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TRANSPORTATION IMPACT STUDY

To
City of Manzanita

For
Heron's Rest

Dated
November 28, 2022

Project Number
2220194.00

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Since 1960

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I. INTRODUCTION

This Traffic Impact Analysis (TIA) has been prepared in support of the proposed Heron's Rest residential project in Manzanita, Oregon. Figure 1 in Appendix A presents a vicinity map indicating the project location.

Project Description

The proposed Heron's Rest residential project located at the end of Hallie Lane, to the west of 3rd Street in Manzanita, OR, will include 26 residential units, each approximately 650 square feet in size. The project will also include a community gathering shelter, recreational facilities, open space areas and a playground.

Six units will have frontage on 3rd Street with garages and driveways. Ten units at the west end of the site near Hallie Lane will have garages with a driveway suitable for a vehicle parking space. Parking for the interior units without garages will be in a centralized parking lot. Access to the parking lot and west end units with garages may be from Hallie Lane, 3rd Street, or both. At a minimum, a fire lane will be provided for emergency vehicle access through the site between 3rd Street and Hallie Lane.

Up to 52 parking spaces will be provided, although a reduction to the parking standards is being requested to allow for a rate as low as 1.5 spaces per unit based on the anticipated actual needs.

The project is not likely to be used for vacation rentals due to the City requirements for two parking spaces per rental and the size of the units is more attractive for local residents and as second homes.

Scope of Analysis

This TIS has been prepared in accordance with the ODOT APM Version 2 and the scoping memo from Lancaster Mobley Date August 24, 2022. This TIS includes a summary of existing traffic conditions, proposed trip generation, trip distribution and assignment, crash review, an analysis of intersection operations, and queuing. The scoping letter is provided in Appendix B.

Study Area

This TIA includes a study of the following City of Manzanita intersections:

- Laneda Avenue at Carmel Avenue
- Laneda Avenue at 3rd Street
- Laneda Avenue at Highway 101
- Carmel Avenue at Hallie Lane
- 3rd Street at the Site Driveway

Analysis Scenarios

Analysis is provided for all study area intersections. This TIS addresses transportation conditions for the following analysis scenarios during the PM peak hours and Saturday peak hours:

- 2022 Existing
- 2024 Pre-Development without Heron's Rest

- 2024 Post-Development with Heron’s Rest

II. EXISTING CONDITIONS

The existing conditions analysis is based on a current year 2022 inventory of transportation facilities and traffic data collected on August 18th and 20th of 2022.

Site Conditions

The project site is located at the end of Hallie Lane, west of S 3rd Street in Manzanita, Oregon. Approximately 60% of the 1.83-acre site is zoned R3, High Density Residential, with the reminder zoned R2, and consists of property identification number tax lot 200. The site is currently vacant.

Vehicular Transportation Facilities

The study area presented in this tax lot TIA includes roadways under City of Manzanita as well as ODOT jurisdiction. Figure 3 presents the existing lane configurations and traffic control devices for the study area intersections. Table 1 summarizes the characteristics of the study area roadways.

TABLE 1 – ROADWAY CHARACTERISTICS

Roadway	Functional Classification	Posted Speed (mph)	Travel Lanes	Lane Width	Shoulder Width	Bike Lanes	On-Street Parking	Sidewalks
Highway 101	Principal Arterial/Statewide Highway	40	2	12 ft		No	No	Yes
Laneda Avenue	Collector	20	2	10 ft		No	Yes	Yes
3rd Street	Local	20	2	10 ft		No	Yes	No
Carmel Avenue	Local	20	2	11 ft		Yes	No	Yes
Hallie Lane	Local	20	1	11 ft		No	Yes	No

Pedestrian and Bike Facilities

Sidewalks are currently provided on some of the area roadways as noted above, but not on 3rd Street or Hallie Lane. Bike lanes are provided on Carmel near the site.

Transit Facilities

The city of Manzanita is part of the NWConnector transit system. Route 3 provides service provides service to Manzanita as it passes between Cannon Beach and Tillamook. The greater NWConnector transit system provides connections between Astoria to the north and Yachats to the south along Highway 101. It also provides connections to the east, from Kelso, Washington to the north to Albany, Oregon to the south,

primarily along the I-5 corridor. A copy of NW Connector Route 3 schedule and map have been provided in the appendix.

Existing Traffic Counts

Turning movement counts utilized in this study were collected on Thursday, August 18 and Saturday August 20, 2022. **Error! Reference source not found.** presents the existing PM peak hour and Saturday peak hour traffic volumes for all study area intersections. Raw traffic count summaries are provided in Appendix C.

Seasonal Adjustment

Seasonal adjustment factors were review using the ATR Characteristic Table Method and ATR Seasonal Trend Method. They confirm that August is the peak time of year for Highway 101. Therefore, no seasonal adjustment was applied to the 2022 existing counts.

Crash Analysis

Historical crash data reported for the study area intersections were evaluated for safety. Crash data for the 5-year period of 2016 through 2020 were obtained from ODOT and used to review crash patterns and estimate crash rates for the study area intersections.

The crash evaluation is summarized in Table 2. The raw crash data is provided in Appendix F.

TABLE 2 – INTERSECTION CRASH RATES

Intersection (Traffic Control Type)	Year					Total Crashes	ADT	Crash Rate	ODOT's 90th Percentile Rate
	2016	2017	2018	2019	2020				
Laneda Avenue/Carmel Avenue (Urban 3ST)	0	0	0	0	0	0	2,000	0.00	0.408
Laneda Avenue/3rd Street (Urban 3ST)	0	0	0	0	0	0	2,200	0.00	0.408
Laneda Avenue/Highway 101 (Rural 3ST)	1	0	0	0	0	1	6,400	0.09	0.475

Crash Data Summary

One (1) crash was reported in the study area during the five-year analysis period. The crashes was a Rear-End type crash and resulted in Property Damage Only (PDO). Reportedly the at fault driver failed to avoid the driver ahead.

Intersection Crash Rates

When evaluating the relative safety of an intersection, consideration is given not only to the total number and types of crashes occurring, but also to the number of vehicles entering the intersection. This concept, referred to as a "crash rate", is usually expressed in terms of the number of crashes occurring per one

million entering vehicles (MEV) for the intersection per year. Intersections having a crash rate higher than 1.0 crashes/MEV should be reviewed for opportunities to improve safety.

The intersection crash rate is calculated by dividing the average number of crashes per year by the MEV per year. A daily traffic volume was estimated by dividing the PM peak hour volume at each intersection by a peak-to-daily factor, or k-factor. A k-factor of 0.156 from ODOT traffic data taken 0.02 miles south of Laneda Avenue on Highway 101 that is available on ODOT's TransGIS web portal, and the PM peak hour traffic count collected on August 18, 2022. This factor was applied to all study area intersections to estimate ADT.

All intersections were calculated to have a crash rate below 1.0 crashes/MEV. No further crash analysis is recommended.

III. PRE-DEVELOPMENT CONDITIONS

The pre-development condition reflects a build-out year scenario without the city of Manzanita's proposed fire station. This scenario includes traffic from the 2022 existing condition, background traffic growth to the year 2024, and in-process traffic from other approved developments that have not yet been constructed.

Planned Transportation Improvements

None noted in the study area.

Background Traffic Growth

Background traffic growth is applied to existing traffic volumes to forecast future traffic demand. ODOT's 2040 Future Volumes Table. The 2040 Future Volumes Table had data 0.2 miles north of Manzanita Avenue and 0.2 miles south of Laneda Avenue along Highway 101. Both growth rates were estimated to be below 1%. As a conservative measure a 1% annual background growth was applied to existing 2022 traffic volumes over two (2) years to estimate 2024 background traffic. Background growth was applied to all movements at all intersections.

Figure 6 presents the PM peak hour and Saturday peak hour background traffic growth volumes for all study area intersections.

In-Process Traffic

In-process traffic volumes account for developments that have been approved or that are under construction at the time of a traffic study. These traffic volumes account for traffic that will be added to the external roadway network before build-out of the proposed development. Traffic volumes for the following developments were included in the analysis to account for in-process traffic:

- Manzanita Lofts
- Steelejack
- Expansion Manzanita Grocery & Deli "The Little Apple"
- Highlands Residential Community
- Whispering Pines Housing
- Three Housing Units at the SW corner of Pacific Lane and Tie Lane

Error! Reference source not found. presents the PM peak hour and Saturday peak hour in-process trips for the above project.

Pre-Development Traffic

The 2024 pre-development analysis scenario is a combination of 2022 existing traffic, a 1% annual background growth rate over two (2) years, and in-process traffic. The pre-development traffic without the project trips will indicate if traffic issues are present before the addition of the proposed residential project.

Figure 7 presents the PM peak hour and Saturday peak hour 2024 pre-development traffic volumes.

IV. SITE DEVELOPMENT

The trip-making characteristics of the proposed development are described below.

Trip Generation

Trip generation estimates for the proposed project were developed using the Institute of Transportation Engineers' (ITE) *Trip Generation Manual,* 11th Edition. The ITE land uses that best match the proposed project is Residential Planned Unit Development. The Recreational Home Land Use Code (LUC) was deemed inappropriate due to the proposed project being located within the City of Manzanita's Urban Growth Boundary (UGB), and the description of a Recreational Home being located within a rural area.

The description of a Residential Planned Unit Development is any combination of residential land uses. The development may also contain recreational facilities. The proposed project plans to have communal areas with playgrounds, areas to allow residents to gather for planned events, and gardens.

Site trip generation estimates for the proposed development are based on the 26 planned dwelling units.

A trip generation summary is presented in **Error! Reference source not found.**.

TABLE 3 – TRIP GENERATION

ITE Code	ITE Land Use	Size	Trip Type	PM Peak Hour			Saturday Peak Hour			Daily
				In	Out	Total	In	Out	Total	
270	Residential Planned Unit Development	26 Dwelling Units	Primary	12	6	18	7	8	15	190

Trip Distribution and Assignment

Trip distribution for the proposed development was estimated using existing traffic volumes at the study area intersections. Based on existing volumes at the Laneda Avenue intersections with Carmel and 3rd Street about 20% of the PM and Saturday trips would be expected remain in town and travel to and from the west, with the remaining 80% traveling out of town towards Highway 101. At Highway 101, vehicles are split about one-third to the north and two-thirds to the south.

- 20% To/From the West on Laneda Avenue
- 25% To/From the North on Highway 101
- 55% To/From the South on Highway 101

Post-Development Traffic

Post-development traffic volumes are the sum of the site trips and the pre-development traffic volumes. Figure 9 presents the PM peak hour and Saturday peak hour 2024 post-development traffic volumes, assuming a one-way westbound driveway through the site between 3rd Street and Hallie Lane.

V. SITE ACCESS, CIRCULATION AND PARKING

The evaluation of site access and on-site circulation are presented below. This evaluation includes assessment of sight distance.

Site Access and Circulation

The six units with frontage on 3rd Street will have garages and driveways directly on 3rd Street.

The other 20 units will have either garages or an internal parking lot with shared public street access at either the existing termination of Hallie Lane at the west end of the site, 3rd Street approximately mid-point in the frontage, or both.

Access to both streets would allow for a one-way flow on a private drive aisle between 3rd Street and Hallie Lane, likely in a westbound direction. This is the assumption used in the analysis of trip assignment and impacts.

With access to Hallie Lane only, all but the units with driveways on 3rd Street would use Hallie Lane, and a fire lane would be provided to 3rd Street for emergency access.

With access only to 3rd Street, the site would not add any trips to Hallie Lane – only a fire access lane would be provided.

Vehicles parking in the lot on-site will use Hallie lane for ingress/egress due to the proposed flow. The impact on Hallie will depend on whether flow is one-way or two ways. One way flow results in approximately 5-6 vehicles per peak hour or 73 vehicles per day, and an access only to Hallie Lane for internal units would result in 11-14 vehicles per hour or 146 vehicles per day.

Parking

Units with garages will have a driveway suitable for one vehicle parking spaces. This includes the six units along the 3rd Street frontage and ten internal units. All other units will use an internal parking lot.

If the one-way westbound driveway aisle is utilized all vehicles parking internal to the site will enter on 3rd Street and exit to Hallie Lane. Signage in conformance with Manzanita Zoning Ordinance (MZO) 4.070 will be posted at the driveway way in alignment with Hallie Lane such as “Private Drive” to discourage cut-through vehicles and limit the impact on the existing Hallie Lane.

In order to prevent non-residents from using site parking along 3rd Street, signage in conformance with MZO 4.070 can be provided denoting they are “Private Parking Only”.

Vehicles parked in private spaces, whether internal to the site or along 3rd Street, will be subject to towing, although with the project design and current low demand for on-street parking on 3rd Street, it is unlikely this will be a concern. Signing can be added to alert non-residents their vehicles may be towed.

Garages and parking spaces will be provided off of 3rd Street for six units. Vehicles parking in these spaces will not need to use the site drive aisle or Hallie Lane to enter or leave the site. These vehicles will back up onto 3rd Street when leaving. These backing movements are typical for a low volume street such as 3rd Street. The proposed site plan includes only groups of four spaces, so meets the conditions of MZO 4.080

(10), which requires that groups of five or more parking spaces must be serviced by a driveway to avoid backing or maneuvering within the street.

Parking spaces along 3rd Street shall conform to MZO 4.020 "Clear Vision Areas" requirement in addition to adequate sight distance noted below.

3rd Street Configuration Options

The current right-of-way along 3rd Street is 10' wider than required by City standards. To the south, the offset is 10', but to the north it is 15' currently. The project is proposing to vacate the additional 10' to use for perpendicular parking on-site as described above. It is recommended the sidewalk be provided between the homes and these parking spaces to minimize conflicts with vehicles entering and backing from these spaces, providing a safter and more attractive facility for pedestrians.

An alternative configuration with the 10' vacation would be to move the units fronting the street to provide more parking spaces internal to the site, with only the garage driveways providing perpendicular spaces off the street and parallel parking on 3rd Street. This would free up parking on the street for use by all and provide a more typical streetscape. This would reduce the on-site parking by approximately 10 perpendicular spaces and add 2-4 interior spaces, for an overall reduction of 6-8 spaces. Approximately 5 perpendicular spaces on the street would be added along the site frontage.

Without the 10' vacation, there would be an offset from the back of the sidewalk to the property line that could be used for public parking, but would not count towards the site's required parking spaces. With the current right-of-way offsets the sidewalk would be significantly offset from properties to the north and south or would require the sidewalk be located behind the parking spaces.

Sight Distance Evaluation

Sight distance availability for the driveway and parking spaces on 3rd Street were found to exceed 250 feet in both directions. The roadway is straight and relatively flat.

At the existing intersection of Hallie Lane with Carmel, where some of the site trips will exit, sight lines are currently limited by vegetation and a fence to about 175 ft to the north. Trimming the vegetation at the northeast corner of the intersection will help improve sight lines and vehicles can pull forward at the bike and pedestrian path to see approaching vehicles over 225 feet away.

TABLE 4 – SIGHT DISTANCE EVALUATION						
Access	Design Speed (mph)	Design Vehicle	Recommended ISD (feet)	Required SSD (feet)	Available Sight Distance (feet)	
					To North	To South
3rd Street	20	Passenger Car	225	115	>250	>250
Hallie Lane	20	Passenger Car	225		175	>250

Parking Needs

The City of Manzanita Zoning Ordinance 4.090 requires a minimum of two parking spaces per dwelling unit. The proposed development will provide up to 52 spaces. The applicant requested an evaluation of reduced parking and requested an analysis of a parking ratio of as low as 1.5 per unit. The following section addresses the parking need for this project.

The site is planned to be small cottage/cabin type units with shared parking area for most and garages for 15 of the units. It is likely that one vehicle per unit will be parked given the small size of each unit and maximum of two bedrooms. The units are intended to be owner occupied as either primary or secondary residences. Any rentals would be subject to City requirements, which includes two parking spaces. Further, it is unlikely all units would be occupied at the same time, even on busy weekends, so with shared parking for many units, the number needed can be reduced.

Parking needs have been reviewed using the Institute of Traffic Engineers (ITS) Parking Generation Manual, 5th Edition, as well as the Urban Land Institute (ULI) Shared Parking, 2nd Edition and a survey of similar sites in Manzanita.

According to text in both the ULI Shared Parking manual (2nd Edition) and the ITE Parking Generation Manual (4th Edition), much of the recommendations for parking supply are based on vehicle ownership data as well as the number of bedrooms per dwelling unit. For example, parking demand rates for Single-Family Detached Housing (which is no longer provided in the Parking Generation Manual 5th edition) provide an average parking supply ratio of 2.0 spaces/DU based on study sites with an average of 2.7 bedrooms/DU and a 2000 census data estimate of 1.75 vehicles/household.

According to earlier editions of the ITE Parking Generation Manual, there is a correlation between the number of bedrooms and peak parking demand. Study sites with an average of less than 1.5 bedrooms/dwelling unit showed a peak parking demand at 92% of the average peak parking demand. This indicates that the Heron's Rest development, which is planned to contain only 1- and 2-bedroom units, may show peak parking demands lower than ITE estimates. With units are planned to be approximately 650 square-feet on average, they are likely much smaller than the typical single-family housing used in the parking surveys from ITE. It is likely that both the vehicle ownership rates and the bedroom/DU rates for these similar uses are not appropriate for the proposed Heron's Rest units which is more likely to be local residents or second homes and not vacation rentals.

In order to estimate the existing parking needs in the City of Manzanita, several similar sites were surveyed on the holiday weekends of Memorial Day and July 4th, 2022, to approximate the peak parking demand. The nearby developments surveyed include the Classic Street Cottages located at the corner of Classic Street and Dorcas Lane, the Classic Condos located on Classic Street less than a block north of the Classic Street Cottages, and the Pelican Perch Condos located on Pelican Lane. The existing parking supply was

counted, as well as the utilized parking spaces at four different times throughout the weekends, including late at night when vehicles are most likely to be parked at the site.

Because vehicles could not be counted in closed garage units, it was assumed a vehicle was parked in each garage. The following peak parking rates were observed on the holiday weekends:

- An average of 1.01 and a maximum of 1.09 parking spaces/unit at Classic Street Cottages
- An average of 0.92 and a maximum of 1.00 parking spaces/unit at Classic Condos
- An average of 0.60 and a maximum of 0.70 parking spaces/unit at Pelican Perch Condos

This observed data shows that the parking needs for similar residential development as Heron's Rest are significantly lower than the City's requirement of 2 spaces/unit. Because the surveyed sites are further from the amenities in town along Laneda Avenue, they may have higher vehicle use (parking and trip generation) than Heron's Rest. The proposed rate of as few as 1.5 spaces per unit is expected to be sufficient for even the peak holiday weekend demand.

VI. OPERATIONS ANALYSIS

Two aspects of operation analysis were evaluated for the study area intersections: 1) intersection operation analysis, which evaluates how well an intersection processes traffic demand; and 2) queuing analysis, which compares intersection queues with available storage for different travel lanes.

Intersection Operations Analysis

Intersection operations are generally measured by three mobility standards: volume-to-capacity (v/c) ratio, level-of-service (LOS), and delay (measured in seconds).

- V/C ratio is a measurement of capacity used by a given traffic movement or for an entire intersection. It is defined by the rate of traffic flow or traffic demand divided by the theoretical capacity calculated for the roadway geometry and traffic control.

- LOS is an expression of the average control delay (in seconds) experienced by drivers as described by a letter on the scale from A to F. LOS A represents optimum operating conditions and minimum delay, while LOS F indicates lengthy delays and often over-capacity conditions.

- Delay is a measurement of the average vehicle delay resulting from the type of traffic control and the conflicting traffic volumes. An average delay can be expressed for a certain movement, a specific lane, a single approach, or for an entire intersection.

Performance Measures

The Oregon Highway Plan (OHP) designates Highway 101 as a statewide highway that is Non-MPO outside of a Special Transportation Area. With a posted speed of 40 mph Table 6 of the OHP states the mobility target for the Highway 101 and Laneda Avenue intersection is a v/c ratio of 0.85 or less.

A portion of Laneda Way appears to be under the Jurisdiction of Tillamook County (2002 TSP) and all other roadways are under City jurisdiction, with no clear operational standards. It is assumed a level of service "D" or better would be sufficient for City intersections as well as the portion of Laneda under County jurisdiction.

Methodology

Intersection operations were analyzed with the use of Synchro 10 software, which utilizes the Transportation Research Board's *Highway Capacity Manual* (HCM) 2000, HCM 2010, and HCM 6 methodologies. All the study area intersections are stop controlled. HCM 2000 and 6 reports have been made available in the appendix.

Findings

The operation results for the intersection, the approach, and each lane group are presented in Table 5. Synchro output sheets are provided in the Appendix G.

TABLE 5 – PEAK HOUR INTERSECTION OPERATIONS				
Intersection (Control)	Peak Hour	Analysis Results (v/c-LOS-Delay in seconds)		
		2022 Existing	2024 Pre-Development	2024 Post-Development
Laneda Avenue/Carmel Avenue (Urban 3ST)	PM	0.20-A-8.4 WB	0.21-A-8.5 WB	0.21-A-8.6 WB
	Saturday	0.24-A-8.7 WB	0.26-A-8.9 WB	0.26-A-8.9 WB
Laneda Avenue/3rd Street (Urban 3ST)	PM	0.05-B-12.5 NB	0.05-B-13.0 NB	0.06-B-13.1 NB
	Saturday	0.05-C-17.9 NB	0.13-C-20.5 SB	0.13-C-21.0 SB
Laneda Avenue/Highway 101 (Rural 3ST)	PM	0.49-C-22.2 EBL	0.64-D-31.1 EBL	0.67-D-34.1 EBL
	Saturday	0.44-C-21.7 EBL	0.66-E-35.2 EBL	0.69-E-37.6 EBL
Carmel Avenue/Hallie Lane	PM	0.01-A-9.4 EB	0.01-A-9.8 EB	0.01-A-9.8 EB
	Saturday	0.01-A-9.9 EB	0.01-A-9.8 EB	0.01-B-10.0 EB
3rd Street/Site Driveway	PM	N/A	N/A	0.00-A-9.1 EB
	Saturday	N/A	N/A	0.00-A—9.9 EB

As presented in Table 5, all study area intersections currently operate within ODOT and City standards and are projected to continue meeting ODOT and County standards under post-development conditions.

Intersection Queuing Analysis

An intersection queuing analysis was conducted for the study area intersections during the PM peak hour and Saturday peak hour to evaluate any potential queue spillbacks. The 95th percentile queues were estimated using SimTraffic software. Queue demand results were rounded to the nearest 25 feet to represent average vehicle lengths.

Because queues are based on an average of five traffic simulations using random arrivals, some fluctuation in results can be anticipated, particularly for movements that are near or projected to be over capacity.

Methodology

Available queue storage lengths were estimated using Google Earth Pro software and rounded to the nearest five (5) feet. For turn lanes, two available storage values are stated: the first represents the striped storage; the second is the effective storage, or the length physically available regardless of striping, such

as a center turn lane upstream of a striped left-turn lane at an intersection. Although through lanes have no storage defined by striping, two values are reported for storage: the first is the distance to an upstream driveway; the second is the distance to an upstream public street intersection.

Findings

The PM peak hour and Saturday 95th percentile queues are presented in Table 6. Bold text indicates the calculated queue exceeds the storage for the travel lane. SimTraffic output sheets are provided in Appendix H.

TABLE 6 – 95TH PERCENTILE QUEUING ANALYSIS

Intersection (Control)	Approach/ Movement	Available/ Effective Storage (feet)	PM/Saturday Queue (feet)		
			2022 Existing	2024 Pre-Development	2024 Post-Development
Laneda Avenue/Carmel Avenue (Urban 4ST)	EB	20/425	75/75	75/75	75/75
	WB	100/+500	75/100	75/100	75/125
	NB	175	75/75	75/75	75/75
	SB	30/450	25/50	25/25	25/50
Laneda Avenue/3rd Street (Urban 3ST)	EB	150/+500	25/50	25/50	25/50
	WB	90/175	50/50	50/50	50/50
	NB	40/+500	50/25	50/25	50/50
	SB	75/425	50/50	50/50	50/50
Laneda Avenue/Highway 101 (Urban 3ST)	EBL+R	150/380	150/100	175/175	175/175
	NBL	150/185	75/75	75/100	75/75
	NBT	+500	N/A	N/A	N/A
	SBT+R	300	25/25	25/25	25/25
Carmel Avenue/Hallie Lane (Urban 3ST)	EB	15/250	25/25	25/25	25/25
	WB	70/300	25/25	25/25	25/25

3ST – Three-way Stop-Controlled
4ST – Four-way Stop-Controlled

As presented in Table 6, all existing and future conditions queues are expected to be accommodated by available storage.

VII. TRANSPORTATION DEMAND MANAGEMENT

The city has requested transportation demand management measures be considered for the site in order to reduce the number of vehicle trips generated. The intent of the project is to provide homes that are smaller than and below the current median prices of other homes in Manzanita. With smaller, more affordable homes, it is anticipated a larger percentage will be occupied by full time residents than other homes in the area, and would have fewer residents and vehicles per unit.

In addition to the characteristics of the homes being suited to fewer trips, Transportation Demand Management (TDM) measures can be used to encourage alternate modes such as walking and biking to further reduce vehicle trips. While most TDM measures such as transit use, work from home, and flexible shifts, apply to businesses, there are some that can be applied to residential uses.

The project is located two blocks south of Laneda Street, which is a walkable street and sees the most pedestrian traffic of any area in the City. Residents can easily walk to grocery, shopping and restaurants, as well as the beaches to the west.

Sidewalks will be provided along 3rd Avenue and within the site to further encourage walking and provide a convenient connection to Laneda Street. Bicycle parking spaces will be provided at the site for residences without garages, allowing bicycles to be secured. Providing convenient and safe parking for bicycles will encourage their use for trips around town.

By not providing dedicated parking spaces for many of the homes, residents will be less likely to use their vehicles for shorter trips due to the potential loss of a preferred parking space. This will encourage trips to be taken by walking or riding bicycles.

Way-finding signs can be added on-site to direct pedestrians and bicycle riders to local amenities and businesses.

Because a homeowner's association will be established for the residential units, the HOA may choose to provide other amenities that would encourage reduced vehicle use.

VIII. MITIGATION AND RECOMMENDATIONS

All study area intersections are expected to operate at acceptable levels per ODOT and City standards with the addition of site trips, and vehicle queues will not exceed available storage.

Pedestrian and bicycle facilities in the project area will encourage use of these alternate travel modes and help to reduce the slight impact that peak hour vehicle travel will have on 3rd Street or Hallie Lane.

The paved conditions of 3rd Street should be capable of handling the additional vehicular traffic from the proposed development. Hallie Lane is currently unpaved, and if the site was in a normal urban/suburban area, it would be expected to experience 60 daily trips. This would be approximately five (5) trips an hour, if it is assumed they occur during half (12 hours) of the day. However, considering that most residents of the proposed development will predominantly travel using alternative modes, the undeveloped conditions of Hallie Lane should be able to withstand the minor increase in daily trips. Therefore, we are not recommending improvements to 3rd Street or Hallie Lane.

Sight distances from the driveways and parking spaces on 3rd Street are available in excess of 250 feet. At the intersection of Hallie Lane with Carmel, vegetation at the northeast corner could be trimmed to improve sight distance to the north.

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