Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

700 NE MULTNOMAH, SUITE 1000 | PORTLAND, OR 97232 | P 503.233.2400, 360.694.5020

DRAFT TECHNICAL MEMORANDUM

DATE:	June 30, 2021
TO:	Jeff Adams and Karen LaBonte, City of Cannon Beach
FROM:	Eddie Montejo, Emily Welter, and Ryan Farncomb, Parametrix Owen Ronchelli, Rick Williams Consulting
SUBJECT:	DRAFT Tech Memo #4: Future Needs and Deficiencies
CC:	Michael Duncan, ODOT
PROJECT NUMBER:	274-2395-113
PROJECT NAME:	Cannon Beach TSP

Contents

INTRODUCTION

This memorandum documents the future conditions of the Cannon Beach transportation system, using a planning year of 2040. The analysis considers the likely future conditions of the transportation system under a Future No Build condition. In other words, what the future transportation system would look like assuming the existing system plus projects that are planned and funded or are otherwise very likely to be implemented. Future conditions are considered in the context of likely future growth in transportation demand, population growth, and changes in land use. Future conditions will identify likely future deficiencies in the City's transportation system for all modes, including automobile, bicycle, pedestrian, freight, and emergency response and evacuation.

The future conditions analysis will inform the next stage of the TSP, providing a baseline for comparing the development of draft solutions.

FUTURE POPULATION, TRANSPORTATION, AND LAND USE ASSUMPTIONS

Future Population

Every year, Portland State University's Population Research Center publishes current and forecast population data for all communities in Oregon. Table 1 below summarizes the most recent population forecast for Cannon Beach, which shows that Cannon Beach's population is forecast to grow to 1,714 people by 2040. This represents a modest a 3.4 percent increase over the 2020 population of 1,652. The City is expected to grow more slowly than Clatsop County as a whole. The State of Oregon is expected to grow approximately five times faster than the City of Cannon Beach during the same period.

Table 1. Future Population (2020 - 2040) [1]

Jurisdiction	2020	2040 (Forecast)	Percent Change
Cannon Beach	1,652	1,714	+3.8%
Clatsop County	38,254	40,010	+4.6%
Oregon	4,266,184	5,100,899	+19.6%

Transportation

Roadway Network

The Future No Build traffic analysis accounts for completed or planned transportation improvements that have an identified and committed funding source. Since there are no planned and funded projects within the Cannon Beach UGB, no changes were made to the roadway network for traffic modeling. Future No Build traffic volumes

[1] Proposed Population Forecasts prepared by: Population Research Center, Portland State University, June 30, 2020. Proposed forecasts represent populations as of July 1 of each year.

were developed used a linear growth rate. Trip generation was not needed since there are no planned and funded developments. Travel demand modeling was also not needed since there are no major land use changes.

Bicycle and Pedestrian Network

The Cannon Beach Parks Master Plan (2017) recommends several projects related to the bicycle and pedestrian networks. However, these projects are not funded. Without funding, projects are unlikely to be built and the future bicycle and pedestrian networks will remain the same. Gradual increases in population, tourist demand, and traffic could impact bicycle and pedestrian safety in the future.

Sidewalks

The future sidewalk system in Cannon Beach is anticipated to be the same as existing, with sidewalks limited to the City's commercial areas. The Parks Master Plan recommends a future sidewalk along Spruce Street between Monroe and the public restroom. However, this project is currently unfunded.

Crossings

There are no planned crossing improvements in Cannon Beach, so future crossing conditions are expected to be the same as existing. Most pedestrian crossings would remain unsignalized, without pedestrian push buttons, and with minimal levels of physical protection from traffic. Many crossings would remain deficient or missing throughout the City.

Accessibility

There are no current plans to expand curb ramp installations or other ADA improvements in the City. Therefore, it is anticipated that future accessibility conditions will be the same as existing with most curb ramps remaining uncompliant with ADA standards. Crossing deficiencies would remain throughout the City and along main thoroughfares like Sunset Boulevard.

Lighting

Future streetlighting is anticipated to be the same as existing, with most lighting concentrated in commercial areas and dispersed lighting in certain residential areas. There are no current plans to install future street lighting, and the City has also adopted a "dark sky" ordinance limited new streetlighting to downcast lights and requiring all new commercial lighting to be reviewed and approved by the City Development Review Board. As such, most new lighting in the future is anticipated to be driven by development on a project-by-project basis.

Transit System

Currently, there are no funded improvements to enhance or expand the transit system in Cannon Beach. The Sunset Empire Long Range Transit Plan (LRTP) does include long-range recommendations for improving transit service in Cannon Beach, although these recommendations are not currently funded. Therefore, LRTP improvements are not included in the Future No Build scenario.

Future Traffic Volumes

Design Hour Volumes (DHV) are based on the existing year volumes developed during the Existing Conditions analysis. The DHV is generally defined as the future year 30th highest hour (30 HV).

Future traffic forecasts for the horizon year 2040 were developed using a linear growth factor for all movements. This growth factor was calculated using 2018 and 2039 volumes provided in the *ODOT Future Highway Volume Table*. Based on these volumes along US 101 at MP 29.68, the average annual growth rate for the study area is +1.23%. An overall growth rate of +24.6%, or +1.23% over 20 years, was applied to all 2020 30 HV intersection volumes to develop the 2040 DHV.

Additional information regarding analysis procedures is documented in the Methods and Assumptions Memorandum. The peak hour intersection volumes for the 15 study intersections are shown in Figure 1 and Figure 2 below.

Figure 1. Peak Hour Intersection Volumes (page 1 of 2: north)

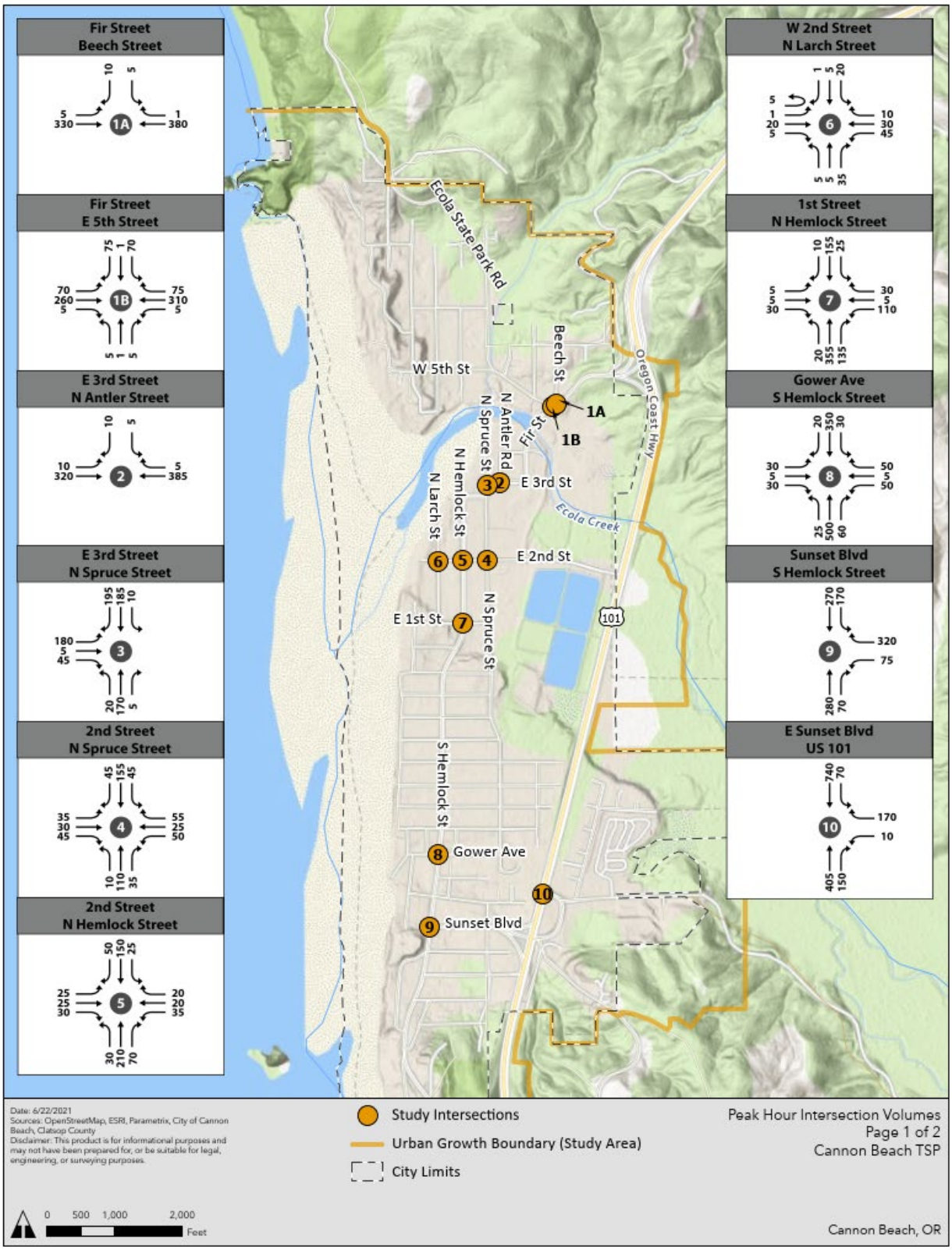
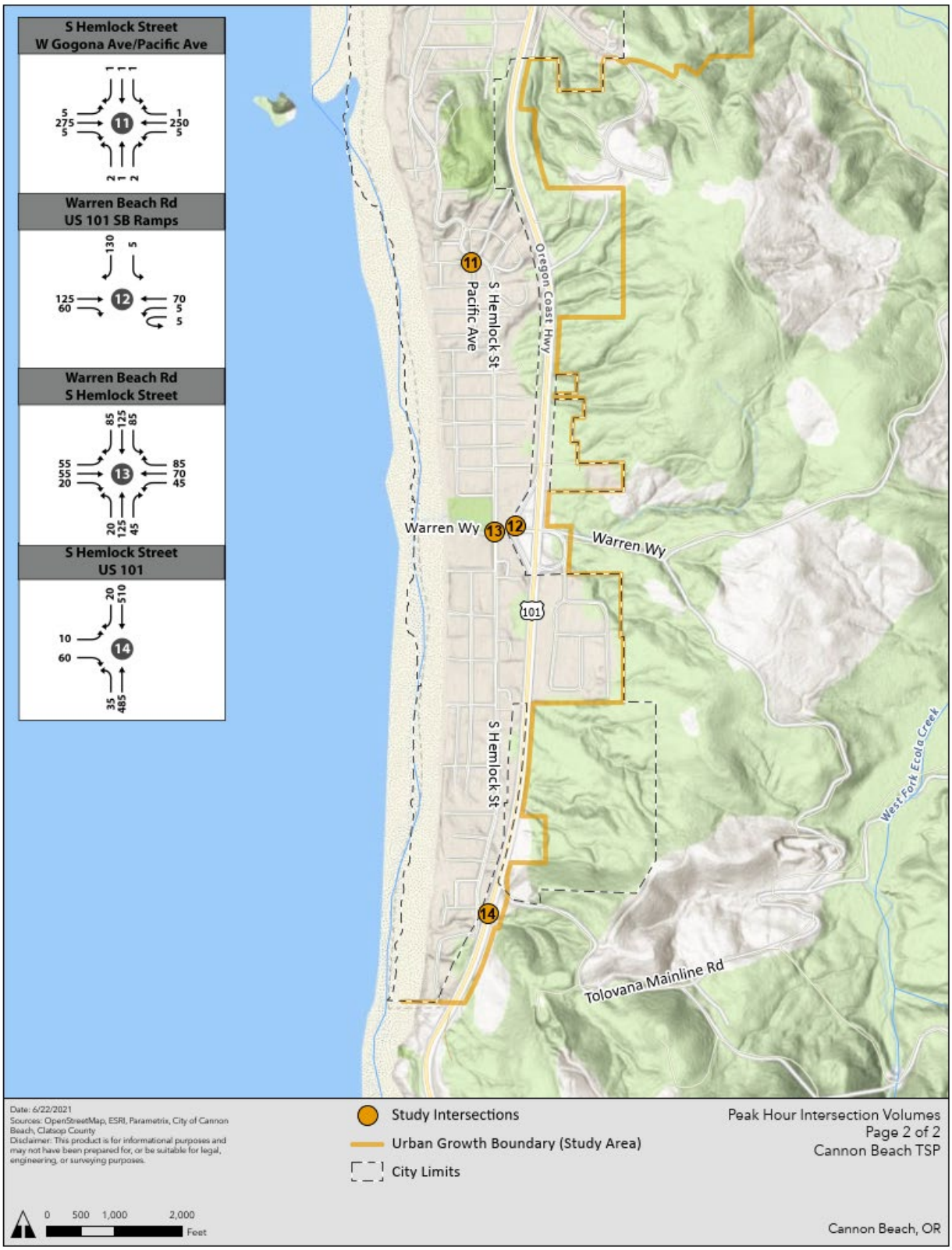


Figure 2. Peak Hour Intersection Volumes (page 2 of 2: south)



FUTURE DEFICIENCIES

Future Roadway Deficiencies

Traffic Operations

State highway mobility targets were developed for the 1999 Oregon Highway Plan (OHP) as a method to gauge reasonable and consistent targets for traffic flow along state highways. The mobility targets are based on volume-to-capacity (v/c) ratios and are shown in Table 2.[2] Additional information regarding intersection mobility targets is documented in the *Methods and Assumptions Memorandum.*

Level of service (LOS) is another metric that describes how well an intersection operates. Intersections receive a LOS grade from "A" to "F", where LOS "A" represents the best conditions with minimal delay at the intersection and LOS "F" represents the worst conditions. The City of Cannon Beach has not adopted LOS standards.

Traffic operations for the 15 study intersections were analyzed using Synchro and SimTraffic.[3] V/c ratios, delay, and LOS were reported using HCM 6th Edition reports for both all-way stop-controlled and two-way stop-controlled intersections. All 15 of the study intersections are unsignalized, so the v/c ratios and delays were reported for the worst movement. V/c ratios for the mainline at two-way stop-controlled intersections were calculated based on ODOT APM guidelines.

V/c ratios, delay, and LOS are summarized in Table 2. There are three intersections that are expected to operate with v/c ratios that exceed the mobility targets: N Hemlock Street/2nd Street, N Hemlock Street/1st Street, and S Hemlock Street/Sunset Boulevard. For all three intersections, the mainline street (N Hemlock Street) is expected to operate with a v/c ratio less than 0.95, but the side streets are expected to operate with a v/c ratio greater than 0.95. This is likely due to the nearly 25% increase in volume along N Hemlock Street by year 2040 that is causing longer delays for the side streets.

The 95th percentile queue lengths were analyzed using SimTraffic. Similar to Existing Conditions, the only queue length that is expected to exceed the storage length or space between intersections is the westbound approach at the intersection of E 5th Street & Fir Street which is estimated to be 70 feet, with an intersection spacing between Fir Street and Beech Street that is less than 50 feet.

Synchro and SimTraffic reports are available in the *Appendix A: SimTraffic and Synchro Reports.*

[2] Note: As of this writing, the City of Cannon Beach does not have adopted mobility standards. ODOT mobility standards apply on the US 101 and at the interchanges. If adopted, future City mobility standards could accept higher v/c ratios than what ODOT currently accepts on the state highway system. Therefore, ODOT mobility standards are applied as proxies for the City's own future standards for analysis purposes only.

[3] Synchro and SimTraffic refer to traffic modeling software.

Table 2. Future No Build 2040 Traffic Operations – V/C Ratio, Delay, and LOS

			Mainline Operations			Side Street Operations			
#	Intersection	Future No Build Mobility Target	v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	Exceeds Mobility Target?
1A	Beech Street & Fir Street	v/c < 0.95	0.20	8	A	0.03	13	B	No
1B	E 5th Street & Fir Street	v/c < 0.95	0.54	13	B	0.24	10	B	No
2	N Antler Street & E 3rd Street	v/c < 0.95	0.20	9	A	0.04	15	B	No
3	N Spruce Street & E 3rd Street (southern intersection)	v/c < 0.95	0.56	14	B	0.39	12	B	No
4	N Spruce Street & 2nd Street	v/c < 0.95	0.37	11	B	0.21	9	A	No
5	N Hemlock Street & 2nd Street	v/c < 0.95	0.16	10	A	1.12	245	F	Yes
6	N Larch Street & W 2nd Street	v/c < 0.95	0.08	9	A	0.12	15	B	No
7	N Hemlock Street & 1st Street	v/c < 0.95	0.23	11	B	0.98	126	F	Yes
8	S Hemlock Street & Gower Avenue	v/c < 0.95	0.32	9	A	0.72	72	F	No
9	S Hemlock Street & Sunset Boulevard	v/c < 0.95	0.32	9	A	0.96	64	F	Yes
10	US 101 & E Sunset Boulevard	v/c < 0.80	0.50	8	A	0.34	15	B	No
11	Pacific Avenue/W Gogona Avenue & S Hemlock Street	v/c < 0.95	0.17	8	A	0.01	13	B	No
12	US 101 Southbound ramps & Warren Beach Road	v/c < 0.80	0.05	0	A	0.15	10	B	No
13	S Hemlock Street & Warren Beach Road	v/c < 0.95	0.14	8	A	0.52	26	D	No
14	S Hemlock Street & US 101	v/c < 0.80	0.32	9	A	0.17	15	B	No

Peak of the Peak Analysis

Per the *Methods and Assumptions* and *Technical Memorandum #3: Existing Conditions,* the baseline traffic conditions (existing) that were used to derive future traffic conditions are based on 16-hour traffic counts collected in July 2020. Considering the counts were collected for this analysis in 2020, the impacts of COVID-19 on typical traffic volumes were assessed by comparing the 2020 traffic counts to comparable 2019 data provided by ODOT. Comparing these volumes, on average the 2020 volumes were 93.3% of the 2019 volumes, with a change from 2019 to 2020 of -6.7%. To account for this change in volume due to COVID-19, a factor of 1.072, or 100% divided by 93.3%, was applied to the July 2020 counts to determine typical 2020 intersection volumes that also accounted for the effects of the pandemic.

In July 2021, ODOT authorized the collection of additional 16-hour weekday and weekend intersection counts at Hemlock and Sunset, along with volume only (directional) counts on US 101. The purpose of these additional counts was to test the accuracy of the previously used adjustment factor of 1.072 and to make any needed adjustments to best reflect actual traffic and pedestrian conditions. More importantly, these additional traffic counts were taken with the community in mind, to ensure the project is sharing the best possible data with the public. These additional counts are discussed in more detail in *Appendix B: Peak of the Peak Analysis.*

Street Network/Connectivity

Hemlock Street and US 101 run parallel to each other and are about 400 to 1600 feet away from each other depending on the location. Given this proximity, there is not much need for an additional north-south corridor. The interchange spacing along US 101 is already exceeding standards, so another interchange is not needed to provide more east-west connections to Hemlock Street.

West of US 101, there is only one roadway crossing the creek between Beaver Street and E 5th Street. There may be interest in providing a more direct connection between N Spruce Street and Ecola State Park Road, especially since Ecola Park is a popular destination.

Geometric

Since there are no planned and funded projects to account for in the Future No Build Conditions, the geometric deficiencies are the same as those outlined in the Existing Conditions memo.

Access Management

Since there are no planned and funded projects to account for in the Future No Build Condition, the interchange spacing, and access spacing deficiencies are the same as those outlined in the Existing Conditions memo.

Pavement Management

Data on the current conditions of the City's pavement system is limited. It is expected that the City will continue to maintain pavement on an as-needed basis, particularly key commercial segments along Hemlock. Other pavement improvements may be triggered by private development on an ad-hoc basis.

The Oregon Department of Transportation does have a funded and planned project to repave the US 101 corridor through Cannon Beach from Ecola Creek to Arcadia Beach, scheduled to go into construction in 2022. Therefore, future pavement conditions along US 101 are expected to be very good, while the local pavement system is likely to be similar to existing.

Safety

The Oregon Department of Transportation has a planned and funded project to install chevrons and update curve warning signs and advisory speed plaques at various locations along the US 101 corridor to improve safety, including through Cannon Beach. The project is scheduled for construction in 2021-2022. Future safety conditions through curves are expected to improve along US 101 in the future.

Future Parking Utilization

Future parking conditions are based upon examination of several key factors, including anticipated population and future tourist demand, forecast traffic demand, and future land use assumptions. As documented in *Technical Memorandum #3: Existing Conditions*, there are currently no adopted plans to expand on- or off-street parking within Cannon Beach. Therefore, future parking conditions are generally expected to be the same as existing.

Any significant changes to future parking capacity will be driven primarily by private development and/or redevelopment on project-by-project basis. Due to a limited supply of developable land, redevelopment projects in Cannon Beach will likely have to provide onsite parking to support newly generated demand in the form of structured parking, resulting in significant increases to project costs.

Future parking utilization will be primarily driven by future development activities, which will increase the overall demand for both on- and off-street parking in town. Without development, parking supply will stay the same and use of existing parking stalls will increase gradually over time as a result of minor population growth and future tourist travel. These future demands are anticipated to worsen peak-hour parking constraints along Hemlock and Spruce Streets, as well as other commercial corridors in town, especially without parking management strategies and periodic enforcement. However, near and mid-term future parking demand is not anticipated to exceed the City's overall existing supply of combined (on- and off-street) parking capacity on a regular basis, as future parking constraints are expected to be concentrated during peak visitor periods.

Future Pedestrian and Bicycle System Deficiencies

Pedestrian and Bicycle Facilities

The future sidewalk system in Cannon Beach is anticipated to be the same as existing, with sidewalks limited to the City's commercial areas. Under Future No Build conditions, Cannon Beach would still lack a designated network or master plan for biking, despite it being a policy objective in the Comprehensive Plan. Hemlock Street, where most commercial destinations are located, would still lack a consistent bike facility or nearby, citywide parallel facility. This is most pronounced north of 1st Street where Hemlock Street does not have bike lanes and there are no parallel routes. Segments of US 101 have shoulders than are narrower than ODOT standards.

Hemlock Street and US 101 would continue to be the only two options for bicycle crossing Haystack Hill to go between the north and south portions of the City. Neither option is ideal as an all ages and abilities bike facility. US 101 has heavy, fast moving traffic and Hemlock Street is hilly and windy with narrow shoulders. The route to Ecola Park Road would lack a bike facility and the City would lack bicycle wayfinding.

Pedestrian and Bicycle Level of Traffic Stress

An assessment of level of traffic stress (LTS) was conducted for the City's existing bicycle and pedestrian systems based on the *ODOT Analysis Procedure Manual, Chapter 14*. The assessment considers the quality and comfort of

routes between origins and destinations to determine a generalized four-level LTS rating of excellent (1), good (2), fair (3), or poor (4). These ratings provide a measure of actual and perceived safety and comfort for people travelling along a particular street segment within the City, based on factors such as the presence and quality of bicycle/pedestrian facilities, speed limits, traffic volumes, barriers, and other measures. These analysis factors were adapted to meet the local context of Cannon Beach's existing street system and are based on available data for the City.

LTS was only evaluated on arterial and collector streets in the City; Hemlock and US 101 are the only roadways in the City that meet these categories, so they were the only facilities analyzed. Given that there are no funded improvements to the bicycle and pedestrian systems, future LTS is expected to be the same as existing.

Pedestrian Level of Traffic Stress

Results from the pedestrian LTS assessment are equal to those described in *Technical Memorandum #3: Existing Conditions* and are displayed here in Figure 3 and Figure 4. Conditions along Hemlock Street are expected to range from 2 (good) to 4 (poor). This range is largely dependent upon the quality of pedestrian facilities present and the posted speed limit.

North of Sunset Boulevard, Hemlock Street has sidewalks and crossings, consistent illumination, and the speed limit is 25 mph or less. This corresponds to an LTS level 2. The rating here would be a 1 (excellent), if sidewalks were separated from the roadway with landscape or other physical buffers.

South of Sunset Boulevard, Hemlock Street does not have sidewalks and the speed limit increases to 30 miles per hour. It also has less illumination and fewer crossings. This segment is rated 4 (poor). To walk or use a mobility device here, people will need to use the shoulders that are also shared with parked cars and people biking. The expected future increase in motor vehicle traffic may exacerbate the stress of travelling this segment.

A small segment of Hemlock Street at Sunset Boulevard is rated as LTS level 3 (fair) because of the presence of sidewalks, the transitional speed limit from 25 to 30 miles per hour, and the volume of traffic at the intersection.

Figure 3. Pedestrian Level of Traffic Stress (page 1 of 2: north)

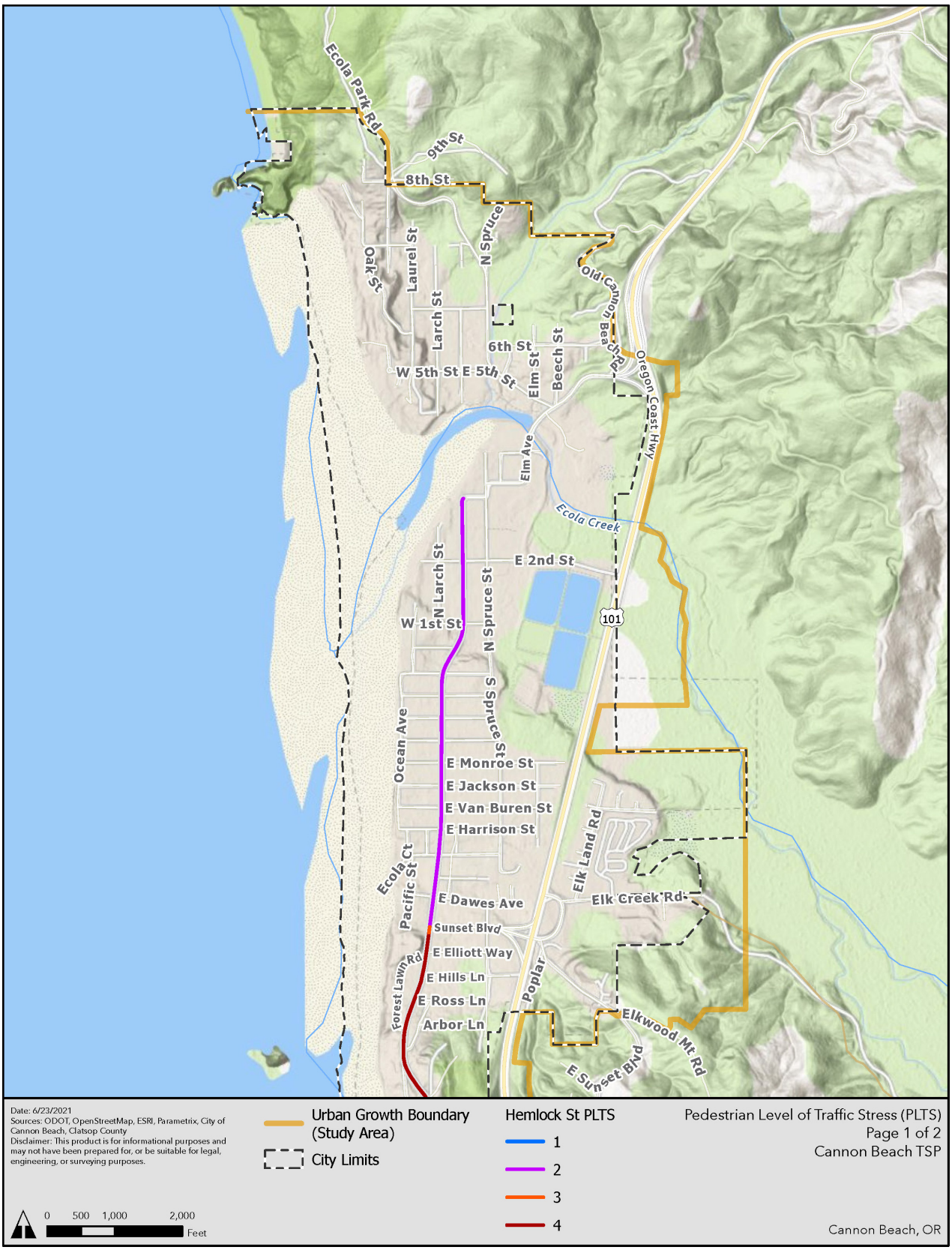
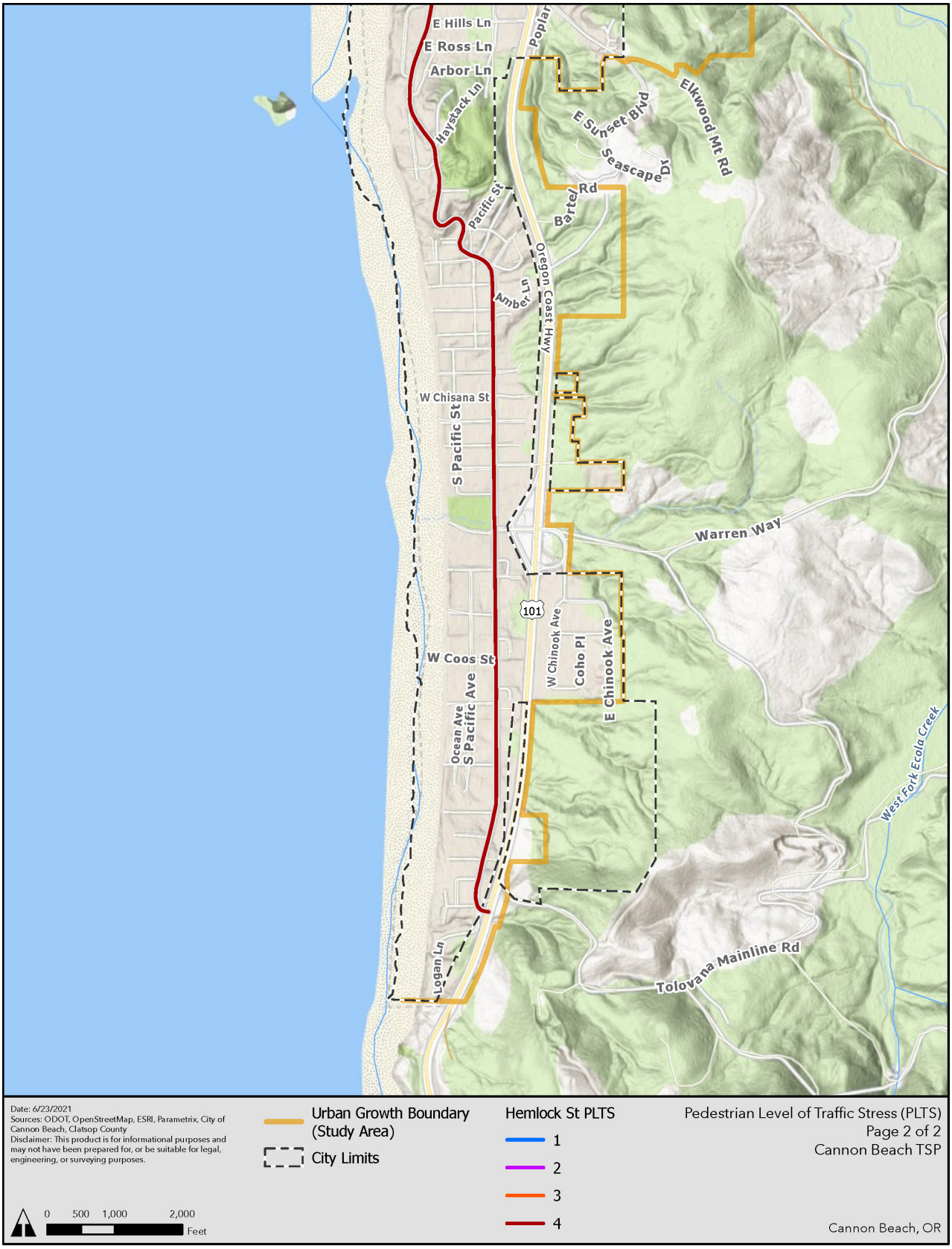


Figure 4. Pedestrian Level of Traffic Stress (page 2 of 2: south)



Bicycle Level of Traffic Stress

Results from the bicycle LTS assessment are equal to those described in *Technical Memorandum #3: Existing Conditions* and are displayed here in Figure 6 and Figure 7. Conditions on Hemlock Street ranges from LTS level 1 (excellent) to level 3 (fair), with most of the street at level 2 (good).

The lowest stress area is identified between Gower Street and Sunset Boulevard, where there are dedicated 6-foot bike lanes and traffic speeds of 25 miles per hour or less. The highest stress segments are found in areas with a combination of a lack dedicated bike lanes or shoulders, heavy traffic, challenging topography, and/or limited sight lines. These higher stress areas are explored in more detail below. The remaining segments of Hemlock Street are rated as LTS level 2 because they have 5-foot to 6-foot shoulders, relatively flat terrain, and relatively good visibility.

North of 1st Street, Hemlock Street is assessed to have an LTS level 3. There are no bike lanes or shoulders here, requiring biking in a mixed environment with auto traffic. Parking is on both sides of the street and this is a busy part of Cannon Beach's downtown commercial area. The combination of people driving, parking, and opening car doors create a relatively stressful environment for biking.

Figure 5. Northbound Shoulder Disappears North of Harrison Street *(Google Streetview)*

South of 1st Street, the bicycle facility improves with shoulders or bike lanes for most of the way until reaching the curves near Ross Lane. However, the northbound shoulder disappears for a short segment between Harrison and Van Buren Streets, as seen in Figure 5. The transition forces people biking to abruptly merge with motor vehicle traffic, elevating this to an LTS level 3.

The curves near Haystack Hill, approximately between Ross Lane and Gulcana Avenue, is assessed as an LTS level 3. The segment has narrow shoulders, substantial incline, limited sight distances, inconsistent illumination, and a 30 mile per hour posted speed limit. The shoulders are narrow in places or can be occupied with parked cars or pedestrians, forcing people on bikes to mix with car traffic. There is a large difference in speeds between a car driving at the speed limit and a person biking slowly up the hill. The curves limit sight distances and inconsistent illumination reduce visibility after dark. These factors all contribute to the LTS rating.

Similarly, the south curve Hemlock Street makes connect with US 101, south of Watts Way, is assessed at an LTS level 3. This short segment has narrow shoulders and limited sight distance, while also connecting with fast moving traffic on US 101.

Figure 6. Bicycle Level of Traffic Stress (page 1 of 2: north)

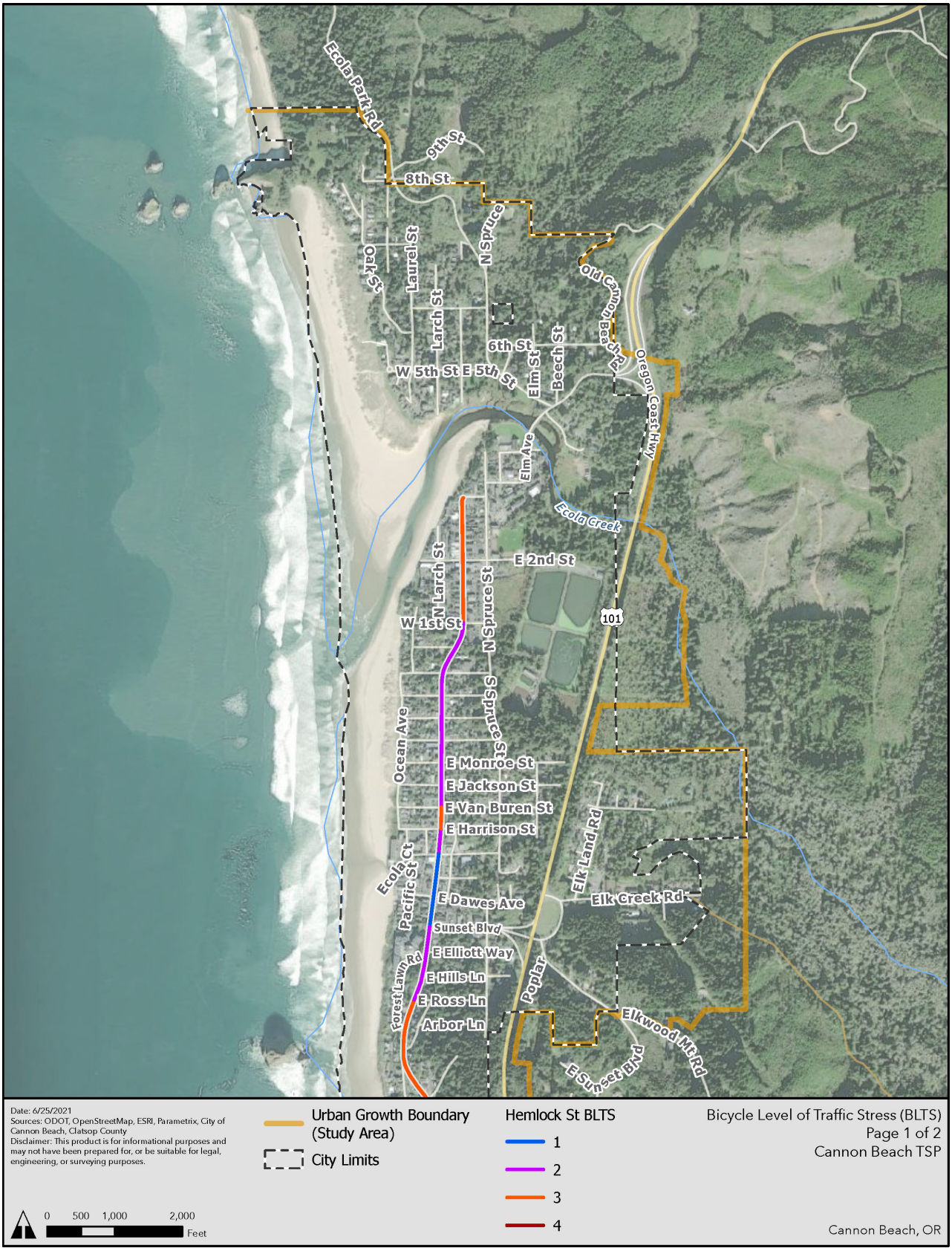
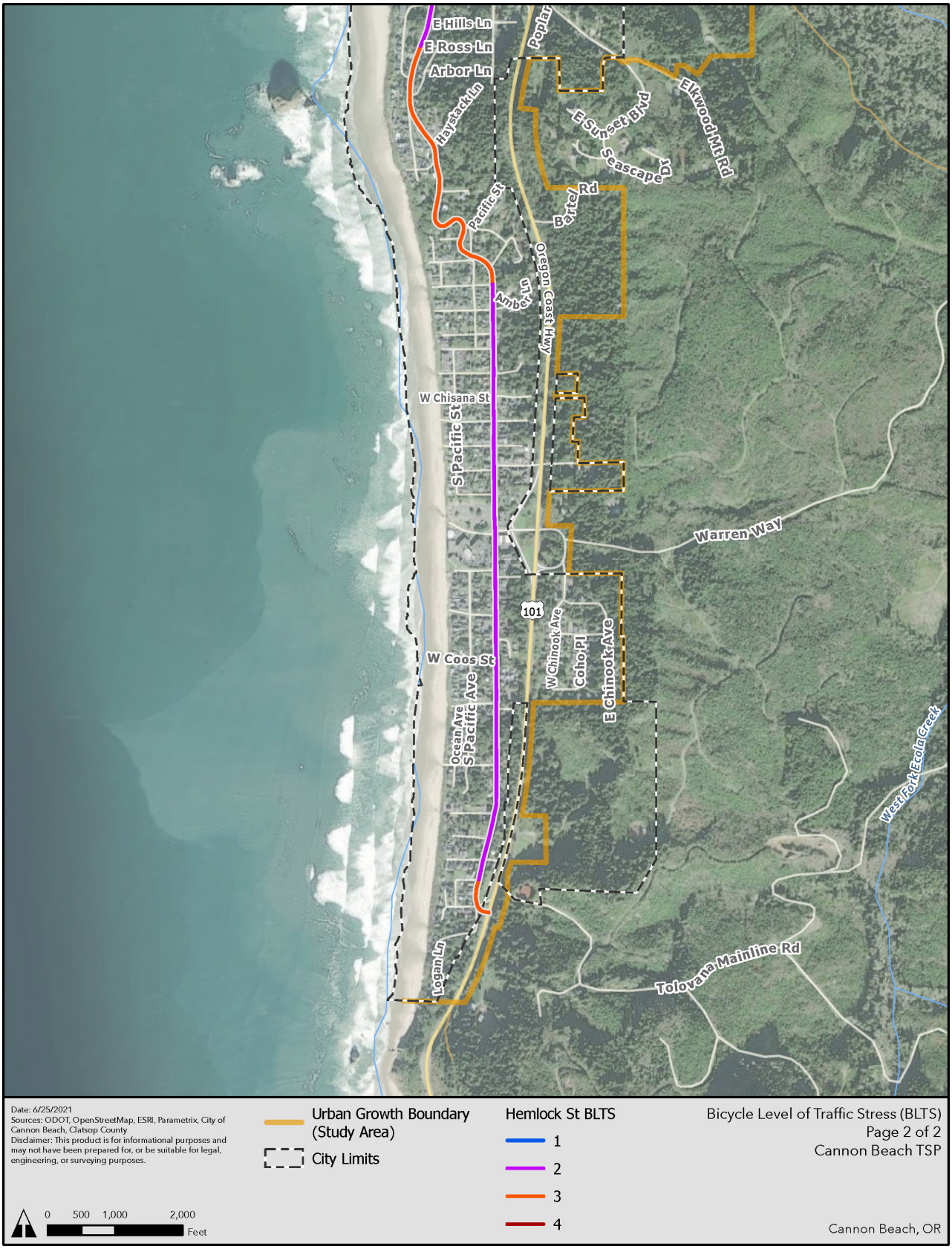


Figure 7. Bicycle Level of Traffic Stress (page 2 of 2: south)



Future Transit Deficiencies

Given that planned transit improvements in the SETD LRTP are unfunded, future transit system in Cannon Beach is likely to operate the same as existing with infrequent service and limited service hours. Infrequent service and limited service hours may make transit an impractical option for those who would prefer to use it. If implemented, LRTP recommendations would provide only small improvements for Cannon Beach and would not increase frequency for local or intercity travel. With or without these planned improvements, local transit service deficiencies are expected to grow as the population ages and as traffic volumes grow incrementally year-over-year.

Future Truck Freight Deficiencies

Truck mobility needs in Cannon Beach are expected to remain relatively modest because of the limited manufacturing and intermodal shipping in the City. Cannon Beach has no plans to grow industries with heavy freight requirements, and no projects are planned to expand truck mobility in the City. Therefore, truck mobility needs are expected to grow incrementally along with increases in population and in e-commerce and future needs will likely be the same as current needs. Trucks will need continued access to commercial areas and industrial areas. Additionally, delivery trucks will need places to park while delivering. The few designated loading zones in commercial areas are likely insufficient to provide efficient deliveries without blocking other travelers on the road.

Emergency Response and Evacuation

Emergency response needs are expected to remain consistent through the horizon year. Emergency response will continue to need access throughout the City and access to the nearest hospital in Seaside.

Similarly, evacuation needs are expected to stay the same through the horizon year. Much of Cannon Beach is within the inundation zone, based on analyses by Oregon Department of Geology and Mineral Industries (DOGAMI). Evacuation routes need consistent wayfinding and signage that are effective in communicating to residents and visitors.

Future Bridge Deficiencies

Two bridges built in 1952, one over Ecola Creek (06713) and one over Warren Street (#07405), are rated “fair.” Though they are acceptable now, they may need refurbishment or replacement by 2040.

Air, Marine, and Rail Deficiencies

Cannon Beach has no airports, no commercially navigable waterways, no railroads, and has no plans to develop them.

FUNDING

Future transportation funding is likely to be deficient in Cannon Beach. Based on a review of Road Fund expenditures and revenues, funds available for transportation capital improvements have reduced by an average of 18 percent between 2016 and 2021 (Table 3). Local funding is expected to stay the same into the future unless the City develops new funding streams. Considering the identified existing and future transportation deficiencies within Cannon Beach, it is unlikely that the City will be able to substantially invest in transportation system improvements without seeking out external funds from county, state, or federal sources.

Table 3. Road Fund Expenditure Summary (2016–2021)

	2017	2018	2019	2020	2021 (Adopted)
Beginning Fund Balance	$52,200	$154,883	$235,927	$331,560	$400,000
Revenues	$877,515	$924,805	$792,768	$925,570	$675,364
Expenditures	$774,832	$843,761	$697,135	$784,864	$1,075,364
Bridge Reserve Fund	$8,592	$8,592	$8,592	$8,592	$8,592
Total funds potentially available for capital improvements*					
	$163,475	$244,519	$340,152	$480,858	$8,592
Percent Change		+50%	+39%	+41%	-98%
5-Year Average					+8%

*This represents annual the remaining Road Fund and Bridge Reserve Fund monies that are potentially available for use capital improvement projects.

APPENDIX A: SYNCRHO AND SIMTRAFFIC REPORTS

APPENDIX B: PEAK OF THE PEAK ANALYSIS