PUYALLUP, WA


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December 2022

## DOS LAGOS APARTMENTS - PARCELS "D" \& "E" TRAFFIC IMPACT ANALYSIS

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## DOS LAGOS APARTMENTS - PARCELS "D" \& "E" TRAFFIC IMPACT ANALYSIS

## 1. INTRODUCTION

Per City comments, vehicle trips generated by Parcels "D" and "E" must be evaluated as one project/Traffic Impact Analysis (TIA) per SEPA. The main goals of this study focus on the assessment of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the adjacent streets serving the subject site and gathering existing vehicular volumes within a defined study area. Forecasts of future traffic and dispersion patterns on the street system are then determined using established trip generation and distribution techniques. As a final step, appropriate conclusions and mitigation measures are defined, if needed.

## 2. PROJECT DESCRIPTION

Dos Lagos Apartments - Parcels " D " \& " E " is a proposed mixed-use project comprising two sites (Parcel "D" and Parcel "E") in the city of Puyallup. The two sites are to comprise a cumulative 92 multi-family dwelling units and 1,100 square feet of commercial/office space.

Parcel "D", comprising a cumulative 2.30-acres, is located within tax parcel \#'s: 0419106026 \& -2107 . With a site address of 303 39th Avenue SE, Parcel " $D$ " is to encompass 47 multi-family dwelling units and 1,100 square feet of commercial/office space. 3rd Street SE bisects Parcel "D", which is to provide primary access. An existing driveway extending north from 39th Avenue SE—west of 3rd Street SE—may additionally provide internal connection to 3rd Street SE, subsequently providing site access.

Parcel " $E$ ", with a site address of 405 39th Avenue SE, is located within an undeveloped, 1.89-acre tax parcel \#: 0419106028. This easterly parcel is situated on the northwestern corner of 39th Avenue SE \& 5th Street SE. Approximately 45 multi-family dwelling units are proposed within Parcel " $E$ ". Access to Parcel " $E$ " is proposed via one right-in, right-out driveway extending north from 39th Avenue SE.

Figure 1 on the following page shows the vicinity map and adjacent street system in relation to both subject sites. Conceptual site plans illustrating the proposed site layout for Parcels "D" and E" are presented in Figures 2A and 2B respectively.

Figure 1: Aerial Vicinity Map




TRAFFIC AND CIVIL ENGINEERING

## 3. EXISTING CONDITIONS

### 3.1 Surrounding Roadways

The street network serving the proposed project consists of a variety of roadways. The major roadways and arterials surrounding the site are listed and described below.

39th Avenue SE: is an east-west, 5-lane major arterial bordering the subject site to the south. The roadway cross-section in the project vicinity typically consists of 2 travel lanes in either direction and a center two-way left-turn lane or left turn pockets at major intersections. Travel lanes are approximately 10- to 11-feet in width and marked crosswalks provided at major intersections. Curb, gutter and sidewalk are provided along both sides of the roadway in the subject site vicinity. The posted speed limit is $35-\mathrm{mph}$.

43rd Avenue SE: is an east-west, 3-lane minor arterial bordering Parcel "C" to the south. The roadway cross-section in the project vicinity typically consists of 1 travel lane in either direction and a center two-way left-turn lane or left turn pockets at major intersections. Travel lanes are approximately 11 - to 15 -feet in width and marked crosswalks provided at major intersections. Curb, gutter and sidewalk are generally provided east of 5th Street SE in the subject site vicinity. Between SR 161 and 5th Street SE, curb, gutter and sidewalk are provided along the southern side of the roadway with narrow paved segments and grass/gravel provided along the northern side. The posted speed limit is $35-\mathrm{mph}$.

5th Street SE: is a north-south, 3-lane minor arterial located east of the subject site. The roadway cross-section in the project vicinity typically consists of 1 travel lane in either direction and a center two-way left-turn lane or left turn pockets at major intersections. Travel lanes are approximately 13 - to 15 -feet in width and marked crosswalks provided at major intersections. Curb, gutter and sidewalk are provided along the east side of the roadway. Along the west side of the roadway, curb and gutter are generally provided with segments of sidewalk to the north. The posted speed limit is $25-\mathrm{to} 30-\mathrm{mph}$.

### 3.2 Transit Service

The Pierce Transit regional bus schedule was referenced to determine if transit is provided in the vicinity of the subject site. Table 1 below outlines specifications of Routes 4, 402 and 425 , which provide service within walking distance of the subject parcels.

Table 1: Bus Routes

| Route | Description | Weekday Service | Saturday | Sunday | Nearest Stop |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 4 | Lakewood - South Hill: <br> Lakewood TC to Pierce College | $\begin{aligned} & \text { 5:45 AM - 8:50 PM } \\ & \text { (every } \sim 30 \text { minutes) } \end{aligned}$ | 7:45 AM - 10:25 PM (every ~60 minutes) | 8:05 AM - 7:53 PM <br> (every ~60 minutes) | 43rd Ave SE \& 5th St SE |
| 402 | Meridian - South Hill Mall TC to Fed. Way TC | 5:00 AM - 8:48 PM <br> (every ~60 minutes) | 7:10 AM - 8:35 PM (every ~60 minutes) | 9:41 AM - 7:26 PM <br> (every ~60 minutes) | 43rd Ave SE \& SR 161 |
| 425 | Puyallup Connector - South Hill <br> Mall TC to Puyallup Station | 11:19 AM - 5:18 PM (every $\sim 60$ minutes) | $\begin{aligned} & \text { 9:15 AM - 6:21 PM } \\ & \text { (every ~120 minutes) } \end{aligned}$ | Not Provided | 43rd Ave SE \& 5th St SE |

Given the proximity and availability, transit use stemming from the project site can be expected. Refer to the Pierce County Transit schedule for more detailed information.

### 3.3 Roadway Improvements

The current City of Puyallup Six-Year (2023-2028) Transportation Improvement Program was reviewed to determine if any transportation improvement projects are planned in the vicinity of the subject site. Table 2 below provides descriptions of the nearest projects.

Table 2: Transportation Improvement Projects

| Name | Location | Improvement | 20 yr . Cost |
| :---: | :---: | :---: | :---: |
| 5th St SE/7th Ave SW Bike Improvements (P.N: 5) | 23rd Ave SE to 43rd Ave SE | Add shared use path on one side | \$7,000,000 |
| 9th St SW Corridor Improvements (P.N: 11) | 15th Ave SW to 31st Ave SW | 3 lanes with curb, gutter, sidewalk, bike lanes and street lighting on both sides and additional lane capacity at 31 st \& 9th. Scoping report recommended. | \$18,510,000 |
| 31st Ave SW Corridor Improvements (P.N: 15) | Fruitland to 9th St SW | 3 lanes with curb, gutter, sidewalk, bike lanes and street lighting on both sides and additional lane capacity at 31 st \& 9th. | \$17,900,000 |
| Intersection Signal Control (P.N: 18) | 23rd Ave SE \& 7th St SE | New signal as part of the road improvement project. | To Be Determined |
| 31st Ave SW \& 9th St SW Intersection Improvements (P.N: 23) | Intersection | Add a right-turn only pocket for west bound traffic on 31st Ave SW. | To Be Determined |
| Intersection Improvements <br> @ 10th St SE (P.N: 24) | 43rd Ave SE; Meridian to 10th St SE | RAB or signal at 10th St SE and curb, gutter, sidewalk and street lighting on north half of 43 rd Ave SE. Plus complete roadway to city standards from Meridian to 5th St with Meridian intersection improvements adding a right turn lane. | To Be <br> Determined |
| 39th Ave SW Intersection Improvements (P.N: 26) | 17th St SW to Meridian | Traffic signal improvements to include flashing yellow arrows and adaptive signal control technology. | To Be <br> Determined |
| Adaptive on 5th St SE (P.N: 27) | Along 5th St SE | Adaptive signals along 5th St SE at 23rd, 31st, 35th, 37 th, 39 th, 43 rd ( 6 signals) | To Be Determined |
| 23rd Ave SE Road Improvement (P.N: 33) | Meridian to 9th St SE | 3 lanes with curb, gutter, sidewalk and street lighting and a signal at 7th St SE \& 23rd Ave SE plus bike lanes. | \$6,210,000 |
| 39th \& 37th Ave SE Road Maintenance (P.N: 46) | 10th St SE to 5th St SE | Overlay roadway and striping. | \$2,200,000 |
| 31st Ave SW Road Maintenance (P.N: 48) | 512 Hwy to 200' W/O 9th | This is primarily an overlay with some improvements at the intersection of 9th St SW \& 31st Ave SW. | To Be <br> Determined |

### 3.4 Peak Hour Volumes

Field data for this study was collected in October of 2022. Traffic counts were administered at the following locations:

- 39th Avenue SE \& Westerly Driveway (Willows Shopping Center)
- 39th Avenue SE \& 3rd Street SE/Driveway
- 39th Avenue SE \& 5th Street SE

Data was obtained during the evening peak period between the hours of 4:00 PM - 6:00 PM, which generally translates to highest overall roadway volumes in a given 24-hour period. The one hour reflecting highest overall roadway volumes (peak hour) was then derived from these counts. Existing PM peak hour volumes at the study intersections are illustrated in Figure 3. Full-count sheets have been included in the appendix.

### 3.5 Peak Hour Non-Motorist Activity \& Infrastructure

Non-motorist activity was observed during routine PM peak hour turning movement counts. Table 3 below summarizes weekday PM peak hour non-motorist crossing activity observed at each leg for all study intersections.

Table 3: PM Peak Hour Non-Motorist Movements

| Intersection | Peak Hour | Movements | Intersection Leg |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | N | E | S | W |
| 39th Ave SE \& West Driveway (Willows Shopping Center) | 4:30-5:30 PM | Ped | 2 | 0 | 2 | 0 |
|  |  | Bike | 0 | 0 | 0 | 0 |
| 39th Ave SE \& 3rd St SE | 5:00-6:00 PM | Ped | 2 | 0 | 2 | 0 |
|  |  | Bike | 0 | 0 | 1 | 0 |
| 39th Ave SE \& 5th St SE | 4:15-5:15 PM | Ped | 1 | 7 | 0 | 1 |
|  |  | Bike | 0 | 0 | 0 | 0 |

The 39th Avenue SE roadway is currently built out with existing curb, gutter, sidewalk, and streetlights. The signalized intersection of 5th Street SE \& 39th Avenue SE facilitates pedestrian crossings via an actuated pedestrian signal phase. Continuous sidewalk paths/pedestrian crossings are available between the subject parcels and commercial opportunities provided along SR-161 to the west and to Bradley Lake Park to the north. Moreover, planned City improvements would improve non-motorist connectivity in the subject site vicinity. Any frontage or non-motorist improvements to 39th Avenue SE or 3rd Street SE should be coordinated with the City.


### 3.6 Sight Distance at Access Driveways

## Parcel "D"

Primary access to Parcel "D" is proposed via 3rd Street SE, which bisects the subject site and will provide connections northerly to 37th Avenue SE and southerly to 39th Avenue SE. Additional access may be provided by of way an existing westerly driveway extending north from 39th Avenue SE, which currently serves the Willows Shopping Center.
Assessments were made of the existing access points on 39th Avenue SE to determine whether adequate entering sight distance (ESD) and stopping sight distance (SSD) can be provided for project traffic. Based on City of Puyallup standards, approximately 415-feet of ESD and 400-feet of SSD would be required at each access. Sight lines at the west access are provided to 39th Avenue's intersection with SR 161. Moreover, sight lines at 3rd Street SE looking east are provided to 39th Avenue's intersection with 5th Street SE.

It should be noted that 39th Avenue SE comprises horizontal curvature. Currently, sight distance looking east at the westerly shopping center driveway and looking east from 3rd Street SE \& 39th Avenue SE are limited as motorists depart the respective accesses and enter 39th Avenue SE. To improve conditions and meet sight line requirements, Parcel "D" frontage along the north side of 39th Avenue SE was designed to provide clear sight lines. Depicted below within the orange hatch is the sight distance triangle for the westerly 39th Avenue SE driveway. A full-sized image is available in the appendix. As illustrated, project development would improve existing sight line conditions by clearing all obstructions within the sight distance triangle. With clear visibility, a full-movement access is supported for continuation at both locations on 39th Avenue SE. Final verification of sight lines will be conducted during the civil review.

Parcel "D" Sight Distance Triangle


## Parcel "E"

Primary access to Parcel " $E$ " is proposed via one new driveway extending north from 39th Avenue SE. Given the access' proximity to the easterly intersection of 39th Avenue SE \& 5th Street SE, the driveway would be restricted to right-turn movements only. Based on the $45-\mathrm{mph}$ design speed ( 35 -mph posted speed limit) on 39th Avenue SE, approximately 415 -feet of ESD and 400 -feet of SSD would be required per City standards. A preliminary review of existing roadway geometrics indicates that sight distance requirements are met. Sight lines are clear looking east to and through 39th Avenue SE's intersection with 5th Street SE. As such, no sight distance deficiencies are identified at this time. Final verification of sight lines will be conducted during the civil review.

## 4. FUTURE TRAFFIC CONDITIONS

### 4.1 Trip Generation

Trip generation is defined as the number of vehicle movements that enter or exit the respective project site during a designated time period such as the PM peak hour or an entire day. The magnitude of the anticipated vehicle trip generation for the proposed project was derived from the Institute of Transportation Engineers (ITE) publication, Trip Generation, 11th Edition. Consistent with the ITE Manual, Land Use Code (LUC) 221 Multifamily Housing (Mid-Rise) was utilized for the apartment land uses within both parcels. Moreover, the designated land use for the proposed commercial/office component with Parcel "D" was defined as Small Office (LUC 712). Dwelling units (LUC 221) and square footage (LUC 712) were used as the input variables and average rates were used to determine trip ends. Table 4 on the following page summarizes anticipated vehicular movements for the average weekday daily trips (AWDT), AM and PM peak hours.

Table 4: Project Trip Generation

| Parcel | Land Use | Size | AWDT | AM Peak-Hour Trips |  |  | PM Peak-Hour Trips |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | In | Out | Total | In | Out | Total |
| "D" | Multi-Family (LUC 221) | 47 dwelling units | 213 | 4 | 13 | 17 | 11 | 7 | 18 |
|  | Small Office (LUC 712) | 1.1 ksf | 16 | 2 | 0 | 2 | 1 | 1 | 2 |
|  | Total Parcel "D" Site Trips |  | 229 | 6 | 13 | 19 | 12 | 8 | 20 |
| "E" | Multi-Family (LUC 221) | 45 dwelling units | 204 | 4 | 13 | 17 | 11 | 7 | 18 |

According to ITE data, Parcel "D" is anticipated to generate 229 average weekday daily trips with 19 trips ( 6 inbound / 13 outbound) occurring in the AM peak hour and 20 trips (12 inbound / 8 outbound) occurring in the PM peak hour. Parcel "E" is anticipated to generate 204 average weekday daily trips with 17 trips ( 4 inbound / 13 outbound) occurring in the AM peak hour and 18 trips ( 11 inbound / 7 outbound) occurring in the PM peak hour. Trip generation output sheets have been attached in the appendix for reference.

### 4.2 Distribution \& Assignment

Trip distribution describes the process by which project generated trips are dispersed on the roadway network surrounding the site. Trip distribution percentages were derived in discussion with the City during the scoping process. PM peak hour trip distribution and assignment for Parcels "D" and "E" are provided in Figures 4A and 4B, respectively. For Parcel " D ", project trips were consolidated and dispersed between the westerly shopping center driveway and the 3rd Street SE \& 39th Avenue SE access.

### 4.3 Peak Hour Volumes

A 3-year horizon of 2025 was used for future traffic delay analysis. Forecast 2025 background traffic volumes were derived by applying a 2.0 percent compound annual growth rate to the existing PM peak hour volumes shown in Figure 3. In addition, pipeline volumes associated with the proposed Dos Lagos Parcels "B" and "C" projects were incorporated into future volumes. PM pipeline volumes are shown in Figure $A$ in the appendix. Figure $B$ in the appendix illustrates PM peak hour volumes associated with all Dos Lagos projects (Parcels "B", "C", "D" and "E").

Forecast 2025 background peak hour volumes and volumes with the addition of projectgenerated traffic are presented in Figures 5 and 6, respectively.





### 4.4 Level of Service

Peak hour delays were determined through the use of the Highway Capacity Manual6th Edition. Capacity analysis is used to determine level of service (LOS) which is an established measure of congestion for transportation facilities. The range ${ }^{2}$ for intersection level of service is LOS A to LOS F with the former indicating the best operating conditions with low control delays and the latter indicating the worst conditions with heavy control delays. Detailed descriptions of intersection LOS are given in the 2016 Highway Capacity Manual. Level of service calculations were made through the use of the Synchro 11 analysis program. For side-street stop-controlled intersections, LOS is determined by the approach with the highest delay. For signalized intersections, LOS is determined by overall average delay for all approaches. Table 5 below summarizes calculated delays for existing and forecast 2025 PM peak hour conditions at the outlying study/access intersections.

Table 5: Existing \& Forecast 2025 PM Peak Hour Level of Service
Delays given in seconds per vehicle
Existing 2025 Without 2025 With

| Intersection | Control | LOS | Delay | LOS | Delay | LOS | Delay |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 39th Ave SE \& West Access <br> (Willows Shopping Center) | Stop | B | 11.9 | B | 12.2 | B | 12.4 |
|  <br> 3rd St SE | Stop | B | 11.5 | B | 11.8 | B | 11.8 |
|  <br> Parcel "E" Access <br>  <br> 5th St SE | Stop <br> (RI-RO) | - | - | - | - | A | 9.3 |

The City of Puyallup has adopted LOS D standard for most city intersections. PM peak hour delays are shown to continue to operate satisfactorily under forecast analysis with LOS B conditions or better at all project accesses and outlying study intersections. No intersection deficiencies are identified as a result of the proposed Dos Lagos - Parcels "D" \& "E" development.

| 2 Signalized Intersections - Level of Service |  | Stop Controlled Intersections - Level of Service |  |
| :---: | :---: | :---: | :---: |
|  | Control Delay per |  | Control Delay per |
| Level of Service | Vehicle (sec) | Level of Service | Vehicle (sec) |
| A | $\leq 10$ | A | $\leq 10$ |
| B | $>10$ and $\leq 20$ | B | $>10$ and $\leq 15$ |
| C | $>20$ and $\leq 35$ | C | $>15$ and $\leq 25$ |
| D | $>35$ and $\leq 55$ | D | $>25$ and $\leq 35$ |
| E | $>55$ and $\leq 80$ | E | $>35$ and $\leq 50$ |
| F | $>80$ | F | $>50$ |
| Highway Capacity Manual, 6th Edition |  |  |  |

It should be noted that no unserved demand was observed at the signalized study intersection of 39th Avenue SE \& 5th Street SE. Moreover, the City of Puyallup's Six Year Transportation Improvement Plan indicates 5th Street SE is scheduled for adaptive signals from 23 rd Avenue SE to 43 rd Avenue SE. This project may further improve future service levels at the signalized study intersection of 39th Avenue SE \& 5th Street SE.

## 5. SUMMARY \& MITIGATION

The Dos Lagos Apartments - Parcels "D" \& "E" project proposes for the construction of a mixed-used development within two parcels encompassing a cumulative 92 multifamily apartment units and 1,100 square feet of commercial/office space in the city of Puyallup. Parcel "D" comprises a cumulative 2.30-acres within tax parcel \#'s: 041910-6026 \& -2107. Approximately 47 multi-family dwelling units and 1,100 square feet of commercial/office space are proposed within Parcel " D ". Primary access to Parcel " D " is to occur via 3rd Street SE. An existing driveway extending north from 39th Avenue SE-west of 3rd Street SE—may additionally provide internal connection to 3rd Street SE, subsequently providing site access. Parcel "E" comprises 1.89-acre tax parcel \#: 0419106028 and is situated on the northwestern corner of 39th Avenue SE \& 5th Street SE. This easterly parcel is to comprise 45 multi-family dwelling units and access is proposed via one right-in, right-out driveway extending north from 39th Avenue SE. Conceptual site plans for Parcels "D" and "E" are available in Figures 2A and 2B, respectively.

According to ITE data, Parcel "D" would generate an estimated 229 total daily trips with 19 trips occurring during the AM peak hour (6 inbound / 13 outbound) and 20 trips during the PM peak hour ( 12 inbound / 8 outbound). Parcel "E" would generate an estimated 204 total daily trips with 17 trips occurring during the AM peak hour ( 4 inbound / 13 outbound) and 18 trips during the PM peak hour (11 inbound / 7 outbound). Existing and forecast 2025 PM peak hour delays at the study/access intersections are shown to meet City LOS D standards, operating with LOS B or better conditions. Overall, the project was not shown to create a significant impact to the study area.

Proposed mitigation for the project is as follows:

1. Parcel " $D$ " has been designed to improve the existing sight distance deficiencies identified at both access points extending north from 39th Avenue SE (westerly Willows Shopping Center driveway and 3rd Street SE). The site has been designed to provide clear sight lines within the sight distance triangle. Final verification of sight lines will be conducted during the civil review.
2. Pay traffic impact fees as required by Puyallup. Final fees will be calculated and assessed by the City at the time of building permit issuance.

No other mitigation is recommended at this time.

DOS LAGOS APARTMENTS - PARCELS "D" \& "E" TRAFFIC IMPACT ANALYSIS

APPENDIX

# Heath \& Associates 

PO Box 397 Puyallup, WA 98371
File Name : 4506ee
Site Code : 00004506
Start Date : 10/11/2022
Page No : 1

|  | TJ Maxx Access Southbound |  |  |  | 39th Ave SE Westbound |  |  |  | KeyBank Access Northbound |  |  |  | 39th Ave SE Eastbound |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. Total |
| 04:00 PM | 30 | 0 | 6 | 36 | 6 | 65 | 3 | 74 | 4 | 0 | 2 | 6 | 2 | 84 | 5 | 91 | 207 |
| 04:15 PM | 26 | 0 | 7 | 33 | 7 | 67 | 1 | 75 | 2 | 0 | 1 | 3 | 4 | 65 | 7 | 76 | 187 |
| 04:30 PM | 37 | 0 | 8 | 45 | 5 | 55 | 2 | 62 | 4 | 1 | 3 | 8 | 5 | 60 | 27 | 92 | 207 |
| 04:45 PM | 29 | 0 | 8 | 37 | 4 | 55 | 2 | 61 | 5 | 0 | 5 | 10 | 6 | 82 | 12 | 100 | 208 |
| Total | 122 | 0 | 29 | 151 | 22 | 242 | 8 | 272 | 15 | 1 | 11 | 27 | 17 | 291 | 51 | 359 | 809 |
| 05:00 PM | 34 | 0 | 9 | 43 | 6 | 56 | 1 | 63 | 4 | 0 | 4 | 8 | 0 | 78 | 7 | 85 | 199 |
| 05:15 PM | 32 | 0 | 9 | 41 | 10 | 48 | 1 | 59 | 2 | 0 | 3 | 5 | 3 | 79 | 20 | 102 | 207 |
| 05:30 PM | 32 | 0 | 8 | 40 | 5 | 51 | 1 | 57 | 0 | 0 | 1 | 1 | 0 | 85 | 10 | 95 | 193 |
| 05:45 PM | 27 | 0 | 13 | 40 | 4 | 49 | 1 | 54 | 1 | 0 | 1 | 2 | 1 | 90 | 7 | 98 | 194 |
| Total | 125 | 0 | 39 | 164 | 25 | 204 | 4 | 233 | 7 | 0 | 9 | 16 | 4 | 332 | 44 | 380 | 793 |
| Grand Total | 247 | 0 | 68 | 315 | 47 | 446 | 12 | 505 | 22 | 1 | 20 | 43 | 21 | 623 | 95 | 739 | 1602 |
| Apprch \% | 78.4 | 0 | 21.6 |  | 9.3 | 88.3 | 2.4 |  | 51.2 | 2.3 | 46.5 |  | 2.8 | 84.3 | 12.9 |  |  |
| Total \% | 15.4 | 0 | 4.2 | 19.7 | 2.9 | 27.8 | 0.7 | 31.5 | 1.4 | 0.1 | 1.2 | 2.7 | 1.3 | 38.9 | 5.9 | 46.1 |  |
| Passenger + | 246 | 0 | 68 | 314 | 46 | 435 | 12 | 493 | 22 | 1 | 20 | 43 | 21 | 619 | 94 | 734 | 1584 |
| \% Passenger + | 99.6 | 0 | 100 | 99.7 | 97.9 | 97.5 | 100 | 97.6 | 100 | 100 | 100 | 100 | 100 | 99.4 | 98.9 | 99.3 | 98.9 |
| Heavy | 1 | 0 | 0 | 1 | 1 | 11 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 5 | 18 |
| \% Heavy | 0.4 | 0 | 0 | 0.3 | 2.1 | 2.5 | 0 | 2.4 | 0 | 0 | 0 | 0 | 0 | 0.6 | 1.1 | 0.7 | 1.1 |

# Heath \& Associates 

PO Box 397 Puyallup, WA 98371
File Name : 4506ee
Site Code : 00004506
Start Date : 10/11/2022
Page No : 2

|  | TJ Maxx Access Southbound |  |  |  | 39th Ave SE <br> Westbound |  |  |  | KeyBank Access Northbound |  |  |  | 39th Ave SE Eastbound |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Peak Hour for | Entire | ntersec | on Be | gins at 0 | :30 PM |  |  |  |  |  |  |  |  |  |  |  |  |
| 04:30 PM | 37 | 0 | 8 | 45 | 5 | 55 | 2 | 62 | 4 | 1 | 3 | 8 | 5 | 60 | 27 | 92 | 207 |
| 04:45 PM | 29 | 0 | 8 | 37 | 4 | 55 | 2 | 61 | 5 | 0 | 5 | 10 | 6 | 82 | 12 | 100 | 208 |
| 05:00 PM | 34 | 0 | 9 | 43 | 6 | 56 | 1 | 63 | 4 | 0 | 4 | 8 | 0 | 78 | 7 | 85 | 199 |
| 05:15 PM | 32 | 0 | 9 | 41 | 10 | 48 | 1 | 59 | 2 | 0 | 3 | 5 | 3 | 79 | 20 | 102 | 207 |
| Total Volume | 132 | 0 | 34 | 166 | 25 | 214 | 6 | 245 | 15 | 1 | 15 | 31 | 14 | 299 | 66 | 379 | 821 |
| \% App. Total | 79.5 | 0 | 20.5 |  | 10.2 | 87.3 | 2.4 |  | 48.4 | 3.2 | 48.4 |  | 3.7 | 78.9 | 17.4 |  |  |
| PHF | . 892 | . 000 | . 944 | . 922 | . 625 | . 955 | . 750 | . 972 | . 750 | . 250 | . 750 | . 775 | . 583 | . 912 | . 611 | . 929 | . 987 |
| Passenger + | 131 | 0 | 34 | 165 | 25 | 209 | 6 | 240 | 15 | 1 | 15 | 31 | 14 | 297 | 65 | 376 | 812 |
| \% Passenger + | 99.2 | 0 | 100 | 99.4 | 100 | 97.7 | 100 | 98.0 | 100 | 100 | 100 | 100 | 100 | 99.3 | 98.5 | 99.2 | 98.9 |
| Heavy | 1 | 0 | 0 | 1 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | 9 |
| \% Heavy | 0.8 | 0 | 0 | 0.6 | 0 | 2.3 | 0 | 2.0 | 0 | 0 | 0 | 0 | 0 | 0.7 | 1.5 | 0.8 | 1.1 |



## Heath \& Associates

PO Box 397 Puyallup, WA 98371
File Name : 4506ff
Site Code : 00004506
Start Date : 10/11/2022
Page No : 1

|  | 3rd St SE <br> Southbound |  |  |  | 39th Ave SE <br> Westbound |  |  |  | South Driveway Northbound |  |  |  | 39th Ave SE Eastbound |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. Total |
| 04:00 PM | 1 | 0 | 0 | 1 | 2 | 84 | 4 | 90 | 11 | 0 | 4 | 15 | 6 | 90 | 2 | 98 | 204 |
| 04:15 PM | 1 | 0 | 2 | 3 | 0 | 84 | 5 | 89 | 9 | 0 | 4 | 13 | 3 | 72 | 0 | 75 | 180 |
| 04:30 PM | 2 | 0 | 3 | 5 | 0 | 74 | 5 | 79 | 1 | 4 | 4 | 9 | 1 | 69 | 0 | 70 | 163 |
| 04:45 PM | 3 | 0 | 1 | 4 | 0 | 74 | 3 | 77 | 4 | 3 | 4 | 11 | 4 | 92 | 1 | 97 | 189 |
| Total | 7 | 0 | 6 | 13 | 2 | 316 | 17 | 335 | 25 | 7 | 16 | 48 | 14 | 323 | 3 | 340 | 736 |
| 05:00 PM | 0 | 1 | 1 | 2 | 0 | 76 | 5 | 81 | 4 | 0 | 3 | 7 | 6 | 87 | 0 | 93 | 183 |
| 05:15 PM | 2 | 2 | 2 | 6 | 0 | 70 | 4 | 74 | 10 | 2 | 6 | 18 | 2 | 88 | 2 | 92 | 190 |
| 05:30 PM | 2 | 1 | 2 | 5 | 0 | 65 | 0 | 65 | 12 | 0 | 3 | 15 | 1 | 93 | 1 | 95 | 180 |
| 05:45 PM | 3 | 1 | 2 | 6 | 0 | 68 | 2 | 70 | 4 | 1 | 6 | 11 | 4 | 103 | 0 | 107 | 194 |
| Total | 7 | 5 | 7 | 19 | 0 | 279 | 11 | 290 | 30 | 3 | 18 | 51 | 13 | 371 | 3 | 387 | 747 |
| Grand Total | 14 | 5 | 13 | 32 | 2 | 595 | 28 | 625 | 55 | 10 | 34 | 99 | 27 | 694 | 6 | 727 | 1483 |
| Apprch \% | 43.8 | 15.6 | 40.6 |  | 0.3 | 95.2 | 4.5 |  | 55.6 | 10.1 | 34.3 |  | 3.7 | 95.5 | 0.8 |  |  |
| Total \% | 0.9 | 0.3 | 0.9 | 2.2 | 0.1 | 40.1 | 1.9 | 42.1 | 3.7 | 0.7 | 2.3 | 6.7 | 1.8 | 46.8 | 0.4 | 49 |  |
| Passenger + | 14 | 5 | 13 | 32 | 2 | 583 | 28 | 613 | 54 | 10 | 34 | 98 | 27 | 689 | 6 | 722 | 1465 |
| \% Passenger + | 100 | 100 | 100 | 100 | 100 | 98 | 100 | 98.1 | 98.2 | 100 | 100 | 99 | 100 | 99.3 | 100 | 99.3 | 98.8 |
| Heavy | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 12 | 1 | 0 | 0 | 1 | 0 | 5 | 0 | 5 | 18 |
| \% Heavy | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1.9 | 1.8 | 0 | 0 | 1 | 0 | 0.7 | 0 | 0.7 | 1.2 |

# Heath \& Associates 

PO Box 397 Puyallup, WA 98371
File Name : 4506ff
Site Code : 00004506
Start Date : 10/11/2022
Page No : 2

|  | 3rd St SE Southbound |  |  |  | 39th Ave SE <br> Westbound |  |  |  | South Driveway Northbound |  |  |  | 39th Ave SE Eastbound |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Peak Hour for Entire Intersection Begins at 05:00 PM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 05:00 PM | 0 | 1 | 1 | 2 | 0 | 76 | 5 | 81 | 4 | 0 | 3 | 7 | 6 | 87 | 0 | 93 | 183 |
| 05:15 PM | 2 | 2 | 2 | 6 | 0 | 70 | 4 | 74 | 10 | 2 | 6 | 18 | 2 | 88 | 2 | 92 | 190 |
| 05:30 PM | 2 | 1 | 2 | 5 | 0 | 65 | 0 | 65 | 12 | 0 | 3 | 15 | 1 | 93 | 1 | 95 | 180 |
| 05:45 PM | 3 | 1 | 2 | 6 | 0 | 68 | 2 | 70 | 4 | 1 | 6 | 11 | 4 | 103 | 0 | 107 | 194 |
| Total Volume | 7 | 5 | 7 | 19 | 0 | 279 | 11 | 290 | 30 | 3 | 18 | 51 | 13 | 371 | 3 | 387 | 747 |
| \% App. Total | 36.8 | 26.3 | 36.8 |  | 0 | 96.2 | 3.8 |  | 58.8 | 5.9 | 35.3 |  | 3.4 | 95.9 | 0.8 |  |  |
| PHF | . 583 | . 625 | . 875 | . 792 | . 000 | . 918 | . 550 | . 895 | . 625 | . 375 | . 750 | . 708 | . 542 | . 900 | . 375 | . 904 | . 963 |
| Passenger + | 7 | 5 | 7 | 19 | 0 | 275 | 11 | 286 | 30 | 3 | 18 | 51 | 13 | 370 | 3 | 386 | 742 |
| \% Passenger + | 100 | 100 | 100 | 100 | 0 | 98.6 | 100 | 98.6 | 100 | 100 | 100 | 100 | 100 | 99.7 | 100 | 99.7 | 99.3 |
| Heavy | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 5 |
| \% Heavy | 0 | 0 | 0 | 0 | 0 | 1.4 | 0 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0.3 | 0 | 0.3 | 0.7 |



# Heath \& Associates 

PO Box 397 Puyallup, WA 98371
File Name : 4506gg
Site Code : 00004506
Start Date : 10/11/2022
Page No : 1

|  | 5th St SE Southbound |  |  |  | 39th Ave SE <br> Westbound |  |  |  | 5th St SE Northbound |  |  |  | 39th Ave SE Eastbound |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. Total |
| 04:00 PM | 19 | 112 | 0 | 131 | 0 | 36 | 15 | 51 | 8 | 56 | 17 | 81 | 41 | 34 | 23 | 98 | 361 |
| 04:15 PM | 22 | 138 | 3 | 163 | 0 | 41 | 17 | 58 | 7 | 55 | 13 | 75 | 34 | 34 | 23 | 91 | 387 |
| 04:30 PM | 18 | 136 | 2 | 156 | 2 | 36 | 15 | 53 | 10 | 55 | 12 | 77 | 30 | 38 | 28 | 96 | 382 |
| 04:45 PM | 11 | 140 | 2 | 153 | 0 | 21 | 16 | 37 | 6 | 80 | 16 | 102 | 31 | 32 | 28 | 91 | 383 |
| Total | 70 | 526 | 7 | 603 | 2 | 134 | 63 | 199 | 31 | 246 | 58 | 335 | 136 | 138 | 102 | 376 | 1513 |
| 05:00 PM | 24 | 126 | 0 | 150 | 0 | 33 | 21 | 54 | 10 | 65 | 18 | 93 | 30 | 35 | 21 | 86 | 383 |
| 05:15 PM | 17 | 151 | 0 | 168 | 1 | 30 | 12 | 43 | 5 | 57 | 11 | 73 | 38 | 38 | 18 | 94 | 378 |
| 05:30 PM | 15 | 135 | 1 | 151 | 1 | 17 | 12 | 30 | 11 | 59 | 18 | 88 | 42 | 41 | 30 | 113 | 382 |
| 05:45 PM | 19 | 132 | 1 | 152 | 1 | 16 | 6 | 23 | 5 | 58 | 15 | 78 | 42 | 32 | 26 | 100 | 353 |
| Total | 75 | 544 | 2 | 621 | 3 | 96 | 51 | 150 | 31 | 239 | 62 | 332 | 152 | 146 | 95 | 393 | 1496 |
| Grand Total | 145 | 1070 | 9 | 1224 | 5 | 230 | $114$ | 349 | 62 | 485 | 120 | 667 | 288 | 284 | $197$ | 769 | 3009 |
| Apprch \% | 11.8 | 87.4 | 0.7 |  | 1.4 | 65.9 | 32.7 |  | 9.3 | 72.7 | 18 |  | 37.5 | $36.9$ | 25.6 |  |  |
| Total \% | 4.8 | 35.6 | 0.3 | 40.7 | 0.2 | 7.6 | 3.8 | 11.6 | 2.1 | 16.1 | 4 | 22.2 | 9.6 | 9.4 | 6.5 | 25.6 |  |
| Passenger + | 142 | 1069 | 8 | 1219 | 5 | 222 | 113 | 340 | 62 | 481 | 119 | 662 | 288 | 281 | 195 | 764 | 2985 |
| \% Passenger + | 97.9 | 99.9 | 88.9 | 99.6 | 100 | 96.5 | 99.1 | 97.4 | 100 | 99.2 | 99.2 | 99.3 | 100 | 98.9 | 99 | 99.3 | 99.2 |
| Heavy | 3 | 1 | 1 | 5 | 0 | 8 | 1 | 9 | 0 | 4 | 1 | 5 | 0 | 3 | 2 | 5 | 24 |
| \% Heavy | 2.1 | 0.1 | 11.1 | 0.4 | 0 | 3.5 | 0.9 | 2.6 | 0 | 0.8 | 0.8 | 0.7 | 0 | 1.1 | 1 | 0.7 | 0.8 |

# Heath \& Associates 

PO Box 397 Puyallup, WA 98371
File Name : 4506gg
Site Code : 00004506
Start Date : 10/11/2022
Page No : 2

|  | 5th St SE Southbound |  |  |  | 39th Ave SE Westbound |  |  |  | 5th St SE Northbound |  |  |  | 39th Ave SE Eastbound |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Peak Hour for Entire Intersection Begins at 04:15 PM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 04:15 PM | 22 | 138 | 3 | 163 | 0 | 41 | 17 | 58 | 7 | 55 | 13 | 75 | 34 | 34 | 23 | 91 | 387 |
| 04:30 PM | 18 | 136 | 2 | 156 | 2 | 36 | 15 | 53 | 10 | 55 | 12 | 77 | 30 | 38 | 28 | 96 | 382 |
| 04:45 PM | 11 | 140 | 2 | 153 | 0 | 21 | 16 | 37 | 6 | 80 | 16 | 102 | 31 | 32 | 28 | 91 | 383 |
| 05:00 PM | 24 | 126 | 0 | 150 | 0 | 33 | 21 | 54 | 10 | 65 | 18 | 93 | 30 | 35 | 21 | 86 | 383 |
| Total Volume | 75 | 540 | 7 | 622 | 2 | 131 | 69 | 202 | 33 | 255 | 59 | 347 | 125 | 139 | 100 | 364 | 1535 |
| \% App. Total | 12.1 | 86.8 | 1.1 |  | 1 | 64.9 | 34.2 |  | 9.5 | 73.5 | 17 |  | 34.3 | 38.2 | 27.5 |  |  |
| PHF | . 781 | . 964 | . 583 | . 954 | . 250 | . 799 | . 821 | . 871 | . 825 | . 797 | . 819 | . 850 | . 919 | . 914 | . 893 | . 948 | . 992 |
| Passenger + | 73 | 539 | 6 | 618 | 2 | 126 | 68 | 196 | 33 | 252 | 59 | 344 | 125 | 136 | 98 | 359 | 1517 |
| \% Passenger + | 97.3 | 99.8 | 85.7 | 99.4 | 100 | 96.2 | 98.6 | 97.0 | 100 | 98.8 | 100 | 99.1 | 100 | 97.8 | 98.0 | 98.6 | 98.8 |
| Heavy | 2 | 1 | 1 | 4 | 0 | 5 | 1 | 6 | 0 | 3 | 0 | 3 | 0 | 3 | 2 | 5 | 18 |
| \% Heavy | 2.7 | 0.2 | 14.3 | 0.6 | 0 | 3.8 | 1.4 | 3.0 | 0 | 1.2 | 0 | 0.9 | 0 | 2.2 | 2.0 | 1.4 | 1.2 |



## Multifamily Housing (Mid-Rise) <br> Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

## Setting/Location: General Urban/Suburban

Number of Studies: 11
Avg. Num. of Dwelling Units: 201
Directional Distribution: 50\% entering, 50\% exiting
Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
| :---: | :---: | :---: |
| 4.54 | $3.76-5.40$ | 0.51 |

Data Plot and Equation


## Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 30
Avg. Num. of Dwelling Units: 173
Directional Distribution: 23\% entering, 77\% exiting
Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
| :---: | :---: | :---: |
| 0.37 | $0.15-0.53$ | 0.09 |

Data Plot and Equation


## Multifamily Housing (Mid-Rise) <br> Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units
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: 31
Avg. Num. of Dwelling Units: 169
Directional Distribution: 61\% entering, 39\% exiting
Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
| :---: | :---: | :---: |
| 0.39 | $0.19-0.57$ | 0.08 |

Data Plot and Equation


## Small Office Building

(712)

## Vehicle Trip Ends vs: 1000 Sq. Ft. GFA <br> On a: Weekday

## Setting/Location: General Urban/Suburban

Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 50\% entering, 50\% exiting
Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
| :---: | :---: | :---: |
| 14.39 | $4.44-50.91$ | 10.16 |

Data Plot and Equation


## Small Office Building

(712)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies:
21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 82\% entering, 18\% exiting
Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
| :---: | :---: | :---: |
| 1.67 | $0.76-4.12$ | 0.88 |

Data Plot and Equation


## Small Office Building

(712)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
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: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 34\% entering, 66\% exiting
Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
| :---: | :---: | :---: |
| 2.16 | $0.56-5.50$ | 1.26 |

Data Plot and Equation




| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh 3.3 |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ${ }^{*}$ |  |  | ${ }^{1 /}$ | 車 ${ }^{\text {a }}$ |  |  | $\uparrow$ |  | ${ }^{1 /}$ | $\uparrow$ |  |
| Traffic Vol, veh/h | 66 | 299 | 14 | 6 | 214 | 25 | 15 | 1 | 15 | 34 | 0 | 132 |
| Future Vol, veh/h | 66 | 299 | 14 | 6 | 214 | 25 | 15 | 1 | 15 | 34 | 0 | 132 |
| Conflicting Peds, \#/hr | 2 | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 75 | - | - | 75 | - | - | - | - | - | 0 | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 |
| Heavy Vehicles, \% | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mvmt Flow | 67 | 302 | 14 | 6 | 216 | 25 | 15 | 1 | 15 | 34 | 0 | 133 |





|  | $\dagger$ | $\rightarrow$ | 7 | 7 | - |  | 4 | $\dagger$ | $p$ |  | $\downarrow$ | $\checkmark$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | \% | 个 ${ }^{\text {a }}$ |  | \% | 性 |  | \% | $\uparrow$ |  | \% | $\uparrow$ |  |
| Traffic Volume (veh/h) | 100 | 139 | 125 | 69 | 131 | 2 | 59 | 255 | 33 | 7 | 540 | 75 |
| Future Volume (veh/h) | 100 | 139 | 125 | 69 | 131 | 2 | 59 | 255 | 33 | 7 | 540 | 75 |
| Initial $\mathrm{Q}(\mathrm{Qb})$, veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 0.98 |  | 0.99 | 1.00 |  | 0.97 | 1.00 |  | 1.00 | 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 | 1870 | 1870 | 1885 | 1885 | 1841 | 1885 | 1885 | 1885 | 1885 | 1693 | 1885 | 1856 |
| Adj Flow Rate, veh/h | 101 | 140 | 126 | 70 | 132 | 2 | 60 | 258 | 33 | 7 | 545 | 76 |
| 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, \% | 2 | 2 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 14 | , | 3 |
| Cap, veh/h | 382 | 278 | 231 | 316 | 493 | 7 | 324 | 760 | 97 | 499 | 679 | 95 |
| Arrive On Green | 0.07 | 0.15 | 0.15 | 0.06 | 0.14 | 0.14 | 0.05 | 0.46 | 0.46 | 0.01 | 0.42 | 0.42 |
| Sat Flow, veh/h | 1781 | 1837 | 1524 | 1795 | 3525 | 53 | 1795 | 1637 | 209 | 1612 | 1617 | 226 |
| Grp Volume(v), veh/h | 101 | 135 | 131 | 70 | 65 | 69 | 60 | 0 | 291 | 7 | 0 | 621 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1777 | 1584 | 1795 | 1749 | 1829 | 1795 | 0 | 1846 | 1612 | 0 | 1843 |
| Q Serve(g_s), s | 2.7 | 4.0 | 4.4 | 1.8 | 1.9 | 1.9 | 1.0 | 0.0 | 5.7 | 0.1 | 0.0 | 16.8 |
| Cycle Q Clear (g_c), s | 2.7 | 4.0 | 4.4 | 1.8 | 1.9 | 1.9 | 1.0 | 0.0 | 5.7 | 0.1 | 0.0 | 16.8 |
| Prop In Lane | 1.00 |  | 0.96 | 1.00 |  | 0.03 | 1.00 |  | 0.11 | 1.00 |  | 0.12 |
| Lane Grp Cap (c), veh/h | 382 | 269 | 240 | 316 | 245 | 256 | 324 | 0 | 857 | 499 | 0 | 774 |
| V/C Ratio(X) | 0.26 | 0.50 | 0.55 | 0.22 | 0.27 | 0.27 | 0.19 | 0.00 | 0.34 | 0.01 | 0.00 | 0.80 |
| Avail Cap(c_a), veh/h | 774 | 890 | 793 | 478 | 630 | 659 | 464 | 0 | 2872 | 668 | 0 | 2834 |
| 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(l) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 18.9 | 22.2 | 22.3 | 19.1 | 21.9 | 21.9 | 10.8 | 0.0 | 9.7 | 9.4 | 0.0 | 14.4 |
| Incr Delay (d2), s/veh | 0.4 | 1.5 | 1.9 | 0.4 | 0.6 | 0.6 | 0.3 | 0.0 | 0.2 | 0.0 | 0.0 | 2.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| \%ile BackOfQ(50\%),veh/ln | 1.0 | 1.6 | 1.6 | 0.7 | 0.8 | 0.8 | 0.4 | 0.0 | 2.0 | 0.0 | 0.0 | 6.3 |
| Unsig. Movement Delay, s/veh |  |  |  |  |  |  |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh | 19.2 | 23.6 | 24.3 | 19.5 | 22.4 | 22.4 | 11.1 | 0.0 | 9.9 | 9.4 | 0.0 | 16.4 |
| LnGrp LOS | B | C | C | B | C | C | B | A | A | A | A | B |
| Approach Vol, veh/h |  | 367 |  |  | 204 |  |  | 351 |  |  | 628 |  |
| Approach Delay, s/veh |  | 22.7 |  |  | 21.4 |  |  | 10.1 |  |  | 16.4 |  |
| Approach LOS |  | C |  |  | C |  |  | B |  |  | B |  |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |  |  |  |  |
| Phs Duration ( $\mathrm{G}+\mathrm{Y}+\mathrm{Rc}$ ), s | 5.0 | 30.9 | 7.8 | 13.1 | 7.6 | 28.4 | 8.5 | 12.5 |  |  |  |  |
| Change Period ( $Y+R \mathrm{C}$ ), s | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |  |  |  |  |
| Max Green Setting (Gmax), s | 6.5 | 88.5 | 8.5 | 28.5 | 7.5 | 87.5 | 16.5 | 20.5 |  |  |  |  |
| Max Q Clear Time (g_c+1), s | 2.1 | 7.7 | 3.8 | 6.4 | 3.0 | 18.8 | 4.7 | 3.9 |  |  |  |  |
| Green Ext Time (p_c), s | 0.0 | 2.0 | 0.0 | 1.5 | 0.0 | 5.1 | 0.2 | 0.5 |  |  |  |  |
| Intersection Summary |  |  |  |  |  |  |  |  |  |  |  |  |
| HCM 6th Ctrr DelayHCM 6th LOS |  |  | 17.1 |  |  |  |  |  |  |  |  |  |
|  |  |  | B |  |  |  |  |  |  |  |  |  |


| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 3.2 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ${ }^{*}$ | 中 ${ }^{\text {a }}$ |  | ${ }^{1}$ | 蚛 |  |  | $\$$ |  | ${ }^{1}$ | $\uparrow$ |  |
| Traffic Vol, veh/h | 70 | 327 | 15 | 6 | 228 | 27 | 16 | 1 | 16 | 36 | 0 | 140 |
| Future Vol, veh/h | 70 | 327 | 15 | 6 | 228 | 27 | 16 | 1 | 16 | 36 | 0 | 140 |
| Conflicting Peds, \#/hr | 2 | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 75 | - | - | 75 | - | - | - | - | - | 0 | - | - |
| Veh in Median Storage, \# | \# - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 |
| Heavy Vehicles, \% | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mvmt Flow | 71 | 330 | 15 | 6 | 230 | 27 | 16 | 1 | 16 | 36 | 0 | 141 |



| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh | 1.3 |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ${ }^{1 /}$ | 㻢 |  | ${ }^{7}$ | 中 ${ }^{\text {a }}$ |  |  | $\uparrow$ |  |  | * |  |
| Traffic Vol, veh/h | 3 | 402 | 16 | 13 | 296 | 0 | 20 | 3 | 33 | 7 | 5 | 7 |
| Future Vol, veh/h | 3 | 402 | 16 | 13 | 296 | 0 | 20 | 3 | 33 | 7 | 5 | 7 |
| Conflicting Peds, \#/hr | 2 | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 75 | - | - | 75 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, \% | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mvmt Flow | 3 | 419 | 17 | 14 | 308 | 0 | 21 | 3 | 34 | 7 | 5 | 7 |



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |


| Intersection |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Int Delay, s/veh 3.3 |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ${ }^{*}$ | 中 ${ }^{\text {a }}$ |  | ${ }^{1 /}$ | 車 ${ }^{\text {a }}$ |  |  | $\uparrow$ |  | ${ }^{1 /}$ | $\uparrow$ |  |
| Traffic Vol, veh/h | 74 | 332 | 15 | 6 | 236 | 27 | 16 | 1 | 16 | 36 | 0 | 143 |
| Future Vol, veh/h | 74 | 332 | 15 | 6 | 236 | 27 | 16 | 1 | 16 | 36 | 0 | 143 |
| Conflicting Peds, \#/hr | 2 | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 2 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 75 | - | - | 75 | - | - | - | - | - | 0 | - | - |
| Veh in Median Storage, \# | \# | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, \% | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 |
| Heavy Vehicles, \% | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mvmt Flow | 75 | 335 | 15 | 6 | 238 | 27 | 16 | 1 | 16 | 36 | 0 | 144 |





|  | $\Rightarrow$ | $\rightarrow$ | 7 | 7 | - | 4 | 4 | 4 | $p$ |  | $\downarrow$ | $\downarrow$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | \% | $\uparrow$ |  | \% | 中 ${ }_{6}$ |  | \% | $\uparrow$ |  | \% | ¢ |  |
| Traffic Volume (veh/h) | 108 | 149 | 141 | 74 | 141 | 2 | 66 | 271 | 35 | 7 | 575 | 90 |
| Future Volume (veh/h) | 108 | 149 | 141 | 74 | 141 | 2 | 66 | 271 | 35 | 7 | 575 | 90 |
| Initial $Q(Q b)$, veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 0.98 |  | 0.99 | 1.00 |  | 0.97 | 1.00 |  | 1.00 | 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 | 1870 | 1870 | 1885 | 1885 | 1841 | 1885 | 1885 | 1885 | 1885 | 1693 | 1885 | 1856 |
| Adj Flow Rate, veh/h | 109 | 151 | 142 | 75 | 142 | 2 | 67 | 274 | 35 | 7 | 581 | 91 |
| 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, \% | 2 | 2 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 14 | 1 | 3 |
| Cap, veh/h | 372 | 278 | 242 | 296 | 494 | 7 | 310 | 802 | 102 | 504 | 706 | 111 |
| Arrive On Green | 0.07 | 0.15 | 0.15 | 0.06 | 0.14 | 0.14 | 0.05 | 0.49 | 0.49 | 0.01 | 0.44 | 0.44 |
| Sat Flow, veh/h | 1781 | 1795 | 1560 | 1795 | 3529 | 50 | 1795 | 1637 | 209 | 1612 | 1590 | 249 |
| Grp Volume(v), veh/h | 109 | 149 | 144 | 75 | 70 | 74 | 67 | 0 | 309 | 7 | 0 | 672 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1777 | 1578 | 1795 | 1749 | 1830 | 1795 | 0 | 1846 | 1612 | 0 | 1839 |
| Q Serve(g_s), s | 3.2 | 4.9 | 5.3 | 2.2 | 2.3 | 2.3 | 1.2 | 0.0 | 6.4 | 0.1 | 0.0 | 20.0 |
| Cycle Q Clear(g_c), s | 3.2 | 4.9 | 5.3 | 2.2 | 2.3 | 2.3 | 1.2 | 0.0 | 6.4 | 0.1 | 0.0 | 20.0 |
| Prop In Lane | 1.00 |  | 0.99 | 1.00 |  | 0.03 | 1.00 |  | 0.11 | 1.00 |  | 0.14 |
| Lane Grp Cap (c), veh/h | 372 | 275 | 244 | 296 | 245 | 256 | 310 | 0 | 905 | 504 | 0 | 817 |
| V/C Ratio(X) | 0.29 | 0.54 | 0.59 | 0.25 | 0.29 | 0.29 | 0.22 | 0.00 | 0.34 | 0.01 | 0.00 | 0.82 |
| Avail Cap(c_a), veh/h | 711 | 810 | 719 | 436 | 573 | 600 | 426 | 0 | 2612 | 657 | 0 | 2572 |
| 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(l) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 20.7 | 24.4 | 24.6 | 21.1 | 24.1 | 24.1 | 11.6 | 0.0 | 9.8 | 9.5 | 0.0 | 15.2 |
| Incr Delay (d2), s/veh | 0.4 | 1.7 | 2.2 | 0.4 | 0.6 | 0.6 | 0.3 | 0.0 | 0.2 | 0.0 | 0.0 | 2.2 |
| 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(50\%),veh/ln | 1.3 | 2.0 | 2.0 | 0.9 | 0.9 | 1.0 | 0.4 | 0.0 | 2.3 | 0.0 | 0.0 | 7.7 |
| Unsig. Movement Delay, s/veh |  |  |  |  |  |  |  |  |  |  |  |  |
| LnGrp Delay(d),s/veh | 21.1 | 26.1 | 26.8 | 21.6 | 24.7 | 24.7 | 11.9 | 0.0 | 10.0 | 9.5 | 0.0 | 17.4 |
| LnGrp LOS | C | C | C | C | C | C | B | A | A | A | A | B |
| Approach Vol, veh/h |  | 402 |  |  | 219 |  |  | 376 |  |  | 679 |  |
| Approach Delay, s/veh |  | 25.0 |  |  | 23.7 |  |  | 10.3 |  |  | 17.3 |  |
| Approach LOS |  | C |  |  | C |  |  | B |  |  | B |  |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |  |  |  |  |
| Phs Duration ( $\mathrm{G}+\mathrm{Y}+\mathrm{Rc}$ ), s | 5.1 | 35.2 | 8.1 | 14.2 | 7.9 | 32.3 | 9.1 | 13.3 |  |  |  |  |
| Change Period ( $Y+R \mathrm{Rc}$ ), s | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |  |  |  |  |
| Max Green Setting (Gmax), s | 6.5 | 88.5 | 8.5 | 28.5 | 7.5 | 87.5 | 16.5 | 20.5 |  |  |  |  |
| Max Q Clear Time (g_c+11), s | 2.1 | 8.4 | 4.2 | 7.3 | 3.2 | 22.0 | 5.2 | 4.3 |  |  |  |  |
| Green Ext Time (p_c), s | 0.0 | 2.1 | 0.0 | 1.6 | 0.0 | 5.8 | 0.2 | 0.6 |  |  |  |  |
| Intersection Summary |  |  |  |  |  |  |  |  |  |  |  |  |
| HCM 6th Ctrl Delay |  |  | 18.4 |  |  |  |  |  |  |  |  |  |
| HCM 6th LOS |  |  | B |  |  |  |  |  |  |  |  |  |




