9	10	219	1573	8	18	1218	646
Future Volume (veh/h)	657	18	164	9	9	10	219	1573	8	18	1218	646
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		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1736	1736	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	677	0	0	9	9	10	221	1589	8	18	1230	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	649	0		12	12	13	239	2051	886	28	1632	
Arrive On Green	0.20	0.00	0.00	0.02	0.02	0.02	0.29	1.00	1.00	0.02	0.49	0.00
Sat Flow, veh/h	3307	0	1471	521	521	579	1654	3299	1424	1654	3299	1471
Grp Volume(v), veh/h	677	0	0	28	0	0	221	1589	8	18	1230	0
Grp Sat Flow(s),veh/h/ln	1654	0	1471	1620	0	0	1654	1650	1424	1654	1650	1471
Q Serve(g_s), s	31.4	0.0	0.0	2.8	0.0	0.0	20.8	0.0	0.0	1.7	48.1	0.0
Cycle Q Clear(g_c), s	31.4	0.0	0.0	2.8	0.0	0.0	20.8	0.0	0.0	1.7	48.1	0.0
Prop In Lane	1.00		1.00	0.32		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	649	0		36	0	0	239	2051	886	28	1632	
V/C Ratio(X)	1.04	0.00		0.78	0.00	0.00	0.93	0.77	0.01	0.63	0.75	
Avail Cap(c_a), veh/h	649	0		147	0	0	305	2051	886	150	1632	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.53	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	64.3	0.0	0.0	77.8	0.0	0.0	56.1	0.0	0.0	78.1	32.6	0.0
Incr Delay (d2), s/veh	37.7	0.0	0.0	29.1	0.0	0.0	28.8	2.9	0.0	20.9	3.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	22.1	0.0	0.0	2.6	0.0	0.0	14.5	1.5	0.0	1.6	26.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	102.0	0.0	0.0	107.0	0.0	0.0	84.9	2.9	0.0	99.0	35.8	0.0
LnGrp LOS	F	A		F	A	A	F	A	A	F	D	
Approach Vol, veh/h		677			28			1818			1248	
Approach Delay, s/veh		102.0			107.0			12.9			36.8	
Approach LOS		F			F			B			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	105.7		37.0	28.6	85.4		9.1				
Change Period (Y+Rc), s	5.5	6.2		5.6	5.5	6.2		5.5				
Max Green Setting (Gmax), s	14.5	76.8		31.4	29.5	61.8		14.5				
Max Q Clear Time (g_c+I1), s	3.7	2.0		33.4	22.8	50.1		4.8				
Green Ext Time (p_c), s	0.0	19.7		0.0	0.3	6.3		0.0				

Intersection Summary

HCM 6th Ctrl Delay 37.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

4: NE 175th St & Ballinger Way (SR 104)

09/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	738	125	68	801	33	192	59	88	31	58	16
Future Volume (veh/h)	16	738	125	68	801	33	192	59	88	31	58	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		0.98	0.99		0.99	1.00		0.99
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	1750	1750	1750	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	16	753	128	69	817	34	196	60	90	32	59	16
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	244	898	153	212	1030	43	312	74	381	145	342	93
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	658	1453	247	640	1667	69	928	284	1460	1247	1311	356
Grp Volume(v), veh/h	16	0	881	69	0	851	256	0	90	32	0	75
Grp Sat Flow(s),veh/h/ln	658	0	1700	640	0	1736	1212	0	1460	1247	0	1667
Q Serve(g_s), s	1.7	0.0	37.3	8.7	0.0	33.4	15.8	0.0	4.4	2.3	0.0	3.2
Cycle Q Clear(g_c), s	35.1	0.0	37.3	46.1	0.0	33.4	18.9	0.0	4.4	21.2	0.0	3.2
Prop In Lane	1.00		0.15	1.00		0.04	0.77		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	244	0	1051	212	0	1073	387	0	381	145	0	435
V/C Ratio(X)	0.07	0.00	0.84	0.33	0.00	0.79	0.66	0.00	0.24	0.22	0.00	0.17
Avail Cap(c_a), veh/h	377	0	1394	341	0	1423	552	0	554	293	0	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	13.8	32.0	0.0	13.0	33.3	0.0	26.4	41.8	0.0	26.0
Incr Delay (d2), s/veh	0.1	0.0	3.6	0.9	0.0	2.3	1.9	0.0	0.3	0.8	0.0	0.2
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	0.5	0.0	19.4	2.5	0.0	17.7	9.3	0.0	2.8	1.3	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	0.0	17.4	32.9	0.0	15.3	35.2	0.0	26.8	42.6	0.0	26.2
LnGrp LOS	C	A	B	C	A	B	D	A	C	D	A	C
Approach Vol, veh/h	897		920			346			107			
Approach Delay, s/veh	17.5		16.7			33.0			31.1			
Approach LOS	B		B			C			C			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	29.2		61.7			29.2			61.7			
Change Period (Y+Rc), s	5.5		5.5			5.5			5.5			
Max Green Setting (Gmax), s	34.5		74.5			34.5			74.5			
Max Q Clear Time (g_c+I1), s	20.9		39.3			23.2			48.1			
Green Ext Time (p_c), s	1.6		8.7			0.3			8.1			
Intersection Summary												
HCM 6th Ctrl Delay	20.2											
HCM 6th LOS	C											

HCM 6th TWSC
5: Beach Dr & Ballinger Way

09/06/2024

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	21	20	7	0	0	0	13	0	0	0	0	27
Future Vol, veh/h	21	20	7	0	0	0	13	0	0	0	0	27
Conflicting Peds, #/hr	6	0	18	18	0	0	24	0	6	6	0	6
Sign Control	Free	Free	Free	Yield	Yield	Yield	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	1080	1479	68	-	-	0	-	-	0
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	69	69	69	69	69	69	69	69	69
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	30	29	10	0	0	0	19	0	0	0	0	39

Major/Minor	Major1			Minor1		Minor2			
Conflicting Flow All	6	0	0	156	118	58	106	123	30
Stage 1	-	-	-	112	112	-	6	6	-
Stage 2	-	-	-	44	6	-	100	117	-
Critical Hdwy	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	6.1	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1628	-	-	815	776	1014	878	771	1050
Stage 1	-	-	-	898	807	-	-	-	-
Stage 2	-	-	-	-	-	-	911	803	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	1619	-	-	742	744	997	860	739	1020
Mov Cap-2 Maneuver	-	-	-	742	744	-	860	739	-
Stage 1	-	-	-	866	778	-	-	-	-
Stage 2	-	-	-	-	-	-	894	774	-

Approach	EB	NB	SB
HCM Control Delay, s	3.2	10	8.7
HCM LOS		B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	742	1619	-	-	1020
HCM Lane V/C Ratio	0.025	0.019	-	-	0.038
HCM Control Delay (s)	10	7.3	0	-	8.7
HCM Lane LOS	B	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0.1

Intersection

Int Delay, s/veh 2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	0	12	8	0	11
Future Vol, veh/h	14	0	12	8	0	11
Conflicting Peds, #/hr	6	0	0	1	1	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	48	48	48	48	48	48
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	29	0	25	17	0	23

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	64	35	0
Stage 1	35	-	-
Stage 2	29	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	947	1044	-
Stage 1	993	-	-
Stage 2	999	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	940	1043	-
Mov Cap-2 Maneuver	940	-	-
Stage 1	992	-	-
Stage 2	993	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	940	1577
HCM Lane V/C Ratio	-	-	0.031	-
HCM Control Delay (s)	-	-	9	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th Signalized Intersection Summary

1: Bothell Way NE (SR 522) & NE 170th St

09/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	10	61	7	5	23	82	1212	3	20	1202	24
Future Volume (veh/h)	85	10	61	7	5	23	82	1212	3	20	1202	24
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		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1750	1750	1723	1723	1723	1736	1736	1736	1723	1723	1723
Adj Flow Rate, veh/h	88	10	63	7	5	24	85	1249	3	21	1239	25
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	2	2	2
Cap, veh/h	163	15	310	41	37	84	106	2084	898	34	1926	857
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.06	0.63	0.63	0.02	0.59	0.59
Sat Flow, veh/h	505	73	1483	26	176	404	1654	3299	1421	1641	3273	1456
Grp Volume(v), veh/h	98	0	63	36	0	0	85	1249	3	21	1239	25
Grp Sat Flow(s),veh/h/ln	578	0	1483	606	0	0	1654	1650	1421	1641	1637	1456
Q Serve(g_s), s	0.0	0.0	4.2	0.4	0.0	0.0	6.1	26.9	0.1	1.5	30.1	0.9
Cycle Q Clear(g_c), s	22.8	0.0	4.2	23.2	0.0	0.0	6.1	26.9	0.1	1.5	30.1	0.9
Prop In Lane	0.90		1.00	0.19		0.67	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	178	0	310	163	0	0	106	2084	898	34	1926	857
V/C Ratio(X)	0.55	0.00	0.20	0.22	0.00	0.00	0.80	0.60	0.00	0.61	0.64	0.03
Avail Cap(c_a), veh/h	296	0	433	283	0	0	200	2084	898	198	1926	857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.3	0.0	39.2	39.4	0.0	0.0	55.4	13.1	8.2	58.3	16.3	10.3
Incr Delay (d2), s/veh	2.7	0.0	0.3	0.7	0.0	0.0	13.0	1.3	0.0	16.2	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.4	0.0	2.8	1.6	0.0	0.0	5.2	14.4	0.1	1.4	16.2	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.9	0.0	39.5	40.1	0.0	0.0	68.4	14.4	8.2	74.5	18.0	10.4
LnGrp LOS	D	A	D	D	A	A	E	B	A	E	B	B
Approach Vol, veh/h	161			36			1337			1285		
Approach Delay, s/veh	45.3			40.1			17.8			18.8		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	8.0	81.8	30.2		13.2	76.6	30.2					
Change Period (Y+Rc), s	5.5	6.1	5.0		5.5	6.1	5.0					
Max Green Setting (Gmax), s	14.5	53.9	35.0		14.5	53.9	35.0					
Max Q Clear Time (g_c+I1), s	3.5	28.9	24.8		8.1	32.1	25.2					
Green Ext Time (p_c), s	0.0	9.8	0.4		0.1	9.2	0.1					
Intersection Summary												
HCM 6th Ctrl Delay	20.1											
HCM 6th LOS	C											

HCM 6th TWSC
2: Bothell Way NE (SR 522) & Middle Dwy

09/06/2024

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	48	0	1311	1247	69
Future Vol, veh/h	0	48	0	1311	1247	69
Conflicting Peds, #/hr	0	2	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	100	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	0	51	0	1380	1313	73

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	661	-	0	-	0
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	410	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	408	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	408	-	-
HCM Lane V/C Ratio	-	0.124	-	-
HCM Control Delay (s)	-	15.1	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

HCM 6th Signalized Intersection Summary

3: Bothell Way NE (SR 522) & Ballinger Way (SR 104)/Ballinger Way

09/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	528	17	159	13	9	10	162	1137	13	13	1144	492
Future Volume (veh/h)	528	17	159	13	9	10	162	1137	13	13	1144	492
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		0.94	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	569	0	0	14	9	11	171	1197	14	14	1204	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	727	0		19	12	15	199	1809	760	26	1462	
Arrive On Green	0.22	0.00	0.00	0.03	0.03	0.03	0.04	0.18	0.18	0.02	0.44	0.00
Sat Flow, veh/h	3333	0	1483	668	429	525	1654	3299	1386	1654	3299	1471
Grp Volume(v), veh/h	569	0	0	34	0	0	171	1197	14	14	1204	0
Grp Sat Flow(s),veh/h/ln	1667	0	1483	1622	0	0	1654	1650	1386	1654	1650	1471
Q Serve(g_s), s	19.3	0.0	0.0	2.5	0.0	0.0	12.3	40.5	1.0	1.0	38.4	0.0
Cycle Q Clear(g_c), s	19.3	0.0	0.0	2.5	0.0	0.0	12.3	40.5	1.0	1.0	38.4	0.0
Prop In Lane	1.00		1.00	0.41		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	727	0		46	0	0	199	1809	760	26	1462	
V/C Ratio(X)	0.78	0.00		0.74	0.00	0.00	0.86	0.66	0.02	0.54	0.82	
Avail Cap(c_a), veh/h	872	0		155	0	0	269	1809	760	131	1462	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.2	0.0	0.0	57.9	0.0	0.0	56.6	38.8	22.6	58.6	29.3	0.0
Incr Delay (d2), s/veh	2.8	0.0	0.0	20.7	0.0	0.0	18.2	1.9	0.0	16.7	5.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.2	0.0	0.0	2.3	0.0	0.0	10.7	25.3	0.6	1.0	22.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.1	0.0	0.0	78.6	0.0	0.0	74.8	40.7	22.7	75.4	34.7	0.0
LnGrp LOS	D	A		E	A	A	E	D	C	E	C	
Approach Vol, veh/h	569			34			1382			1218		
Approach Delay, s/veh	47.1			78.6			44.7			35.1		
Approach LOS	D			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.4	72.0		31.8	20.0	59.4		8.9				
Change Period (Y+Rc), s	5.5	6.2		5.6	5.5	6.2		5.5				
Max Green Setting (Gmax), s	9.5	44.8		31.4	19.5	34.8		11.5				
Max Q Clear Time (g_c+I1), s	3.0	42.5		21.3	14.3	40.4		4.5				
Green Ext Time (p_c), s	0.0	1.6		1.6	0.2	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 41.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

4: NE 175th St & Ballinger Way (SR 104)

09/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	585	83	85	550	13	105	24	87	32	23	9
Future Volume (veh/h)	9	585	83	85	550	13	105	24	87	32	23	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	0.98		0.97	0.99		0.95
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	1736	1736	1736	1750	1750	1750	1750	1750	1750	1723	1723	1723
Adj Flow Rate, veh/h	9	616	87	89	579	14	111	25	92	34	24	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	0	0	0	0	0	0	2	2	2
Cap, veh/h	450	846	119	361	971	23	341	62	266	278	217	81
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	831	1482	209	755	1700	41	1058	333	1438	1264	1175	441
Grp Volume(v), veh/h	9	0	703	89	0	593	136	0	92	34	0	33
Grp Sat Flow(s),veh/h/ln	831	0	1691	755	0	1742	1390	0	1438	1264	0	1615
Q Serve(g_s), s	0.3	0.0	13.7	4.4	0.0	10.0	3.3	0.0	2.5	1.1	0.0	0.8
Cycle Q Clear(g_c), s	10.3	0.0	13.7	18.2	0.0	10.0	4.1	0.0	2.5	5.2	0.0	0.8
Prop In Lane	1.00		0.12	1.00		0.02	0.82		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	450	0	966	361	0	994	402	0	266	278	0	299
V/C Ratio(X)	0.02	0.00	0.73	0.25	0.00	0.60	0.34	0.00	0.35	0.12	0.00	0.11
Avail Cap(c_a), veh/h	1350	0	2798	1179	0	2881	1232	0	1102	1014	0	1238
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.6	0.0	7.1	13.8	0.0	6.3	16.7	0.0	16.0	19.0	0.0	15.3
Incr Delay (d2), s/veh	0.0	0.0	1.1	0.4	0.0	0.6	0.5	0.0	0.8	0.2	0.0	0.2
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	0.1	0.0	5.9	1.2	0.0	4.3	2.2	0.0	1.4	0.6	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.7	0.0	8.2	14.1	0.0	6.9	17.2	0.0	16.8	19.2	0.0	15.4
LnGrp LOS	A	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h												
712												
Approach Delay, s/veh												
8.2												
Approach LOS												
A												
Timer - Assigned Phs												
2												
4												
6												
8												
Phs Duration (G+Y+Rc), s												
13.8												
31.2												
13.8												
31.2												
Change Period (Y+Rc), s												
5.5												
5.5												
5.5												
Max Green Setting (Gmax), s												
34.5												
74.5												
34.5												
74.5												
Max Q Clear Time (g_c+I1), s												
6.1												
15.7												
7.2												
20.2												
Green Ext Time (p_c), s												
1.2												
6.3												
0.2												
5.5												
Intersection Summary												
HCM 6th Ctrl Delay												
9.6												
HCM 6th LOS												
A												

HCM 6th TWSC
5: Beach Dr & Ballinger Way

09/06/2024

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	13	5	0	0	0	8	0	0	0	0	25
Future Vol, veh/h	24	13	5	0	0	0	8	0	0	0	0	25
Conflicting Peds, #/hr	3	0	17	23	0	9	17	0	7	9	0	3
Sign Control	Free	Free	Free	Yield	Yield	Yield	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	1080	1479	68	-	-	0	-	-	0
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	36	19	7	0	0	0	12	0	0	0	0	37
Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	3	0	0				148	115	49	107	118	20
Stage 1	-	-	-				112	112	-	3	3	-
Stage 2	-	-	-				36	3	-	104	115	-
Critical Hdwy	4.1	-	-				7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-				6.1	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-				-	-	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-				3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1632	-	-				825	779	1025	877	776	1064
Stage 1	-	-	-				898	807	-	-	-	-
Stage 2	-	-	-				-	-	-	907	804	-
Platoon blocked, %		-	-									
Mov Cap-1 Maneuver	1627	-	-				757	747	1008	859	744	1044
Mov Cap-2 Maneuver	-	-	-				757	747	-	859	744	-
Stage 1	-	-	-				864	776	-	-	-	-
Stage 2	-	-	-				-	-	-	887	773	-
Approach	EB			NB			SB					
HCM Control Delay, s	4.1			9.8			8.6					
HCM LOS				A			A					
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1							
Capacity (veh/h)	757	1627	-	-	1044							
HCM Lane V/C Ratio	0.016	0.022	-	-	0.036							
HCM Control Delay (s)	9.8	7.3	0	-	8.6							
HCM Lane LOS	A	A	A	-	A							
HCM 95th %tile Q(veh)	0	0.1	-	-	0.1							

Intersection

Int Delay, s/veh 2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	0	12	8	0	10
Future Vol, veh/h	12	0	12	8	0	10
Conflicting Peds, #/hr	0	0	0	0	0	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	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	13	0	13	9	0	11

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	29	18	0
Stage 1	18	-	-
Stage 2	11	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	991	1066	-
Stage 1	1010	-	-
Stage 2	1017	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	991	1066	-
Mov Cap-2 Maneuver	991	-	-
Stage 1	1010	-	-
Stage 2	1017	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	991	1607
HCM Lane V/C Ratio	-	-	0.013	-
HCM Control Delay (s)	-	-	8.7	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0