

Technical Memorandum

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Baysinger Partners Architecture

From: Daniel Stumpf, PE
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Date: April 8, 2020

Subject: Youngs Bay Plaza Restaurants – Transportation Study



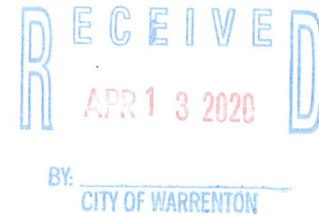

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Introduction

This memorandum reports and evaluates the transportation impacts related to three proposed restaurants located within the Youngs Bay Plaza in Warrenton, Oregon. Specifically, two of the proposed restaurants (a Quality Pizza QSR and Quality Hamburger QSR totaling 4,850 square feet) will repurpose an existing Dooger's restaurant while a proposed fast-food restaurant with a drive-through window (Quality Mexican QSR totaling 2,325 square feet) will be constructed to the northeast.

This memorandum examines the impacts of the proposed development on the nearby transportation system. Based on correspondence with City of Warrenton and Oregon Department of Transportation (ODOT) staff, the study conducts safety and capacity/level of service analyses at the following intersections:

1. SE Neptune Drive at E Harbor Drive;
2. Shopping center access intersection along E Harbor Drive;
3. Oregon Coast Highway (US-101) at E Harbor Drive; and
4. Shopping center access intersection along SE Neptune Drive.



The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses and to determine any mitigation that may be necessary to do so. In addition, an assessment of the projected queuing for the fast-food restaurant's drive-through was conducted. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report

Project Site Description

The subject site is located within the northeastern section of the Youngs Bay Plaza shopping center and includes a portion of a single tax lot, lot 800, which encompasses an approximate total of 0.9 acres. The site is currently developed as a Dooger's restaurant building and parking lot. Access between the site and the greater transportation system will be provided via the existing shopping center accesses along E Harbor Drive and



SE Neptune Drive; however, it is expected that a significant majority of site trips will utilize the E Harbor Drive access over the other access.

Vicinity Roadways

The proposed development is expected to impact three roadways near the site: US-101, SE Neptune Drive, and E Harbor Drive. Table 1 provides a description of each of the vicinity roadways.

Table 1: Vicinity Roadway Descriptions

Roadway	Jurisdiction	Functional Classification	Cross-Section	Speed	On-street Parking	Bicycle Lanes	Curbs	Sidewalks
US-101	ODOT	Principal Arterial /Statewide Hwy	2 to 3 Lanes	45/55 mph Posted	Not Permitted	Both Sides	None	None
SE Neptune Drive	City of Warrenton	Minor Collector	3 Lanes	20 mph Statutory	Not Permitted	None	Both Sides	West Side
E Harbor Drive	ODOT	Major Collector/ District Hwy	2 to 4 Lanes	35/45 mph Posted	Not Permitted	Both Sides	Partial South Side	None

Note: Jurisdiction & Functional Classification based on City of Warrenton Transportation System Plan (Volume 1 Figure 9) and ODOT Oregon Highway Plan/Oregon Transportation Map.

Vicinity Intersections

A majority of site trips generated by the proposed development are expected to impact four intersections of significance. A summarized description of these intersections is provided in Table 2.



Table 2: Study Intersection Descriptions

Number	Name	Geometry	Traffic Control	Phasing/Stopped Approaches
1	SE Neptune Drive at E Harbor Drive	Three-Legged	Stop-Controlled	Stop-Controlled NB Approach
2	Shopping Center Access at E Harbor Drive	Four-Legged	Stop-Controlled	Stop-Controlled NB/SB Approaches
3	US-101 at E Harbor Drive	Three-Legged	Signalized	Protected NB Left-turn Lane, Permitted/Overlap SB Right-turn Lane
4	Shopping Center Access at SE Neptune Drive	Four-Legged	Stop-Controlled	Stop-Controlled EB/WB Approaches

Public Transit

The project site is located near four transit lines which have a single stop along SE Neptune Drive within a quarter-mile walking/biking distance of the site.

Bus line *Route 10 – Astoria-Hammond-Warrenton* provides service between the aforementioned cities, with notable stops near Astoria Transit Center, Columbia Hospital, and Clatsop college. Weekday service is scheduled from approximately 5:45 AM to 9:15 PM and has headways of approximately 60 minutes most of the day.

Bus line *Route 15 – Warrenton-Hammond-Astoria* provides service between the aforementioned cities, with a notable stop near Astoria Transit Center. Weekly service is scheduled from approximately 8:30 AM to 7:25 PM, with limited service throughout the day. When in service, the bus line has headways of approximately 30 minutes.

Bus line *Route 101 – Astoria-Warrenton-Gearhart-Seaside* provides service between the aforementioned cities, with notable stops near Astoria Transit Center, Astoria High School, and Clatsop college. Weekday service is scheduled from approximately 6:00 AM to 9:50 PM and has headways of approximately one to two hours.

The *Pacific Connector* provides limited service between the Cities of Astoria and Cannon Beach, with stops near Warrenton, Gearhart, and Seaside. Weekend service is scheduled from approximately 8:30 AM to 8:30 PM and has headways of approximately two to three hours.

Figure 1 presents an aerial image of the nearby vicinity with the project site outlined in yellow.



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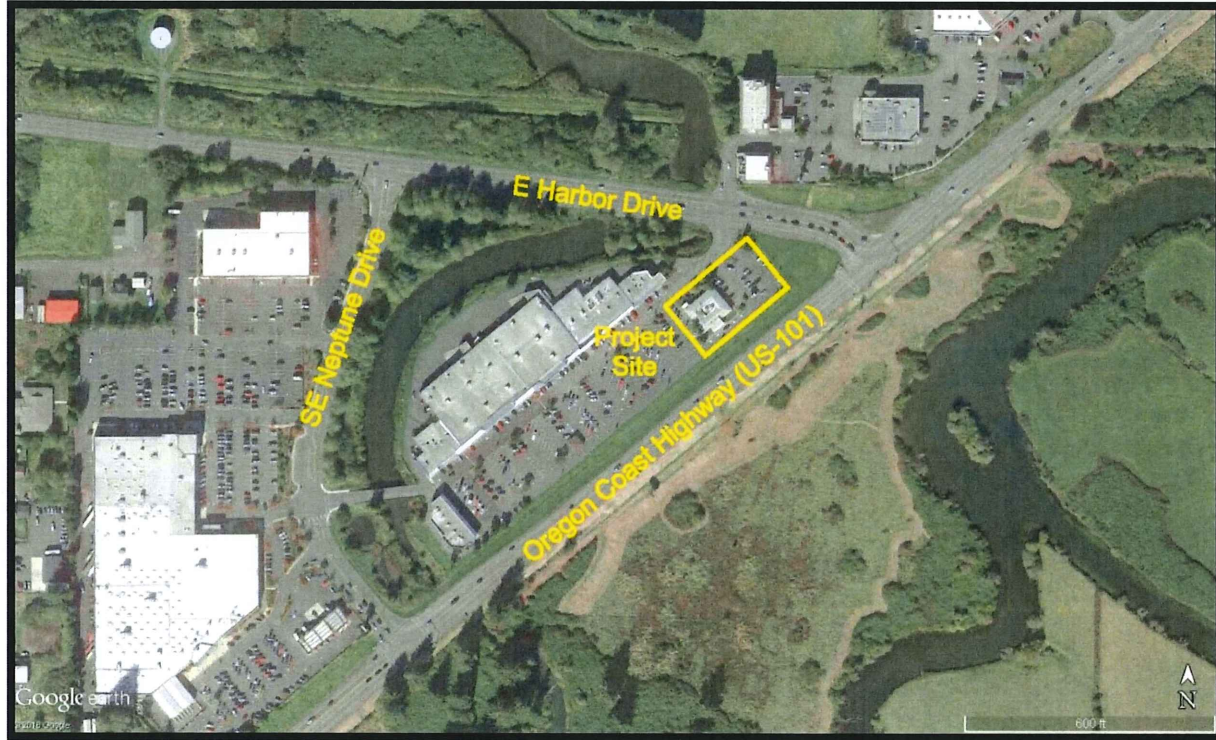


Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)



Trip Generation & Distribution

The proposed Youngs Bay Plaza restaurants will include repurposing an existing Dooger's restaurant as a Quality Hamburger QSR and Quality Pizza QSR (both existing and proposed uses each totaling 4,850 square feet) and constructing a Quality Mexican QSR restaurant with a drive-through window (new building totaling 2,325 square feet) within the parking lot to the east of the existing Dooger's restaurant building.

To estimate the number of trips that will be generated by the existing and proposed uses, trip rates from the *Trip Generation Manual*¹ were used. For the proposed Quality Mexican QSR, data from land use code 934, *Fast-Food Restaurant with a Drive-Through Window*, was used to estimate the restaurant's trip generation based on the square-footage of the gross building floor area. Based on correspondence with City of Warrenton staff, the trip generation of the existing Dooger's restaurant and the proposed hamburger and pizza restaurants will be comparable whereby no net change in trip generation associated with these uses is expected to occur.

Internal Trips

Given the close proximity of the nearby retail land uses to the project site, some trips generated from the proposed development are expected to be shared/internally captured within the shopping center and won't impact the study intersections or adjoining roadways. To determine appropriate morning and evening internal capture rates, the following rates were calculated of the proposed development using the *National Cooperative Highway Research Project's* (NCHRP) Report 684:

- Approximately 11 percent of total morning peak hour site trips are assumed to be internally captured.
- Approximately 10 percent of total evening peak hour site trips are assumed to be internally captured.
- It is assumed the average weekday internal capture rate would approximately match the evening peak hour rate.

Pass-by and Diverted Trips

The proposed Quality Mexican QSR restaurant is expected to attract pass-by and diverted trips to the site. Pass-by trips are trips that leave the adjacent roadway to patronize a land use and then continue in their original direction of travel. Similar to pass-by trips, diverted trips are trips that divert from a nearby roadway not adjacent to the site to patronize a land use before continuing to their original destination. Pass-by trips do not add additional vehicles to the surrounding transportation system; however, they do add additional turning movements at site access intersections. Diverted trips may add turning movements at both site accesses and other nearby intersections.

¹ Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10th Edition, 2017.



For the purposes of this analysis, diverted trips were treated as primary trips while pass-by trips were drawn from E Harbor Drive. Regarding pass-by trip generation, data from land use code 934 of the *Trip Generation Handbook, 3rd Edition*² was referenced. The following rates were utilized for determining pass-by trip generation during the morning and evening peak hours:

- Approximately 49 percent of morning peak hour site trips are assumed as pass-by trips.
- Approximately 50 percent of evening peak hour site trips are assumed as pass-by trips.
- It is assumed that the average weekday pass-by trip rate would approximately match the evening peak hour rate.

The trip generation calculations show that the proposed development is projected to generate 43 net new morning peak hour trips, 34 net new evening peak hour trips, and 492 net new average weekday trips. The trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included as an attachment to this study.

Table 3: Trip Generation Summary

	ITE Code	Size / Rate	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Fast-Food Restaurant with Drive-Thru	934	2,325 SF	47	46	93	40	36	76	1,094
<i>Internalization within Shopping Center</i>		11% (10%)	5	5	10	4	4	8	110
External Trips			42	41	83	36	32	68	984
<i>Pass-by Trips</i>		49% (50%)	20	20	40	17	17	34	492
Net New Primary Site Trips			22	21	43	19	15	34	492

Note: Morning peak hour, evening peak hour, and weekday rates are denoted as AM (PM/ADT).

² Institute of Transportation Engineers (ITE), *Trip Generation Handbook, 3rd Edition*, 2014.



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Trip Distribution

The directional distribution of site trips to/from the project site was estimated based on the locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and existing travel patterns at the study intersections.

The following trip distribution was estimated and used for analysis:

- Approximately 50 percent of primary site trips will travel to/from the north along US-101;
- Approximately 45 percent of primary site trips will travel to/from the west along E Harbor Drive;
and
- Approximately 5 percent of primary site trips will travel to/from the south along US-101.

Regarding access utilization, the following trip distribution was estimated:

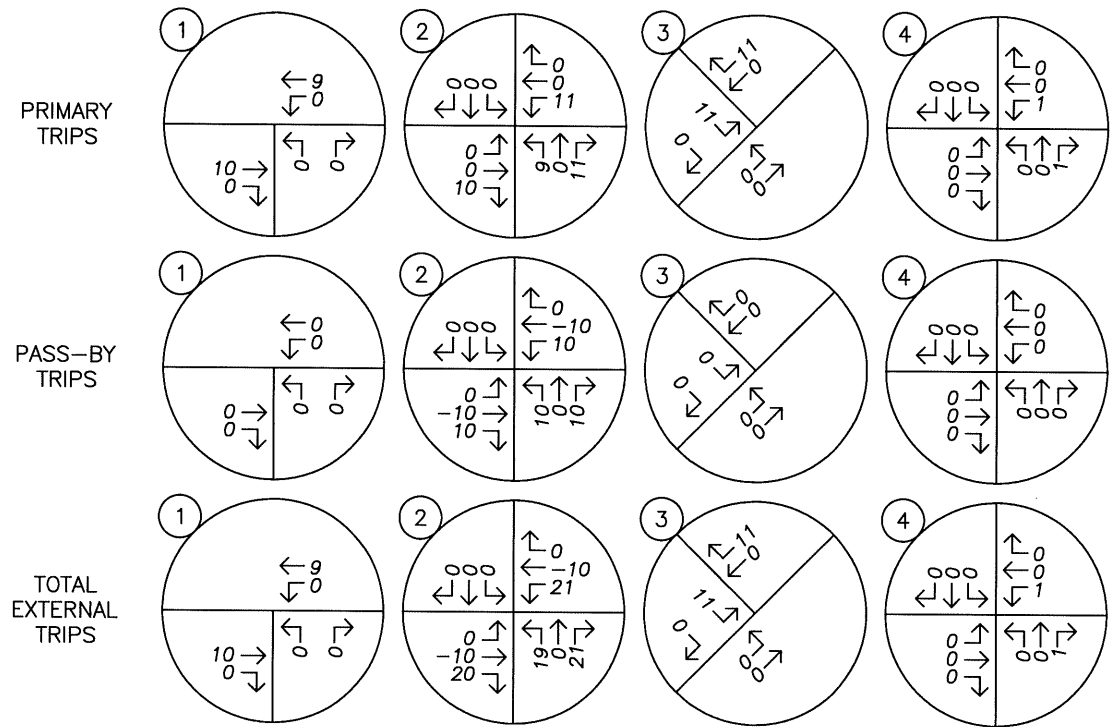
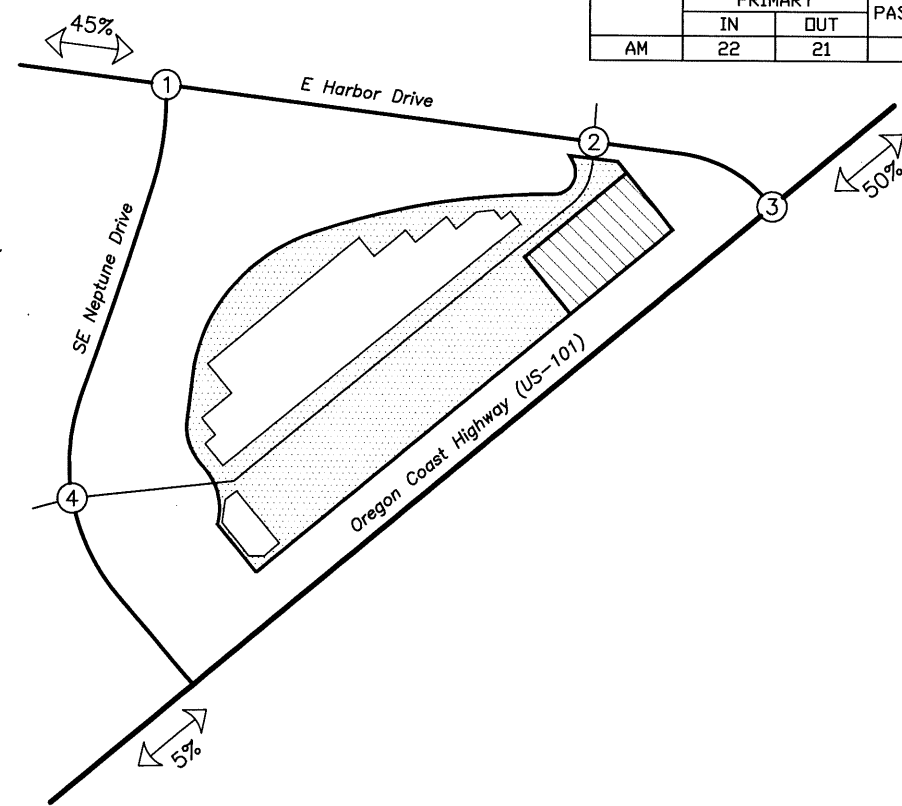
- Approximately 95 percent of primary trips and all pass-by trips will utilize the access intersection along E Harbor Street; and
- Approximately 5 percent of primary trips will utilize the access intersection along SE Neptune Drive.

The trip distribution and assignment utilized for the proposed development are shown in Figure 2 on page 8 and Figure 3 on page 9 for the morning and evening peak hours, respectively.

LEGEND

- STUDY INTERSECTION
- ▨ PROJECT SITE
- ▨ SHOPPING CENTER
- ARTERIAL ROADWAY
- COLLECTOR ROADWAY
- LOCAL/PRIVATE ROADWAY
- ↔ XX% PERCENT OF PRIMARY TRIPS

	PRIMARY		PASS-BY	TOTAL
	IN	OUT		
AM	22	21	40	83



SITE TRIP DISTRIBUTION & ASSIGNMENT
 Proposed Development Plan – Site Trips
 AM Peak Hour

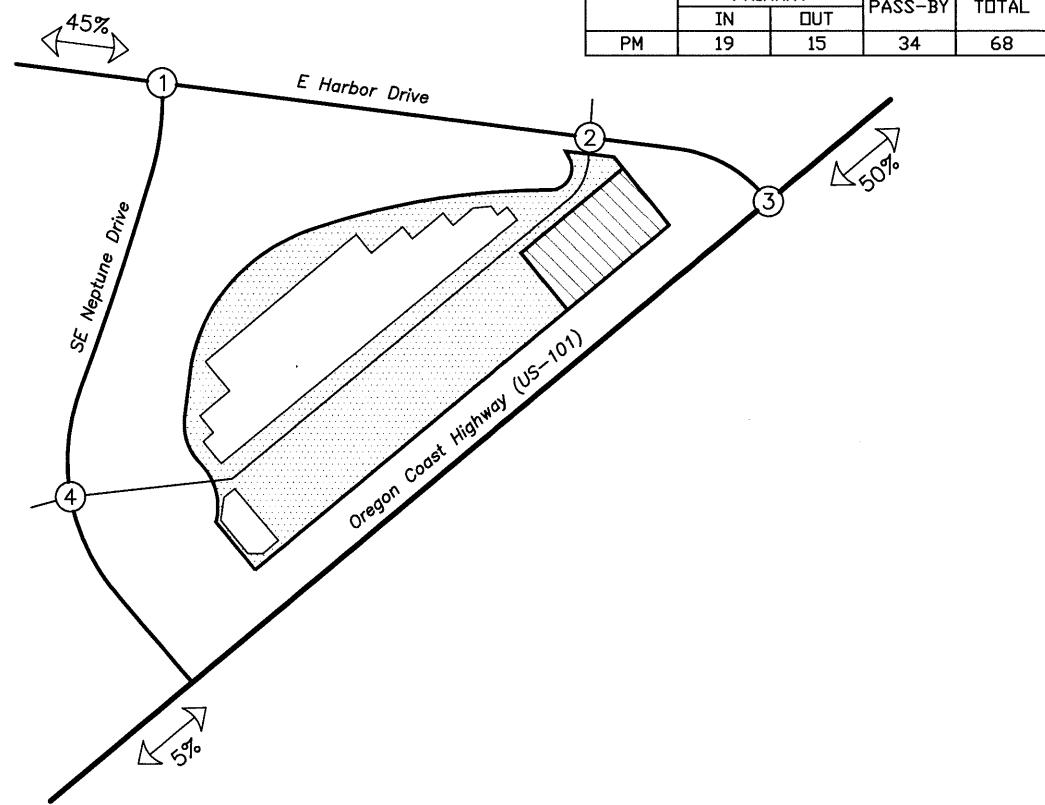


FIGURE 2

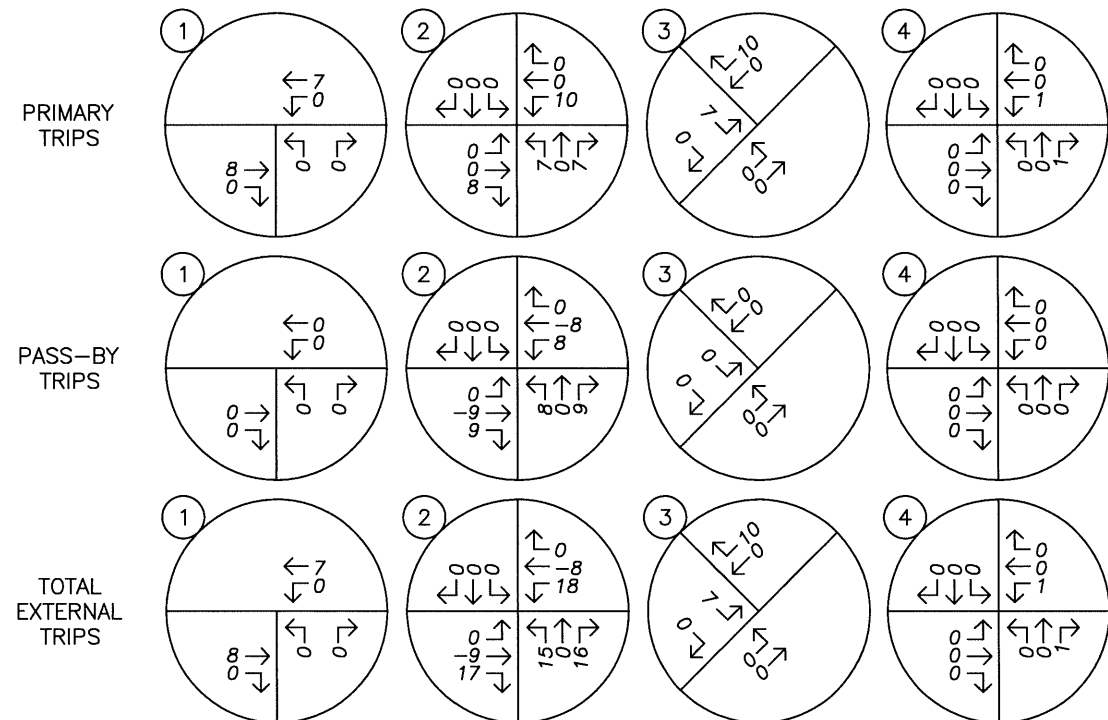
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LEGEND

- STUDY INTERSECTION
- ▨ PROJECT SITE
- ▨ SHOPPING CENTER
- ARTERIAL ROADWAY
- COLLECTOR ROADWAY
- LOCAL/PRIVATE ROADWAY
- XX% PERCENT OF PRIMARY TRIPS



TOTAL EXTERNAL TRIP GENERATION				
	PRIMARY		PASS-BY	TOTAL
	IN	OUT		
PM	19	15	34	68





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Existing Traffic Volumes

Traffic counts were conducted at the study intersections on the following dates:

- Wednesday, November 13th, 2019, from 6:00 AM to 9:00 AM and from 3:00 PM to 6:00 PM.
- Tuesday, March 17th, 2020, from 6:00 AM/7:00 AM to 9:00 AM and from 3:00 PM/4:00 PM to 6:00 PM.

Data was used from each intersections' respective morning and evening peak hours.

Traffic counts at the intersections of SE Neptune Drive at E Harbor Drive and the shopping center access intersection along SE Neptune Drive were collected on March 17th, 2020, after the Covid-19 viral pandemic had become a mainstream concern throughout the State of Oregon. Subsequently, traffic volumes had been significantly depressed statewide by mid-March. In order to reflect normal travel conditions, additional evening peak hour traffic counts were collected at the shopping center access intersection along E Harbor Drive and compared to the evening peak hour counts collected at the same intersection in November 2019, prior to the virus impacting traffic volumes. Based on a comparison of the two sets of counts, volumes at the intersection had decreased by approximately 25.5 percent. Therefore, an adjustment factor of 1.255 was applied to the traffic counts dated March 17th, 2020 to reflect traffic conditions without impacts associated with the virus.

According to the requirements established in ODOT's *Analysis Procedures Manual (APM)* as well as direction from ODOT staff, a seasonal adjustment factor was calculated and applied to each highway's through movement traffic volumes to reflect the 30th highest hour volumes along ODOT facilities. The adjustment factor was calculated based on an average of the Commuter and Coastal Destination Route seasonal trends, utilizing ODOT's *Seasonal Trend Table*.

Per the City of Warrenton's *Transportation System Plan (TSP) Update*, alternative mobility standards and methodologies for US-101 were recommended and will be presented to the Oregon Transportation Commission (OTC). One of these alternative mobility standards includes analyzing the segment of US-101 within Warrenton city limits based on the annual average weekday volumes rather than the 30th highest hour volumes. Since it is expected these alternative standards will be adopted by the OTC prior to submittal of the proposed development application, the traffic volumes for the intersection of US-101 at E Harbor Drive were adjusted to reflect the annual average weekday volumes.



The following seasonal adjustment factors were applied to each of the study intersections:

- 1.3356 for the intersection of SE Neptune Drive at E Harbor Drive;
- 1.3933 for the shopping center access intersection along E Harbor Drive; and
- 1.1050 for the intersection of US-101 at E Harbor Drive.

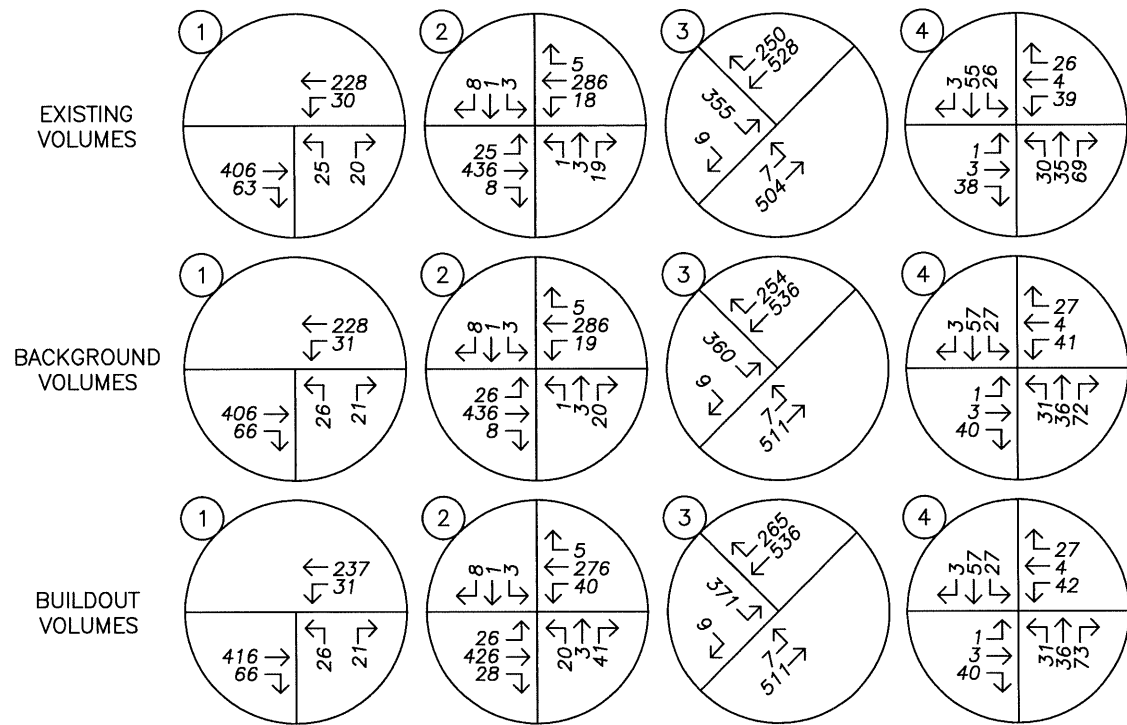
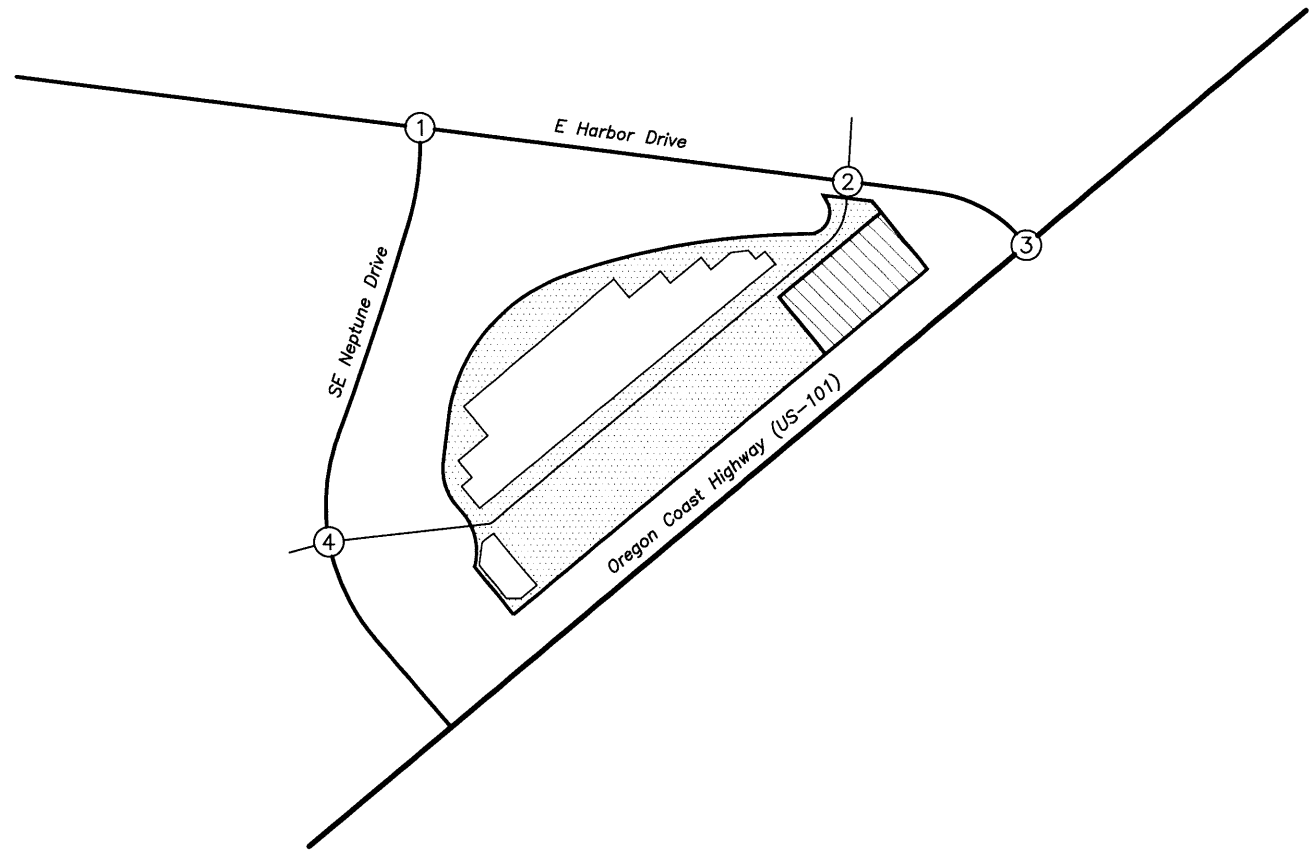
2021 Background Volumes

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. To estimate the future traffic volumes for ODOT facilities, a linear growth rate of 0.7332 percent per year and 0.0467 percent per year was calculated for the traffic volumes along US-101 and E Harbor Drive, respectively, using ODOT's *2038 Future Volumes Table*. The growth rate was applied to the measured existing volumes traveling along both roadways while a compounded growth rate of two percent per year was applied to the non-ODOT turning movement traffic volumes from the shopping center access.

2021 Buildout Volumes

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2021 background traffic volumes to obtain the expected year 2021 buildout volumes.

Figure 4 on page 12 and Figure 5 on page 13 show the existing condition, 2021 background condition, and 2021 buildout condition traffic volumes at the study intersections for the morning and evening peak hours, respectively.

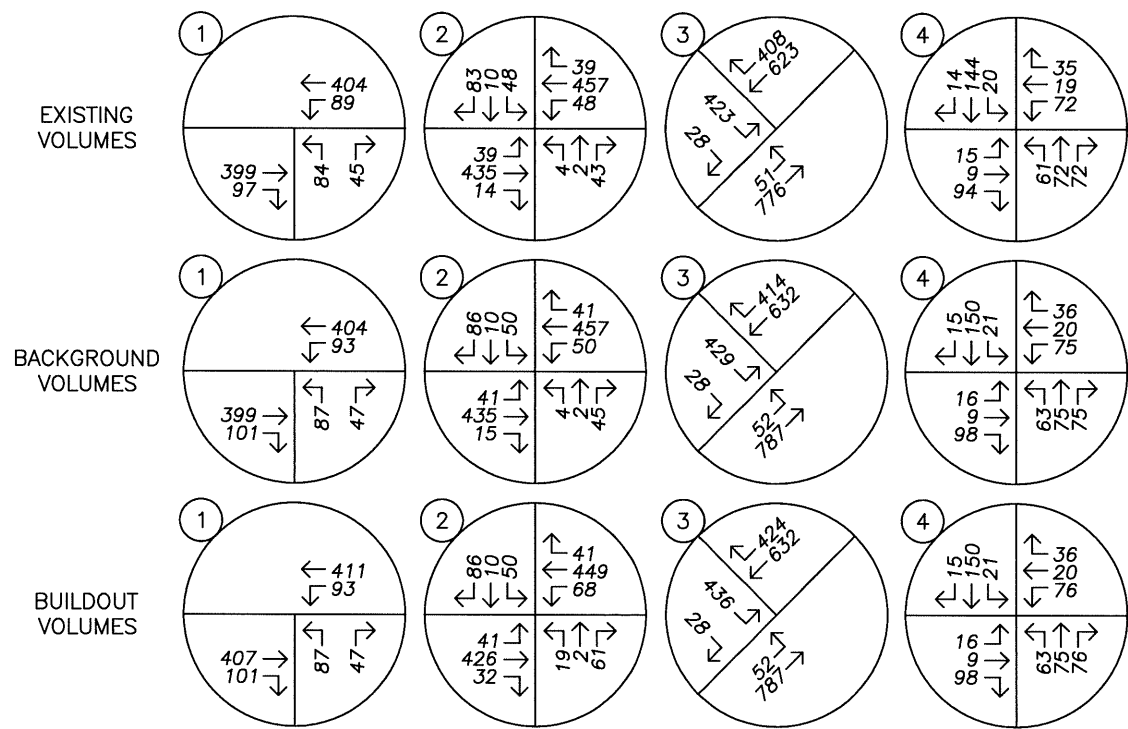
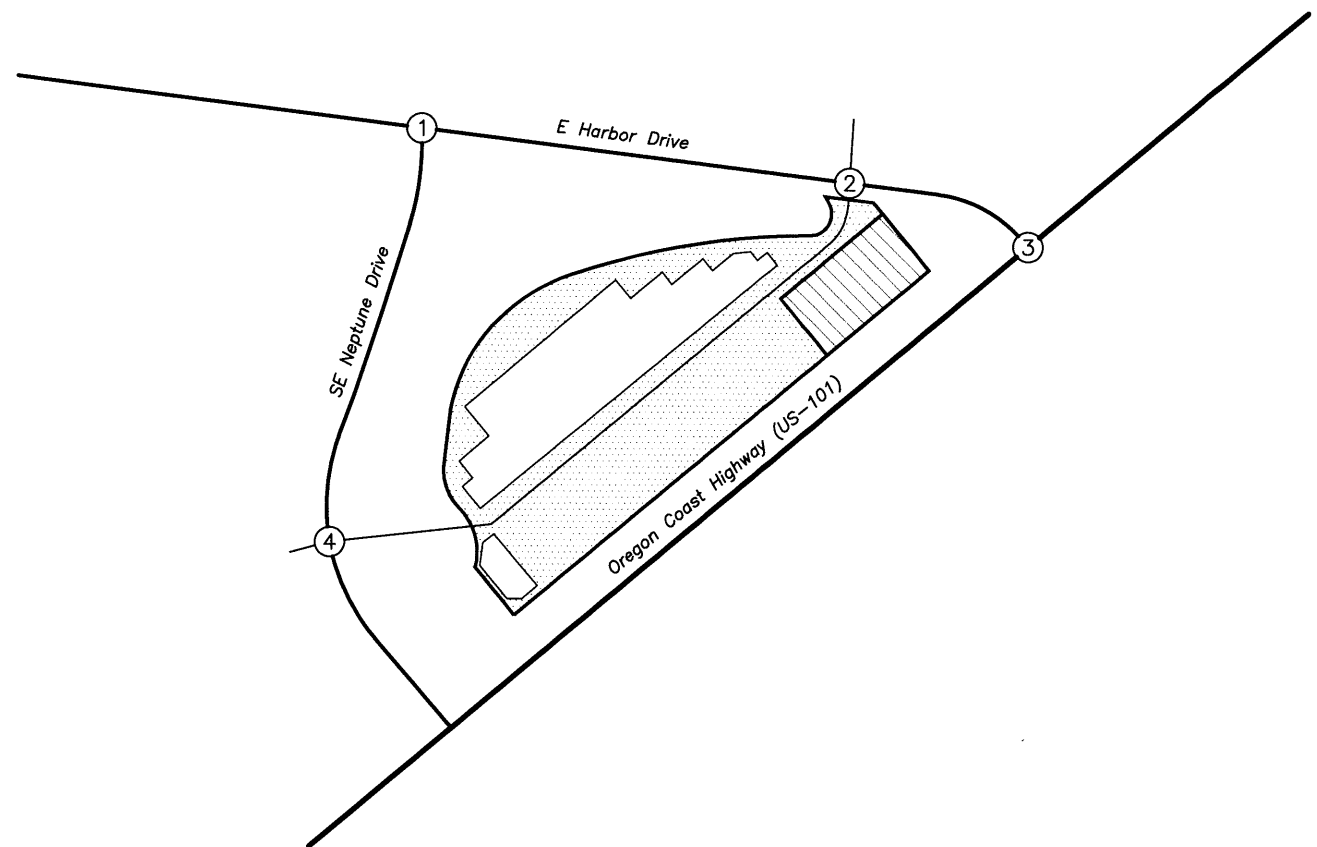


TRAFFIC VOLUMES
Existing, 2021 Background, and 2021 Buildout Conditions
AM Peak Hour



FIGURE
4

PAGE
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TRAFFIC VOLUMES
Existing, 2021 Background, and 2021 Buildout Conditions
PM Peak Hour





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Safety Analysis

Crash Data Analysis

Using data obtained from the ODOT's Crash Data System, a review was performed for the most recent five years of available crash data (January 2013 through December 2017) at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection. Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak hour represents 10 percent of the annual average daily traffic (AADT) at the intersection. Crash rates in excess of 1.00 crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

With regard to crash severity, ODOT classifies crashes in the following categories:

- Property Damage Only (*PDO*);
- Possible Injury – Complaint of Pain (*Injury C*);
- Non-Incapacitating Injury (*Injury B*);
- Incapacitating Injury – Bleeding, Broken Bones (*Injury A*); and
- Fatality or Fatal Injury

The study intersections along E Harbor Drive and US-101 are ODOT facilities, which adhere to the crash analysis methodologies within ODOT's *Analysis Procedures Manual*³ (APM). According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of their respective 90th percentile crash rates should be "flagged for further analysis". For intersections within urban settings (i.e. intersections within City limits), the following 90th percentile crash rates were referenced:

- For signalized, three-legged intersections, the 90th percentile rate is 0.509 CMEV;
- For unsignalized, three-legged intersections, the 90th percentile rate is 0.293 CMEV; and
- For unsignalized, four-legged intersections the 90th percentile rate is 0.408 CMEV.

Table 4 provides a summary of the crash types, while Table 5 summarizes crash severities and rates for each of the study intersections. Crash data is included in the technical appendix to this report.

³ Oregon Department of Transportation, *Analysis Procedures Manual*, Updated November 2018.



Table 4: Crash Type Summary

	Intersection	Crash Type					Total Crashes	
		Rear End	Turn	Angle	Side Swipe	Ped/Bike		Other
1	SE Neptune Drive at E Harbor Drive	1	4	0	0	0	0	5
2	Shopping Center Access at E Harbor Drive	0	9	18	0	0	0	27
3	US-101 at E Harbor Drive	15	4	0	1	0	1	21
4	Shopping Center Access at SE Neptune Drive	0	2	1	0	0	0	3

Table 5: Crash Severity and Rate Summary

	Intersection	Crash Severity					Total Crashes	AADT	Crash Rate	
		PDO	C	B	A	Fatal				Unknown
1	SE Neptune Drive at E Harbor Drive	2	0	3	0	0	0	5	11,180	0.245
2	Shopping Center Access at E Harbor Drive	13	9	5	0	0	0	27	12,220	1.211
3	US-101 at E Harbor Drive	13	6	2	0	0	0	21	23,090	0.498
4	Shopping Center Access at SE Neptune Drive	3	0	0	0	0	0	3	6,270	0.262

BOLDED text indicates a crash rate in excess of either 1.00 CMEV or the 90th Percentile CMEV per ODOT's APM.

Based on a review of the most recent five years of available crash data, the shopping center access intersection at E Harbor Drive exhibits a crash rate above the 1.00 CMEV and ODOT's 90th percentile crash rate of safety. Upon closer inspection of the crash data, 15 of the 27 reported crashes (55.6 percent) involved a northbound through vehicle colliding with a westbound through vehicle. However, these crashes may be attributed to the eastbound queues from the US-101 intersection at E Harbor Drive limiting sight lines when viewing east from the shopping center access. Observations of these queues were conducted on December 10th, 2019, where queues were observed as occasionally extending back to the shopping center access intersection. Details on these observations and suggestion of potential mitigation at the intersection is provided within the *Sight Distance Analysis* and *Intersection Queuing Analysis* sections of this study, respectively.

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Upon implementation of the suggested mitigation in the *Intersection Queuing Analysis* section, operation and safety at the access intersection is expected to improve.

No other significant trends or crash patterns were identified at either of the study intersections that were indicative of safety concerns. In addition, none of the other study intersections exhibit crash rates near or above the 1.00 CMEV threshold, nor do the intersections exhibit crash rates exceeding ODOT's 90th percentile rates. Accordingly, no other safety mitigation is recommended per the crash data analysis.

Detailed information about crashes and crash reports for the study intersections are included as an attachment to this memorandum.

Sight Distance Analysis

Intersection sight distance was measured at the existing shopping center accesses along E Harbor Drive and SE Neptune Drive. Sight distances were measured and evaluated in accordance with the standards established in *A Policy of Geometric Design of Highways and Streets*⁴. According to AASHTO, intersection sight distance is considered an operational measure, intended to provide sufficient line of sight along the major street so that a driver can enter the roadway without impeding the flow of through traffic. For intersection sight distance, the driver's eye is assumed to be 15 feet from the near edge of the nearest travel lane (or travelled way) of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The oncoming vehicle driver's eye height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement. Conversely, stopping sight distance is considered the minimum requirement to ensure safe operation of the driveway. This distance allows the driver of a vehicle traveling on the major street to react to a turning vehicle or other object in the roadway and come to a complete stop to avoid a collision. To ensure safe operation of a driveway, the extent of available intersection sight distance must at least equal the minimum required stopping sight distance.

Shopping Center Access at E Harbor Drive

Based on the posted speed of 45 mph along E Harbor Drive, the minimum recommended intersection sight distance for vehicles stopped on the minor-street approach is 500 feet to the east and west of the access. Intersection sight distance at the shopping center access was measured to be in excess of 600 feet west and measured back to the intersection of US-101 at E Harbor Drive.

It should be noted that queues from the intersection of US-101 at E Harbor Drive would at times extend back to the shopping center access intersection and limit sight distance to be less than 500 feet to the east of the of access. As described within the *Crash Data Analysis* section, these extended queues may be related to the high number of angle-type collisions at the intersection, involving northbound through and westbound through vehicles. Details on potential mitigation are discussed within the *Intersection Queuing Analysis* section.

⁴ American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011.



Shopping Center Access at SE Neptune Drive

Based on a statutory speed of 20 mph along SE Neptune Drive, the minimum recommended intersection sight distance for vehicles stopped on the minor-street approach is 225 feet while the minimum required stopping sight distance to ensure safety of the intersection is 115 feet. Intersection sight distance was measured to be in excess of 280 feet to the north, and 170 feet to the south, limited by foliage within a wetland area between SE Neptune Drive and Young's Bay Plaza.

Analysis Results

Based on the sight distance measurements, adequate intersection sight distance is available to allow safe and efficient operation of the shopping center access intersection along E Harbor Drive (not taking into consideration extended queues from the US-101 at E Harbor Drive intersection) while sufficient sight distance is available to allow the SE Neptune Drive intersection to operate safely. No sight distance related mitigation beyond those described within the *Intersection Queuing Analysis* section are necessary or recommended.

Multi-Modal Access and Safety

Motor Vehicles

Excluding the shopping center access intersection at E Harbor Drive where safety mitigation had be recommended as described in the *Intersection Queuing Analysis* section, the calculated crash rates at the study intersections were well below the 1.00 CMEV threshold of safety as well as below ODOT's 90th percentile crash rate for applicable intersections. In addition, no fatal or serious injury collisions (i.e. reported as *Injury A*) involving motor vehicle traffic was reported at any of the study intersections over the five-year analysis period. Since the reported crashes within the study area resulted in low severity crashes and the calculated crash rates at the study intersections were relatively low (excluding the shopping center access intersection at E Harbor Drive), there do not appear to be any trends indicative of significant safety hazards at the nearby transportation facilities.

With regard to site access, the site is served by two accesses: one along E Harbor Drive and the other along SE Neptune Drive. Given the site's close proximity to the E Harbor Drive access, it is assumed that a significant majority of site trips would utilize this driveway relative to the one along SE Neptune Drive. From E Harbor Drive, access to downtown Warrenton/Hammond and US-101 is available. US-101 will provide a connection for regional travel between the site and other major destinations including Astoria, Gearhart, and Seaside.

Based on a review of motor vehicle access and safety, no mitigation pertaining to this specific mode of travel is necessary or recommended.

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Pedestrians

As described in the *Crash Data Analysis* section, there were no pedestrian-related collisions reported at the study intersections over the five-year analysis period.

While sidewalks are generally not provided along either sides of E Harbor Drive or US-101 near the site, sidewalks are available along the west side of SE Neptune Drive.

Marked crossings across E Harbor Street, US-101, and SE Neptune Drive are available at the intersections of US-101 at E Harbor Drive, US-101 at SE Neptune Drive, and the shopping center access at SE Neptune Drive. In addition, walking paths and low vehicular travel speeds within the shopping center allow pedestrians the ability to walk safely and comfortably between the site and other nearby shopping center land uses.

Given the availability of existing pedestrian facilities in the site vicinity, no mitigation pertaining to this specific mode of travel is necessary or recommended.

Bicycles

As described in the *Crash Data Analysis* section, there were no bicycle-related collisions reported at the study intersections over the five-year analysis period.

Within the nearby site vicinity, bicycle lanes and paved shoulders wide enough to accommodate bicyclists are available along both sides of US-101 and E Harbor Drive. These bicycle paths extend out to the City of Astoria, downtown Warrenton, and the south City limits of Warrenton.

Given the availability of existing bicycle facilities in the site vicinity, no mitigation pertaining to this specific mode of travel is necessary or recommended.

Transit Users

Nearest public transit stop to the site is located along the west side of SE Neptune Drive approximately midway between E Harbor Drive and US-101. To access the transit stop from the site, transit users may navigate through the shopping center by way of pedestrian walking paths, when available, and can utilize the marked crossing across SE Neptune Drive near the shopping center access. Given the low vehicular travel speeds within the shopping center and along SE Neptune Drive, transit users can safely and comfortably travel between the site and the transit facility.

Given the accessibility of nearby transit stops and services, no mitigation pertaining to this specific mode of travel is necessary or recommended.

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Operational Analysis

Intersection Capacity

A capacity and delay analysis were conducted at the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual*⁵ (HCM). Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

According to the City of Warrenton's TSP, signalized and unsignalized intersections under City jurisdiction are required to operate at LOS D during the peak hour of analysis.

In addition, intersections that operate under the jurisdiction of ODOT must meet standards established in the *Oregon Highway Plan*⁶. Based on the classification, location, and posted speed of E Harbor Drive and US-101, the study intersections along these highways are required to operate with v/c ratios of 0.90 or less and 0.80 or less, respectively. However, per the City of Warrenton's TSP, alternative mobility standards which include utilizing a v/c ratio of 0.85 for intersections along US-101, within Warrenton city limits, were recommended to the Oregon Transportation Commission (OTC). It is expected these alternative standards will be adopted by the OTC prior to submittal of the proposed development application, whereby an 0.85 v/c ratio standard of operation was applied to the study intersection along US-101.

The v/c, delay, and LOS results of the capacity analysis are shown in Table 6 for the morning and evening peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included as an attachment to this memorandum.

⁵ Transportation Research Board, *Highway Capacity Manual*, 6th Edition, 2016.

⁶ Oregon Department of Transportation, *1999 Oregon Highway Plan*, 1999.



Table 6: Intersection Capacity Analysis Summary

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1 Shopping Center Access at E Harbor Drive						
2019 Existing Conditions	C	19	0.11	D	30	0.38
2021 Background Conditions	C	19	0.11	D	31	0.40
2021 Buildout Conditions	C	19	0.12	D	32	0.41
2 Shopping Center Access at E Harbor Drive						
2019 Existing Conditions	B	13	0.05	C	24	0.44
2021 Background Conditions	B	13	0.05	C	25	0.46
2021 Buildout Conditions	C	17	0.21	D	27	0.48
3 US-101 at E Harbor Drive						
2019 Existing Conditions	B	13	0.77	B	15	0.81
2021 Background Conditions	B	13	0.78	B	15	0.82
2021 Buildout Conditions	B	13	0.79	B	15	0.83
4 US-101 at E Harbor Drive						
2019 Existing Conditions	B	11	0.12	C	16	0.29
2021 Background Conditions	B	11	0.12	C	16	0.31
2021 Buildout Conditions	B	11	0.13	C	16	0.31

Based on the results of the operation analysis, all study intersections are currently and projected to continue operating acceptably per their respective jurisdictional standards through year 2021, regardless of the addition of proposed development site trips.

Queuing Analysis

Intersection Queuing Analysis

A queuing analysis was conducted for the intersection of US-101 at E Harbor Drive to determine whether queues from the intersection would extend back to the shopping center access intersection along E Harbor Drive. The queue lengths were projected based on the results of a Synchro/SimTraffic simulation, with the reported values representing the 95th percentile queue lengths. The 95th percentile queue is a statistical

measurement which indicates there is a 5 percent chance that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may theoretically never be met or observed in the field.

The projected 95th percentile queue lengths reported in the simulation are presented in Table 7 for the morning and evening peak hours. It should be noted that the reported queue lengths reflect those of the southeast-bound left-turn lane (the approach lane with the highest reported queue length) and were rounded up to the nearest five feet. Detailed queuing analysis worksheets are included in the technical appendix to this report.

Table 7: Intersection Queuing Analysis Summary

	Projected 95th Percentile Queue Length (ft)	
	Morning Peak Hour	Evening Peak Hour
2 US-101 at E Harbor Drive		
2019 Existing Conditions	210	295
2021 Background Conditions	215	310
2021 Buildout Conditions	240	315

Based on the analysis, the 95th percentile queues during the evening peak hour are projected to extend back to the shopping center access intersection. It is recommended that signage and/or striping be implemented at the access intersection to restrict drivers from blocking access to/from the driveway. Such mitigation may include the following:

- Post a “Do Not Block Intersection” sign (Sign Designation R10-7) for the eastbound approach at the shopping center access intersection along E Harbor Drive. The design of the sign should conform with standards set in the Manual on Uniform Traffic Controls Devices (MUTCD);
- Post an intersection ahead warning sign (Sign Designation W2-1) and a “Notice” rider sign (Sign Designation W16-18P) for the westbound approach between the US-101 and shopping center access intersections. The design of the signs should conform with standards set in the MUTCD; and/or
- Implement full-width striping at the access intersection, consistent with Section 3B.17 of the MUTCD.

A figure depicting the potential full-width striping design is shown on the following page.

le

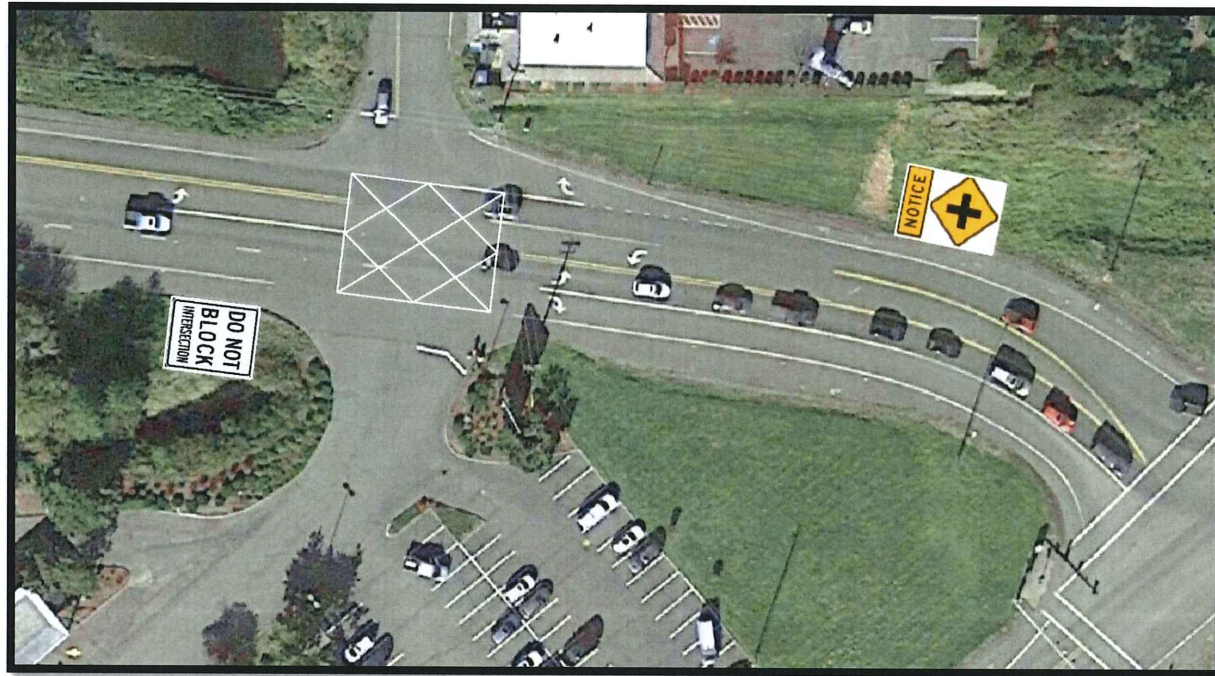


Figure 6: Do Not Block Intersection – Full-Width Design

Drive-Through Queuing

At the direction of City of Warrenton staff, a queuing analysis was conducted for the proposed Quality Mexican QSR drive-through to determine if the current drive-through design is sufficient to accommodate potential queues which may form.

In order to estimate potential drive-through queuing which may occur at the site, queuing observations were conducted at two existing drive-through facilities (Don Pedro Mexican Restaurants) that are expected to be similar to the proposed development. By similar, both facilities are located along or near major state roadways, have a single drive-through window, and are expected to serve a similar clientele based on the quality, cost, and type of food sold. The two specific restaurants that were chosen are located at 6501 NE Highway 99 and 5900 NE Fourth Plain Boulevard in Vancouver, Washington.

It should be noted that the proposed Quality Mexican QSR drive-through is expected to operate more efficiently than a standard drive-through. Standard restaurant drive-throughs typically include an ordering board with a subsequent window for exchange of payment and food. The proposed restaurant will require that customers order and pay for food digitally, whereby customers do not need to enter a drive-through lane until their order is ready. Once a customer has been notified that their food is ready for pick-up, then they may enter the drive-through and be served in a more expedient manner. This unique process for ordering and picking up food is expected to significantly decrease customer wait times within the drive-through lane whereby queues are expected to be significantly less than a standard drive-through. It should be noted there is



no specific measure in place to dissuade drivers from ordering while queued; however, assuming this becomes the norm amongst all patrons of the proposed use, the proposed drive-through will operate similar to the observed facilities.

Observations were conducted at both existing facilities on Wednesday, December 11th, 2019 and on Thursday, December 12th, 2019, at times between approximately 7:30 AM through 9:00 AM, 11:30 AM through 1:00 PM, and 5:30 PM through 7:00 PM. These chosen timeframes for observations were selected given they are expected to correlate with the general peaks of customer arrivals to the site for a typical weekday. It should be noted that per the *Trip Generation Manual*, it is expected the peak period of weekday trip generation would typically occur during the 11:30 AM through 1:00 PM timeframe. Each comparative location was observed for approximately 30 minutes.

Based on the queuing observations, the largest observed queues consisted of 6 vehicles and occurred during the mid-day lunch peak, from between 11:30 AM and 1:00 PM. The queuing observations results are presented in Table 8.

Table 8: Queuing Observation Summary

	Largest Observed Vehicle Queues	
	6501 NE Hwy 99	5900 NE Fourth Plain Blvd
Morning Peak (7:30 AM to 9:00 AM)	2	3
Mid-Day Peak (11:30 AM to 1:00 PM)	5	6
Evening Peak (5:30 PM to 7:00 PM)	2	4

Upon reviewing the site plan of the proposed Quality Mexican QSR, the planned drive-through provides approximately 138 feet of vehicle queue storage. Assuming each vehicle occupies approximately 20 feet of space within the queue (16 feet per vehicle with a 4-foot buffer between vehicles), the proposed drive-through may accommodate up to 6 vehicles prior to queues extending back into the shopping center parking lot.

Based on the queuing observations as well as a review of the proposed site plan, the proposed development is expected to have sufficient storage space to accommodate potential queues which may form within the drive-through. Accordingly, no queuing related mitigation is necessary or recommended.



Conclusions

All study intersections are currently and projected to continue operating acceptably per their respective jurisdictional standards through year 2021, regardless of the addition of proposed development site trips.

Excluding the shopping center access intersection along E Harbor Drive:

- No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. In addition, none of the other study intersections exhibit crash rates near or above the 1.00 CMEV threshold, nor do the intersections exhibit a crash rate exceeding ODOT's 90th percentile rate.
- Adequate intersection sight distance is available to allow safe and efficient operation of the shopping access intersection along SE Neptune Drive.
- Based on an evaluation of the motor vehicle, pedestrian, bicycle, and transit user safety, no additional safety-related mitigation within the nearby site vicinity is expected to be necessary as part of the proposed use.

The shopping center access intersection along E Harbor Drive had a high number of reported crashes over the five-year analysis period, specifically angle-type collisions between northbound through and westbound through vehicles. It is believed these crashes may be related to southeast-bound queues at the intersection of US-101 at E Harbor Drive extending back to the access intersection and limiting sight lines viewing east from the access. Based on a queuing analysis, in addition to field observations, the 95th percentile southeast-bound queues from the intersection of US-101 at E Harbor Drive are projected to extend back to the shopping center access intersection during the evening peak hour. It is recommended that signage and striping be implemented at the access intersection to restrict drivers from blocking access to/from the driveway. Specific mitigation includes the following:

- Post a "Do Not Block Intersection" sign (R10-7) for the eastbound approach at the shopping center access intersection along E Harbor Drive;
- Post an intersection ahead warning sign (W2-1) and a "Notice" rider sign (W16-18P) for the westbound approach between the US-101 and access intersections; and/or
- Implement full-width striping at the access intersection, consistent with Section 3B.17 of the MUTCD.

Based on queuing observations conducted at two existing restaurants which serve similar quality, cost, and styles of food as well as a review of the proposed site plan, the proposed development is expected to have sufficient storage space to accommodate potential queues which may form within the drive-through. Accordingly, no drive-through queuing related mitigation is necessary or recommended.

If you have any questions regarding this technical memorandum, please don't hesitate to contact us.

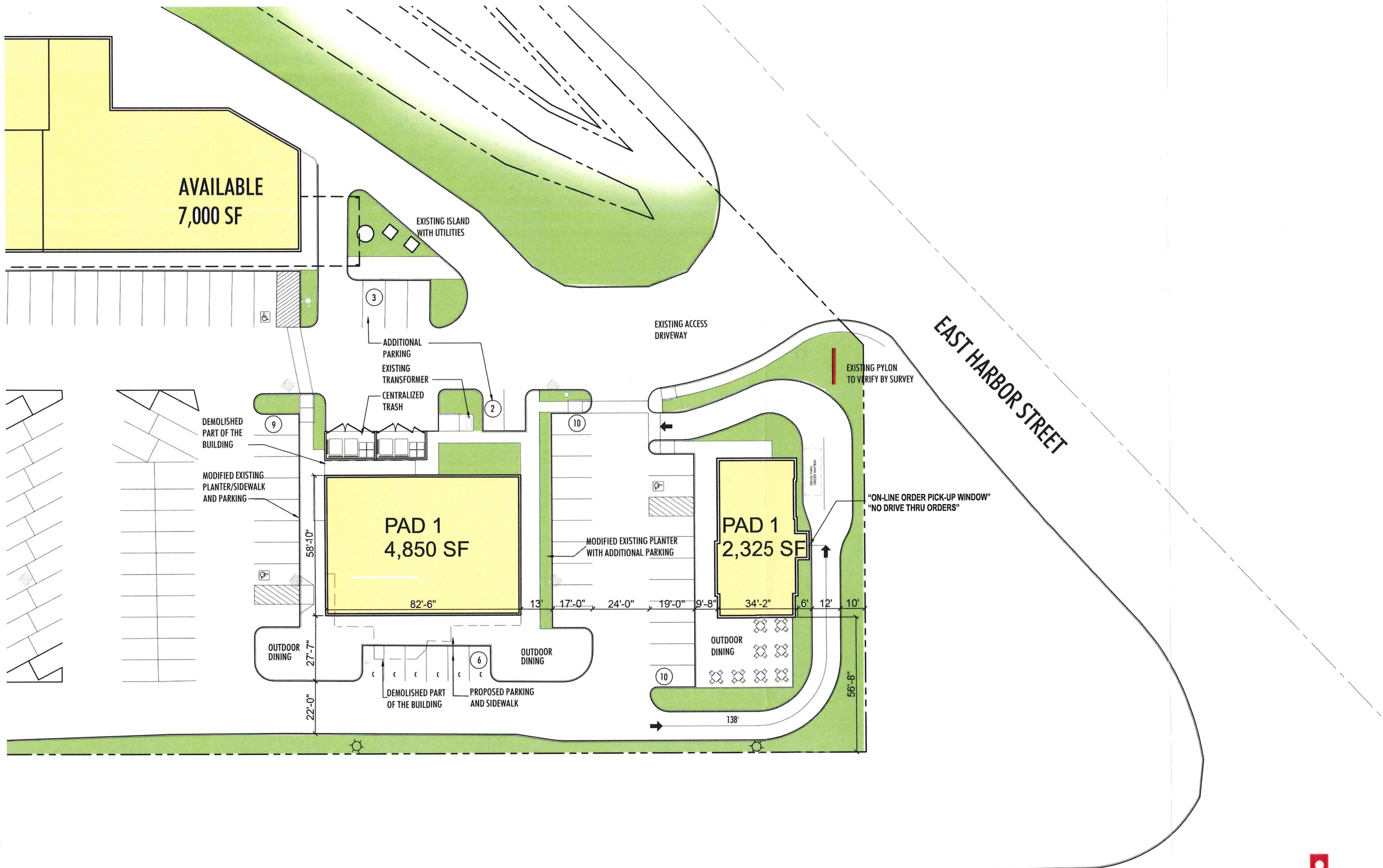
Well-crafted simplicity.

ATLAS INVESTMENTS

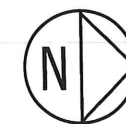
NORTH COAST WARRENTON PAD BUILDING

AI 18015
 11.25.19

© 2019 Baysinger Partners Architecture



US HIGHWAY 101



SITE PLAN

SCALE



1e

TRIP GENERATION CALCULATIONS

Land Use: Fast-Food Restaurant with a Drive-Thru Window
Land Use Code: 934
Setting/Location: General Urban/Suburban
Variable: 1,000 Sq. Ft. GFA
Variable Value: 2.325

AM PEAK HOUR

Trip Rate: 40.19

	Enter	Exit	Total
Directional Distribution	51%	49%	
Trip Ends	47	46	93

PM PEAK HOUR

Trip Rate: 32.67

	Enter	Exit	Total
Directional Distribution	52%	48%	
Trip Ends	40	36	76

WEEKDAY

Trip Rate: 470.95

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	547	547	1,094

SATURDAY

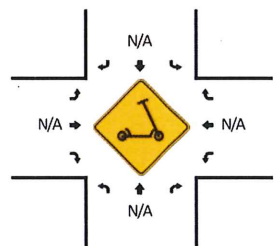
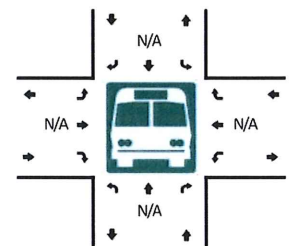
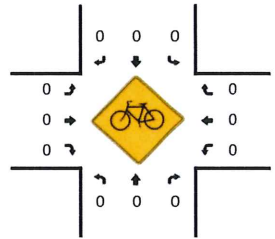
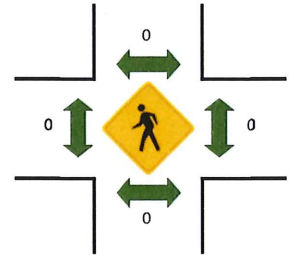
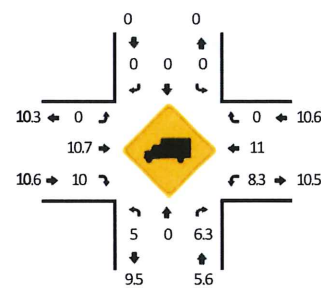
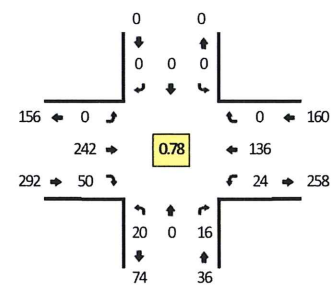
Trip Rate: 616.12

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	716	716	1,432

LOCATION: SE Neptune Dr -- E Harbor Dr
 CITY/STATE: Warrenton, OR

QC JOB #: 15213101
 DATE: Tue, Mar 17 2020

Peak-Hour: 7:25 AM -- 8:25 AM
 Peak 15-Min: 7:40 AM -- 7:55 AM



5-Min Count Period Beginning At	SE Neptune Dr (Northbound)				SE Neptune Dr (Southbound)				E Harbor Dr (Eastbound)				E Harbor Dr (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
6:00 AM	0	0	0	0	0	0	0	0	0	0	3	1	0	2	8	0	0	14	
6:05 AM	0	0	0	0	0	0	0	0	0	0	5	3	0	2	6	0	0	16	
6:10 AM	0	0	1	0	0	0	0	0	0	0	9	3	0	1	5	0	0	19	
6:15 AM	1	0	1	0	0	0	0	0	0	0	11	1	0	1	1	0	0	16	
6:20 AM	0	0	0	0	0	0	0	0	0	0	6	1	0	1	11	0	0	19	
6:25 AM	1	0	0	0	0	0	0	0	0	0	9	2	0	2	5	0	0	19	
6:30 AM	2	0	2	0	0	0	0	0	0	0	9	1	0	1	10	0	0	25	
6:35 AM	1	0	2	0	0	0	0	0	0	0	13	1	0	1	13	0	0	31	
6:40 AM	0	0	1	0	0	0	0	0	0	0	9	2	0	1	10	0	0	23	
6:45 AM	0	0	1	0	0	0	0	0	0	0	15	3	0	2	11	0	0	32	
6:50 AM	2	0	0	0	0	0	0	0	0	0	11	3	0	1	13	0	0	30	
6:55 AM	0	0	1	0	0	0	0	0	0	0	8	1	0	2	12	0	0	24	268
7:00 AM	0	0	1	0	0	0	0	0	0	0	14	1	0	2	6	0	0	24	278
7:05 AM	0	0	0	0	0	0	0	0	0	0	10	4	0	1	4	0	0	19	281
7:10 AM	0	0	0	0	0	0	0	0	0	0	12	0	0	2	8	0	0	22	284
7:15 AM	1	0	2	0	0	0	0	0	0	0	13	4	0	3	9	0	0	32	300
7:20 AM	1	0	0	0	0	0	0	0	0	0	19	4	0	3	8	0	0	35	316
7:25 AM	3	0	0	0	0	0	0	0	0	0	18	1	0	5	12	0	0	39	336
7:30 AM	1	0	1	0	0	0	0	0	0	0	20	7	0	1	14	0	0	44	355
7:35 AM	2	0	4	0	0	0	0	0	0	0	17	4	0	1	13	0	0	41	365
7:40 AM	1	0	1	0	0	0	0	0	0	0	20	6	0	2	13	0	0	43	385
7:45 AM	2	0	0	0	0	0	0	0	0	0	26	5	0	5	15	0	0	53	406
7:50 AM	1	0	4	0	0	0	0	0	0	0	31	5	0	1	19	0	0	61	437
7:55 AM	3	0	1	0	0	0	0	0	0	0	16	6	0	1	12	0	0	39	452
8:00 AM	3	0	2	0	0	0	0	0	0	0	21	5	0	1	6	0	0	38	466
8:05 AM	0	0	1	0	0	0	0	0	0	0	15	0	0	3	9	0	0	28	475
8:10 AM	1	0	1	0	0	0	0	0	0	0	20	1	0	1	8	0	0	32	485
8:15 AM	0	0	0	0	0	0	0	0	0	0	18	4	0	0	5	0	0	27	480
8:20 AM	3	0	1	0	0	0	0	0	0	0	20	6	0	3	10	0	0	43	488
8:25 AM	1	0	2	0	0	0	0	0	0	0	19	0	0	3	10	0	0	35	484
8:30 AM	2	0	1	0	0	0	0	0	0	0	19	3	0	6	8	0	0	39	479
8:35 AM	2	0	1	0	0	0	0	0	0	0	4	5	0	3	14	0	0	29	467
8:40 AM	2	0	5	0	0	0	0	0	0	0	17	1	0	5	17	0	0	47	471
8:45 AM	1	0	4	0	0	0	0	0	0	0	15	5	0	5	15	0	0	45	463
8:50 AM	2	0	1	0	0	0	0	0	0	0	15	9	0	5	6	0	0	38	440
8:55 AM	2	0	2	0	0	0	0	0	0	0	14	3	0	1	11	0	0	33	434

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	0	20	0	0	0	0	0	0	308	64	0	32	188	0	0	628
Heavy Trucks	4	0	0		0	0	0		0	36	4		8	16	0		68
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

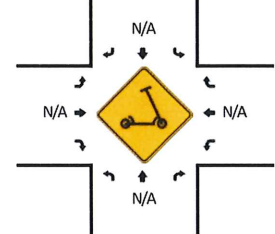
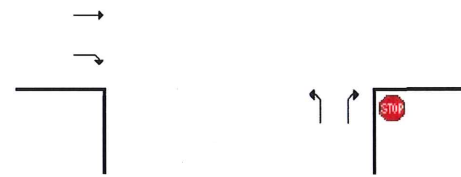
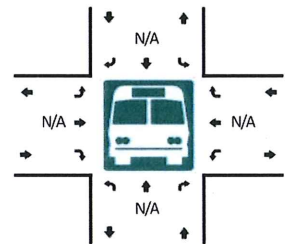
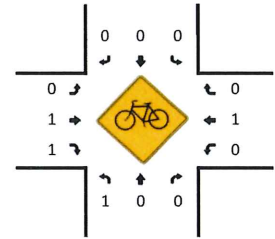
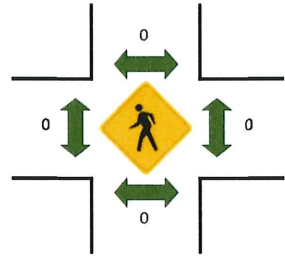
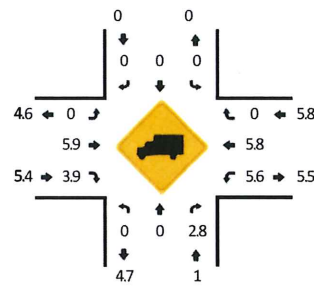
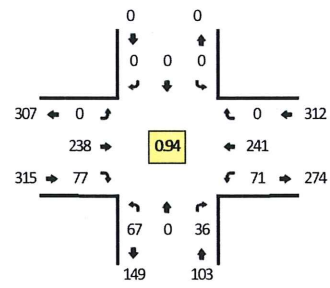
Report generated on 3/23/2020 2:48 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

LOCATION: SE Neptune Dr -- E Harbor Dr
 CITY/STATE: Warrenton, OR

QC JOB #: 15213102
 DATE: Tue, Mar 17 2020

Peak-Hour: 3:35 PM -- 4:35 PM
 Peak 15-Min: 3:35 PM -- 3:50 PM



5-Min Count Period Beginning At	SE Neptune Dr (Northbound)				SE Neptune Dr (Southbound)				E Harbor Dr (Eastbound)				E Harbor Dr (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
3:00 PM	4	0	8	0	0	0	0	0	0	0	14	3	0	4	28	0	0	61	
3:05 PM	5	0	4	0	0	0	0	0	0	0	15	6	0	3	15	0	0	48	
3:10 PM	5	0	3	0	0	0	0	0	0	0	17	2	0	6	14	0	0	47	
3:15 PM	7	0	5	0	0	0	0	0	0	0	9	4	0	6	22	0	0	53	
3:20 PM	8	0	4	0	0	0	0	0	0	0	20	7	0	5	16	0	0	60	
3:25 PM	4	0	8	0	0	0	0	0	0	0	15	5	0	5	19	0	0	56	
3:30 PM	4	0	5	0	0	0	0	0	0	0	22	2	0	2	20	0	0	55	
3:35 PM	3	0	7	0	0	0	0	0	0	0	22	6	0	5	22	0	0	65	
3:40 PM	4	0	1	0	0	0	0	0	0	0	30	9	0	4	27	0	0	75	
3:45 PM	5	0	4	1	0	0	0	0	0	0	19	4	0	8	13	0	0	54	
3:50 PM	10	0	1	0	0	0	0	0	0	0	14	5	0	5	22	0	0	57	
3:55 PM	4	0	2	0	0	0	0	0	0	0	14	3	0	8	22	0	0	53	684
4:00 PM	4	0	4	0	0	0	0	0	0	0	20	7	0	9	15	0	0	59	682
4:05 PM	6	0	2	0	0	0	0	0	0	0	23	3	0	7	23	0	0	64	698
4:10 PM	8	0	3	0	0	0	0	0	0	0	18	10	0	3	24	0	0	66	717
4:15 PM	5	0	4	0	0	0	0	0	0	0	14	5	0	6	18	0	0	52	716
4:20 PM	6	0	3	0	0	0	0	0	0	0	15	8	0	5	14	0	0	51	707
4:25 PM	4	0	1	0	0	0	0	0	0	0	27	9	0	8	20	0	0	69	720
4:30 PM	7	0	4	0	0	0	0	0	0	0	22	8	0	3	21	0	0	65	730
4:35 PM	5	0	1	0	0	0	0	0	0	0	11	9	0	3	16	0	0	45	710
4:40 PM	5	0	7	0	0	0	0	0	0	0	14	6	0	5	29	0	0	66	701
4:45 PM	5	0	0	0	0	0	0	0	0	0	29	4	0	9	13	0	0	60	707
4:50 PM	4	0	3	0	0	0	0	0	0	0	19	6	0	4	20	0	0	56	706
4:55 PM	4	0	6	0	0	0	0	0	0	0	14	3	0	6	20	0	0	53	706
5:00 PM	1	0	6	0	0	0	0	0	0	0	19	2	0	4	13	0	0	45	692
5:05 PM	7	0	3	0	0	0	0	0	0	0	18	2	0	6	17	0	0	53	681
5:10 PM	3	0	6	0	0	0	0	0	0	0	15	6	0	9	27	0	0	66	681
5:15 PM	0	0	3	0	0	0	0	0	0	0	17	6	0	3	34	0	0	63	692
5:20 PM	7	0	4	0	0	0	0	0	0	0	24	1	0	4	14	0	0	54	695
5:25 PM	5	0	3	0	0	0	0	0	0	0	16	1	0	4	29	0	0	58	684
5:30 PM	2	0	2	0	0	0	0	0	0	0	13	9	0	6	17	0	0	49	668
5:35 PM	5	0	3	0	0	0	0	0	0	0	20	4	0	4	22	0	0	58	681
5:40 PM	2	0	1	0	0	0	0	0	0	0	13	2	0	7	21	0	0	46	661
5:45 PM	7	0	1	0	0	0	0	0	0	0	18	4	0	2	14	0	0	46	647
5:50 PM	3	0	1	0	0	0	0	0	0	0	16	2	0	5	14	0	0	41	632
5:55 PM	7	0	1	0	0	0	0	0	0	0	18	4	0	5	12	0	0	47	626

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	48	0	48	4	0	0	0	0	0	284	76	0	68	248	0	0	776
Heavy Trucks	0	0	4		0	0	0		0	24	4		4	24	0		60
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	4	0		0	0	0		4
Scooters																	

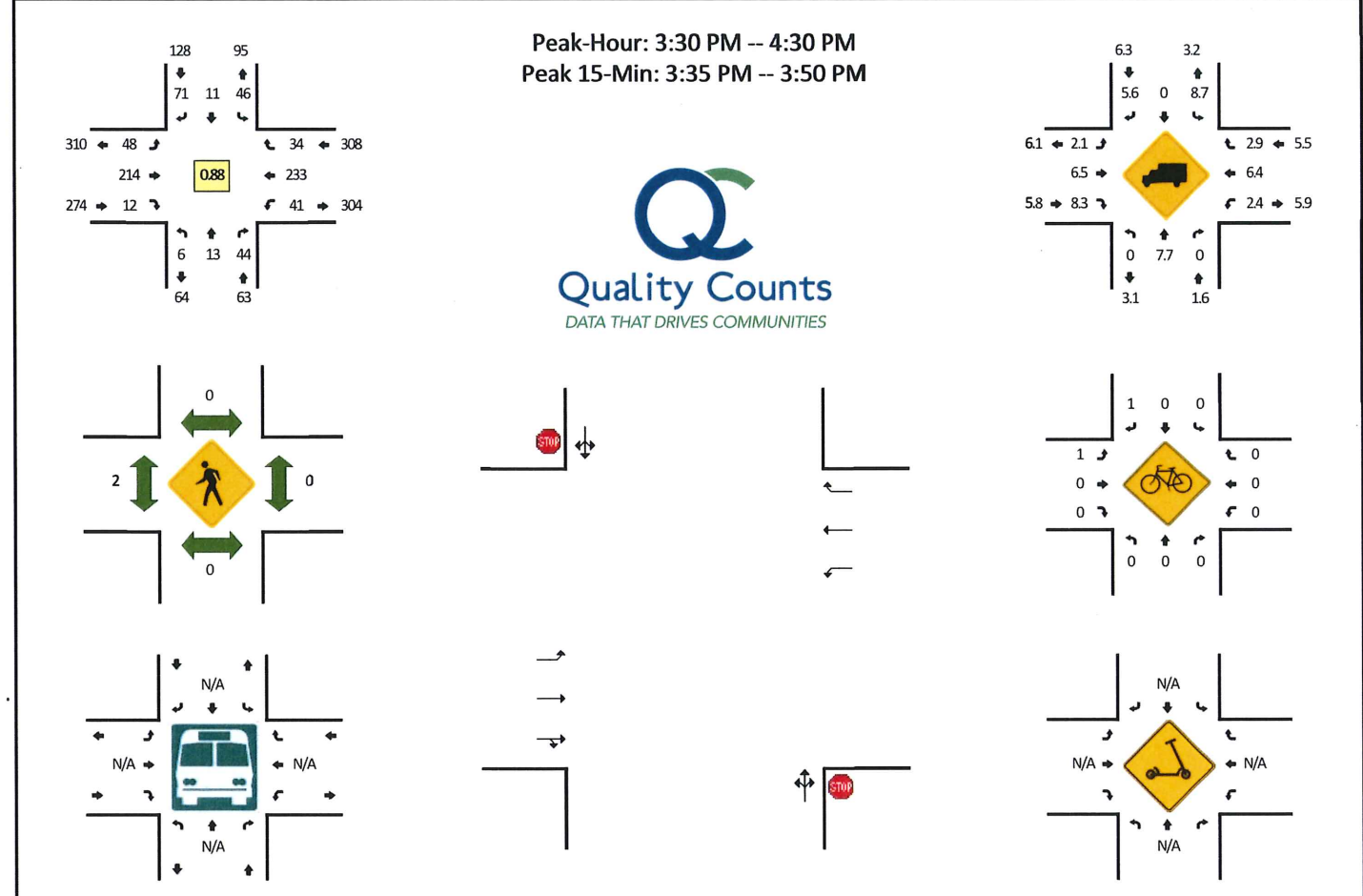
Comments:

Report generated on 3/23/2020 2:48 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

LOCATION: Shopping Center Dwy -- E Harbor Dr
 CITY/STATE: Warrenton, OR

QC JOB #: 15213105
 DATE: Tue, Mar 17 2020



5-Min Count Period Beginning At	Shopping Center Dwy (Northbound)				Shopping Center Dwy (Southbound)				E Harbor Dr (Eastbound)				E Harbor Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	1	1	1	0	4	1	6	0	3	19	1	0	5	22	1	0	65	
3:05 PM	1	0	2	0	4	0	4	0	4	15	2	0	4	13	0	0	48	
3:10 PM	0	1	5	0	5	0	2	0	2	18	0	0	4	17	2	0	56	
3:15 PM	0	1	4	0	4	1	5	0	1	11	1	0	1	22	2	0	53	
3:20 PM	0	0	3	0	3	1	2	0	8	16	0	0	3	20	2	0	58	
3:25 PM	1	0	1	0	3	0	3	0	1	21	2	0	7	22	1	0	62	
3:30 PM	1	0	6	0	4	0	4	0	9	14	0	0	1	16	0	0	55	
3:35 PM	0	0	1	0	4	3	4	0	3	27	1	0	6	22	2	0	73	
3:40 PM	1	2	6	0	3	1	1	0	7	23	0	0	3	29	2	0	78	
3:45 PM	1	1	4	0	9	1	2	0	3	19	2	0	5	18	4	0	69	
3:50 PM	0	0	3	0	6	0	5	0	2	11	1	0	3	22	1	0	54	
3:55 PM	0	2	3	0	4	0	11	0	5	11	1	0	6	18	5	0	66	737
4:00 PM	0	1	3	0	0	2	6	0	3	2	1	0	5	20	3	0	46	718
4:05 PM	1	0	4	0	0	0	13	0	6	34	2	0	2	16	6	0	84	754
4:10 PM	0	3	2	0	6	1	5	0	4	15	2	0	2	20	4	0	64	762
4:15 PM	0	0	4	0	5	0	6	0	1	19	0	0	3	19	1	0	58	767
4:20 PM	1	2	4	0	4	2	5	0	2	14	2	0	3	11	4	0	54	763
4:25 PM	1	2	4	0	1	1	9	0	3	25	0	0	2	22	2	0	72	773
4:30 PM	0	1	3	0	3	0	1	0	4	19	0	0	1	19	2	0	53	771
4:35 PM	1	0	3	0	5	4	5	1	4	8	2	0	3	15	2	0	53	751
4:40 PM	0	1	2	0	5	0	5	0	6	16	0	0	3	27	3	0	68	741
4:45 PM	0	1	3	0	5	0	4	0	3	24	1	0	4	19	4	0	68	740
4:50 PM	0	1	2	0	3	4	6	0	5	16	2	0	0	19	1	0	59	745
4:55 PM	0	0	1	0	3	3	5	0	2	16	3	0	2	19	2	0	56	735
5:00 PM	0	1	5	0	3	2	5	0	2	23	0	0	1	13	1	0	56	745
5:05 PM	0	1	3	0	4	0	6	0	2	18	0	0	1	17	1	0	53	714
5:10 PM	0	1	2	0	6	0	6	0	6	14	0	0	8	32	3	0	78	728
5:15 PM	1	1	3	0	5	0	4	0	5	16	1	0	4	29	0	0	69	739
5:20 PM	0	1	4	0	7	0	5	0	5	22	0	0	3	13	3	0	63	748
5:25 PM	0	0	6	0	3	3	8	0	4	16	0	0	2	28	1	0	71	747
5:30 PM	0	1	2	0	4	2	1	0	1	14	0	0	5	19	1	0	50	744
5:35 PM	0	0	4	0	2	1	9	0	2	21	0	0	1	18	2	0	60	751
5:40 PM	0	0	4	0	3	1	1	0	4	9	0	0	1	27	0	0	50	733
5:45 PM	0	0	2	0	2	2	3	0	1	16	0	0	3	15	7	0	51	716
5:50 PM	0	2	6	0	3	0	2	0	5	13	2	0	1	14	5	0	53	710
5:55 PM	1	0	1	0	4	0	6	0	3	16	0	0	4	12	2	0	49	703

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	12	44	0	64	20	28	0	52	276	12	0	56	276	32	0	880
Heavy Trucks	0	4	0		8	0	4		4	20	4		0	24	0		68
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		4	0	0		0	0	0		4
Scoters																	

Comments:

Report generated on 3/23/2020 2:49 PM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212