

TECHNICAL MEMORANDUM

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SUBJECT: FINAL Tech Memo #3: Existing Conditions Inventory and Analysis

CC: Michael Duncan, ODOT

PROJECT NUMBER: 274-2395-113

PROJECT NAME: Cannon Beach Transportation System Plan (TSP)

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INTRODUCTION

This memorandum reviews existing transportation conditions in the City of Cannon Beach. The review considers the City's land use, population, and transportation network and facilities for use in the development of the Cannon Beach Transportation System Plan (TSP). This memorandum inventories the existing conditions and current standards to understand current transportation system needs. All modes of transportation are analyzed, including streets and roadways, pedestrian and bicycle facilities, public transportation, and rail. The analysis will be used to identify potential deficiencies and help inform the development of future solutions.

Needs Summary

Community and Population

- Cannon Beach has greater shares of people with lower incomes, people with disabilities, and older adults. For example, the City has a lower median household income (\$50,846) and a higher portion of people with low incomes (49 percent) than either the broader Clatsop County or the State of Oregon. A larger proportion of people in Cannon Beach live with a disability (25 percent) than either the County or the State.
- Residents of Cannon Beach tend to have less access to motor vehicles (11 percent) and are less likely to drive to work than residents of the broader Clatsop County or State of Oregon. They also have shorter commute times, at 10 minutes versus over 20 minutes for the County and the State.
- A relatively high number of households with limited English proficiency (4%) suggests making information available in Spanish would benefit many of the people in Cannon Beach.

Streets/Bridges

- The City's existing sidewalk policy and municipal code prioritize the preservation of a "rustic" or village-like aesthetic for the City's local streets. As such, most local streets are narrow and without sidewalks. Most of the City's street system is comprised of local streets.
- Existing policies have preserved US-101 as a two-lane, forested corridor. The City has prioritized minimizing commercial development adjacent to US-101 and limiting the number of access points onto the highway.
- The City contains no traffic signals. Traffic is controlled by stop signs at major street intersections.
- The only queue length that exceeds 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, but the intersection spacing between Fir Street and Beech Street is less than 50 feet.
- Beech Street north of Fir Street currently does not meet Cannon Beach local street width standards.
- US 101 within the Cannon Beach UGB does not meet interchange spacing or access spacing standards for a statewide highway with an AADT greater than 5,000 as outlined in the *Oregon Highway Plan*. The existing interchange spacing of 1.07 miles does not meet standards of 3 miles and the existing access spacing of 890 feet does not meet of 1,320 feet.

Traffic Operations

- No intersections on ODOT facilities exceed state mobility standards as outlined in the *Oregon Highway Plan*. However, two intersection on the local system do operate at LOS F: N Hemlock Street/2nd Street and N Hemlock Street/1st Street.
- The only queue length that exceeds 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, though the intersection spacing between Fir Street and Beech Street is less than 50 feet.
- Based on conversations with the public and stakeholders, some intersections, particularly in downtown, are very congested during peak travel periods (some summer weekends, for example). Queues on some roadway segments may be longer than modeled during these conditions as well; public feedback indicated that vehicle queues can be extensive on Warren Way and on Fir Street, sometimes extending to US 101. These conditions did not occur under modeled scenarios.

Parking

Inventory

- Parking needs are especially high in and near the three commercial areas: downtown, midtown, and Tolovana Park.
- The majority of all on-street parking allows unlimited time stays (94%).
- On-street informational signage is inconsistent and, at times, confusing and/or lacking a clear sense of rules of use (e.g., legal parking stalls, hours of enforcement, etc.). Additionally, on-street markings and striping largely do not exist and could improve the efficiency of the system and the overall user experience.
- Teal curb paint designating 10-minute stalls and/or loading zones is unique to Cannon Beach and may be more confusing than traditional yellow paint for loading zone stalls. Teal paint is not a recognized color for traffic control according to the Manual on Uniform Traffic Control Devices (MUTCD).

Utilization

- Peak-hour parking occupancy is approximately 70% on a typical day.
- While the entire parking system is not constrained (over 85%), on-street parking is constrained in some places during high demand periods. In downtown, on-street parking is most constrained along Hemlock and Spruce north of 2nd Street. In midtown, on-street parking is most constrained between Gower Rd and Dawes Ave.
- The overall use of off-street parking stalls is low to moderate in both downtown and midtown. In both areas, there are a few off-street facilities that show constraints.
- While on-street parking constraints are evident on specific block faces within downtown and midtown, parking is generally available within a short walking or driving distance from these popular areas.
- Understandably, these nearby parking locations are not as convenient, but they are available. Basic parking management strategies can help redirect demand into areas with surplus parking, while freeing up more convenient, centrally located stalls for higher turnover users.
- Parking constraints could be also addressed by increasing access to existing off-street parking stalls. However, most off-street parking stalls are privately owned and managed, so future potential use of these stalls would require coordination with property owners.

Pedestrian System

- Most of the streets in Cannon Beach are low traffic without sidewalks or other dedicated facilities for walking. Sidewalks are limited to the City's commercial areas.
- All curb ramps on Sunset Boulevard west of US 101 are rated poor and most are not ADA compliant. Conditions vary for other ramps in the City and ramps may not comply with current ADA guidelines.¹ All ramps should be inspected and those that are non-compliant or in poor condition should be improved.
- There are no pedestrian crossing buttons at existing crossings because there are no signalized intersections or crossings.
- Streets with high traffic volumes would benefit from sidewalks or other improvements that separate pedestrians from traffic and provide ADA-compliant access.
- A lack of sidewalks in busy areas, such as near Tolovana Beach State Recreation Site, limits pedestrian mobility. This is particularly pronounced for people using mobility devices who may not feel comfortable using a shoulder next to traffic.
- Sidewalks are inconsistent from the north end of Hemlock Street to the edge of the commercial area at Fir Street and Beaver Street. They are narrow in some places and nonexistent in others.
- Hemlock Street lacks sidewalks outside of commercial areas, requiring people to walk on the shoulder or use an alternative route. Alternative routes do not always exist, like at Haystack Hill, where Hemlock Street is the only through route and has narrow shoulders. The Cannon Beach Academy elementary school on Hemlock Street does not have sidewalks leading to it.
- No crossings have signals. Enhanced crossing treatments could be considered in areas with high volumes of tourist traffic.
- Streetlighting outside of commercial areas is relatively low and may have contributed to a crash on Hemlock Street. The narrow shoulders of Hemlock Street that are often used by people walking and biking warrant considering the value of additional pedestrian-scale street lighting. This will have to be balanced with the value of limiting light pollution.
- Walking and biking activity is high near the three commercial areas in Cannon Beach: downtown, midtown, and near Tolovana Park. Many people also walk and bike to the beach, either through neighborhoods or through parks like Whale Park or Tolovana. Cannon Beach's collection of regional, community, and local parks are also popular destinations for residents and visitors to walk and bike to.
- The one public school in the City, the Cannon Beach Academy, has a crosswalk near it but no other dedicated pedestrian facilities.

Bicycling System

- There is no designated network for bicycling or master plan for bicycling in the City. A bike master plan is a policy objective in the Comprehensive Plan.
- Hemlock Street is the main route for traveling through town and the designated route for the Oregon Coast Bike Route. Much of the route north of 1st Avenue lacks a shoulder or bike lane. Hemlock Street south of 1st Avenue has shoulders that vary in width and are often shared with people walking or parked cars. The northbound shoulder disappears completely at the Lighthouse Inn, just north of Harrison Street. The lack of a consistent bike facility may be an impediment for people who want to bike.
- US 101 does not meet ODOT standards for shoulder width. Shoulders could be widened to a minimum of 6 feet, or 4 feet minimum in areas of physical constraints, to meet standards.

¹ Americans with Disabilities Act (ADA) 2010 Design Standards Guidance: <https://www.ada.gov/regs2010/2010ADASTandards/2010ADASTandards.htm>

- There are few bike facilities north of 1st Street. Aside from two exceptions (a limited stretch of shoulders between 5th Street and Beaver Street and a two-block segment of a single 4-foot southbound bike lane on Fir Street – E 3rd Street) people biking have to share the travel lane with people driving.

Public Transportation

- Limited private transportation services operate in Cannon Beach. A variety of taxis serve the area and are primarily based in Seaside. Hotels may offer shuttles or car service to their guests. The Stephanie Inn, for example, has a car available to provide rides to locations in the city. Cannon Beach is outside the coverage areas for Uber and Lyft.
- Infrequent service and limited service hours may make transit an impractical option for those who would prefer to use it.

Freight

- Maintaining access to commercial areas and industrial areas will be important to consider while assessing potential transportation improvements.
- Delivery trucks require a place to park while delivering. There are currently few designated loading zones in commercial areas. Curb management and loading zones will need to be balanced with demand for parking.

Emergency Response

- Much of Cannon Beach is within the inundation zone, based on analyses by Oregon Department of Geology and Mineral Industries (DOGAMI).
- Consistent wayfinding for tsunami evacuation routes may be vital in case of a seismic event. It is unclear from this analysis if existing signage is adequate.
- Wayfinding and route familiarity are critical elements in tsunami evacuation success. City staff have indicated that getting people to safety in the first 20-minutes of an emergency is critical to public safety; the TSP should support a transportation system that supports the safe and efficient movement of community members in the case of an emergency.

Safety

- Between 2014 and 2018, 47 reported collisions occurred within the Cannon Beach UGB. Most crashes occurred along S Hemlock Street and US 101.
- Crashes in the Cannon Beach UGB are generally not severe. Between 2014 and 2018, no fatalities occurred in Cannon Beach. One crash led to serious injuries (2 percent) and six crashes led to minor injuries (13 percent). Conversely, 85 percent of crashes led to property-only damage or possible injuries.
- The three most common crash types include not yield right of way (10 crashes), driving too fast for conditions without exceeding posted speed (seven crashes), and making an improper turn (five crashes). Most crashes occurred during the day or dusk (77 percent) or with dry roadway conditions (77 percent). Alcohol was a factor in one crash and drug use was a factor in another crash.
- Between 2014 and 2018, one crash involved pedestrians. The crash occurred at the intersection of S Hemlock Street and Dawes Avenue and resulted in suspected minor injuries (Injury B) for both pedestrians. The only recorded factor was not yielding right of way. The crash occurred at night without streetlights, but with clear skies and dry roadway conditions.
- Between 2014 and 2018, one crash involved a bicyclist. The crash occurred at the intersection of S Hemlock Street and Adams Street and resulted in suspected minor injuries (Injury B) for the bicyclist. The

only recorded factor was not yielding right of way. The crash occurred during daylight hours with clear skies and dry roadway conditions.

- Between 2014 and 2018, 36 percent of all crashes within the UGB (17 total crashes) occurred at intersections and 19 percent of all crashes within the UGB (9 total crashes) occurred at study intersections.
- Between 2014 and 2018, crashes only occurred at six of the 15 study intersections. The intersection with the highest number of collisions was S Hemlock Street & Gower Avenue.

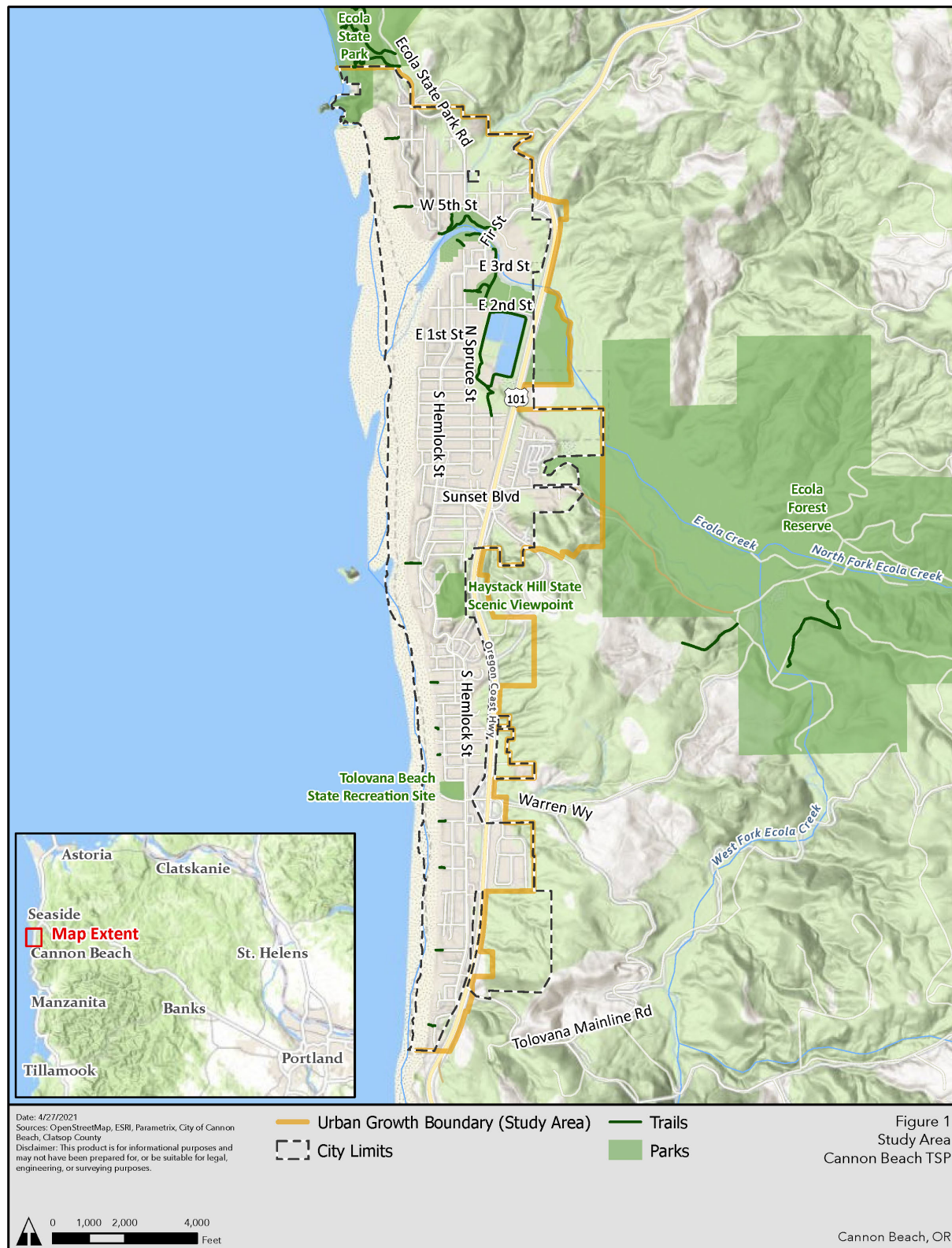
Study Area Description

Cannon Beach is a coastal community located in Clatsop County, approximately 10 miles south of Seaside, 40 miles north of Tillamook, and 80 miles west of Portland. The City has managed growth and development to maintain a compact footprint and a “village” atmosphere. Cannon Beach’s unique character and picturesque setting has made it a popular tourist destination. As of 2019, the City had a year-round population 1,491. However, the population swells with visitors during the summer tourist season.

The Cannon Beach Transportation System Plan (TSP) considers the land and transportation facilities within the Cannon Beach urban growth boundary (UGB) and city limits (Figure 1). The City is approximately 3.5 miles long, oriented north-south along the coast. Haystack Hill, a steep hill near the midpoint of the City, creates a topographical barrier for the transportation network.

Only two roads continue the length of the City: US 101 (State Highway 009) and Hemlock Street. Most of the City is located west of US 101, however there are two areas that extend to the east side of US 101 near W Chinook Avenue and Elk Creek Road. Hemlock Street is the transportation spine for Cannon Beach, providing access to the City’s commercial areas and most neighborhoods. Hemlock Street connects to US 101 at the south end of the City and indirectly connects to the recently completed interchange at the north end of the City. This forms an alternative route to US 101 route that runs parallel to it. Both US 101 and Hemlock Street experience relatively high traffic levels as the main north-south corridors through town. Outside of the main commercial areas, the City’s roadways experience relatively light traffic and offer more of a rural aesthetic. Few roads have sidewalks and many roads are gravel. Cannon Beach has no railroad and no airport, and despite being on the coast, also has no marinas, ports, or navigable waterways.

Figure 1. Study Area



Land Use and Population

Current Land Use

Land uses strongly influence the movement of people and goods. Where people live, go to school, work, and play define the community's transportation needs. As shown in Figure 2, Cannon Beach's land use is primarily a mix of residential, commercial, and park or natural spaces. Other land is used for institutions or public works, like the wastewater treatment plant and City offices. Land use in Cannon Beach is expected to remain consistent based on land use designations in the Comprehensive Plan. Cannon Beach's land use and zoning are respectively shown in Figure 2 and Figure 3 below.

Residential

Most of the City is zoned for residential development, and this residential area is primarily designated low or medium density, which allows up to 11 homes per acre. Low density areas tend to be further from US 101 accesses. Pockets of high density residential are distributed in the City and allow up to 15 units per acre. Notable locations include Breakers Point condominiums on the north edge of Ecola Creek and the multifamily housing on Elk Creek Road east of US 101. Two areas are zoned for manufactured homes, the RV Resort at Cannon Beach east of US 101 and the Sea Ranch RV Park on Ecola Creek. The City also has zoned areas for residential motels, which include hotels, motels, and high-density residential development. These residential motel areas tend to be along the coast or on Ecola Creek.

Commercial

Cannon Beach has three commercial nodes, one toward the north end, one in the middle of the city, and one toward the south end. Each commercial center has restaurants, retail, and places to stay. Each commercial center is also located near a US 101 interchange.

Another commercial area on Elk Creek Road east of US 101 is designated for use by non-retail businesses.

Parks and Natural Areas

Cannon Beach is immersed in and surrounded by parks and natural areas. Many people are drawn to the City for the beach and views of Haystack Rock. Tolovana State Park provides a large car parking area for visitors to access the beach with amenities like restrooms and a playground. Local City Parks, such as Whale Park and Les Shirley Park, are also access points to the Ecola Creek estuary and beach. Cannon Beach is home to John Yeon State Natural Site, Haystack Hill State Park, and other local City Parks, including the Cannon Beach Skate Park. Though Ecola State Park is outside of the City, the primary access is through Cannon Beach. Parks, natural areas, and other community destinations are shown in Figure 4 below.

Civic Resources

Cannon Beach has a variety of civic resources. The Cannon Beach Library and Chamber of Commerce are in the north commercial area. City Hall and the Cannon Beach History Center, meanwhile, are in the midtown commercial area.

Schools

Cannon Beach Academy is the only public school in the City. It is a public charter school serving students in kindergarten through fifth grade. Enrollment in June 2019 was 36 students.² Any student that resides in Oregon is eligible to attend, and students come from Nehalem, Cannon Beach, Seaside, Gearhart, Warrenton, and Astoria. Cannon Beach Academy is on Hemlock Street south of Warren Way. Cannon Beach Academy is located just off S Hemlock Street, potentially attracting walking trips to school.

Cannon Beach students are part of Seaside School District and are served by Seaside High and Middle Schools. Pacific Ridge Elementary School is available for children not attending Cannon Beach Academy. These three schools are all in Seaside, approximately 10 miles north. Traveling there requires using US 101. Seaside School District operates school buses to Cannon Beach.

Cannon Beach is also home to Ecola Bible College, a one-year Christian school, and Christian Culinary Academy. These are both at the north end of the City.

Economy

Tourism is the largest contributor toward the City's economy. Estimates from American Community Survey data show approximately 780 people were employed in Cannon Beach in 2018.³ The largest industry by far was Accommodation & Food Services, followed by Real Estate & Rental & Leasing and Retail Trade. Nearly 85% of Cannon Beach employees are estimated to work in one of these sectors.

Unlike other industries that require movements of goods, tourism requires movement of people to and within the City. Tourism is seasonal; transportation demands are highest from June through September. Movement of goods in Cannon Beach is primarily needed to support the services for tourists, like food for dining and items for retail.

² The Cannon Beach Academy Annual Report, 2019. https://drive.google.com/file/d/1gMnk2qoU_ywE4as9yjGnUuuWhSYQ-YZj/view

³ Cannon Beach, OR, Data USA. <https://datausa.io/profile/geo/cannon-beach-or/#economy>

Figure 2. Land Use

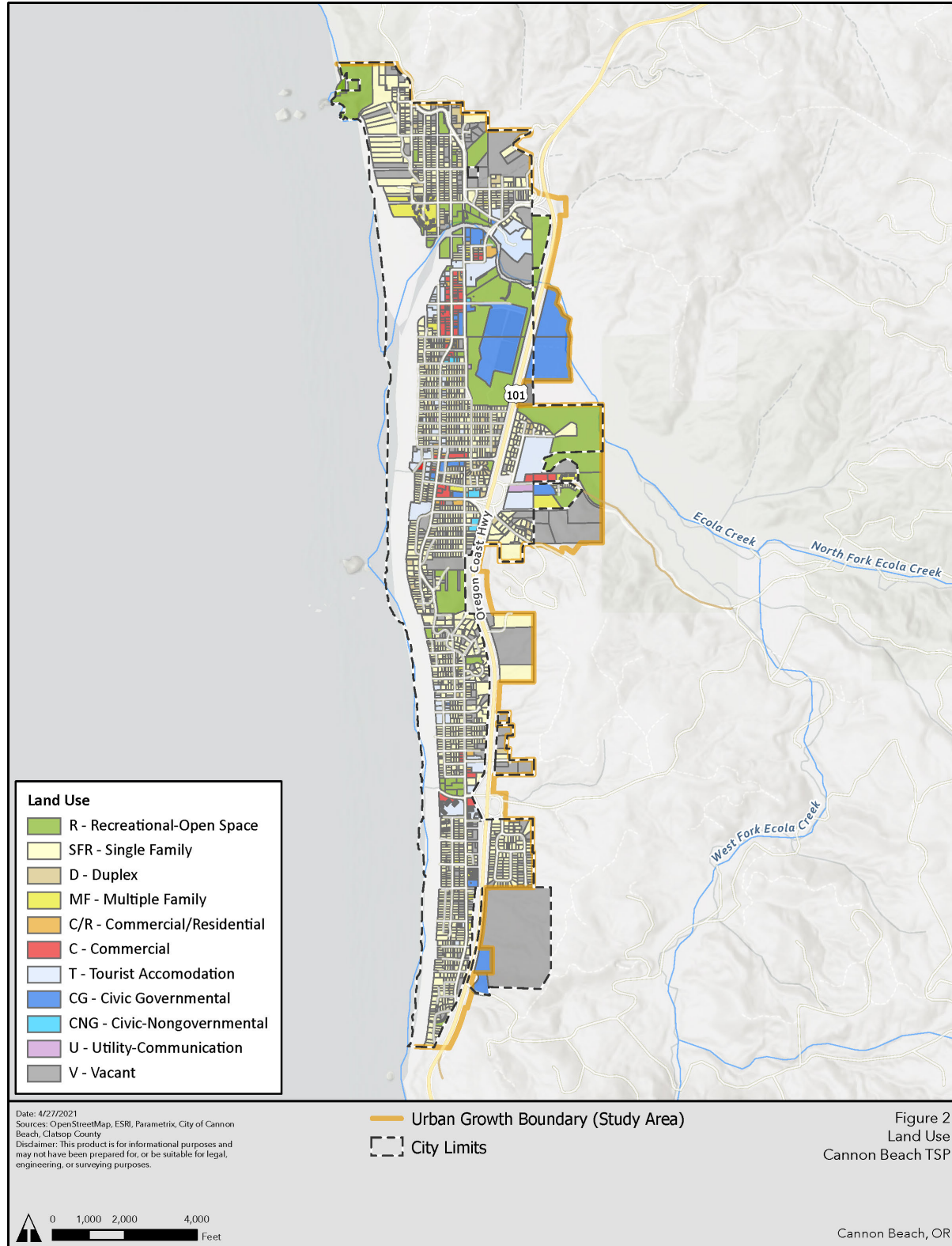


Figure 3. Zoning

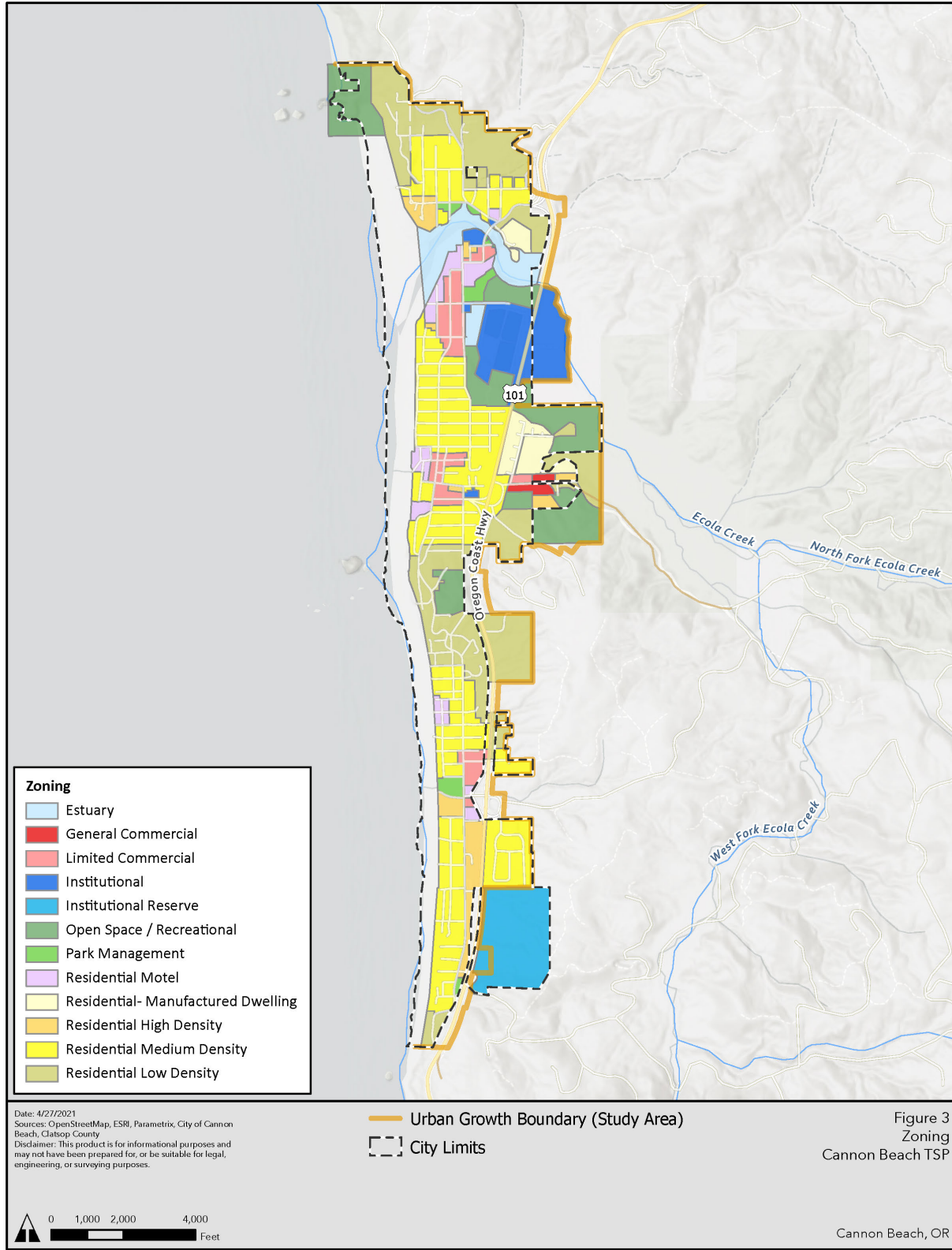
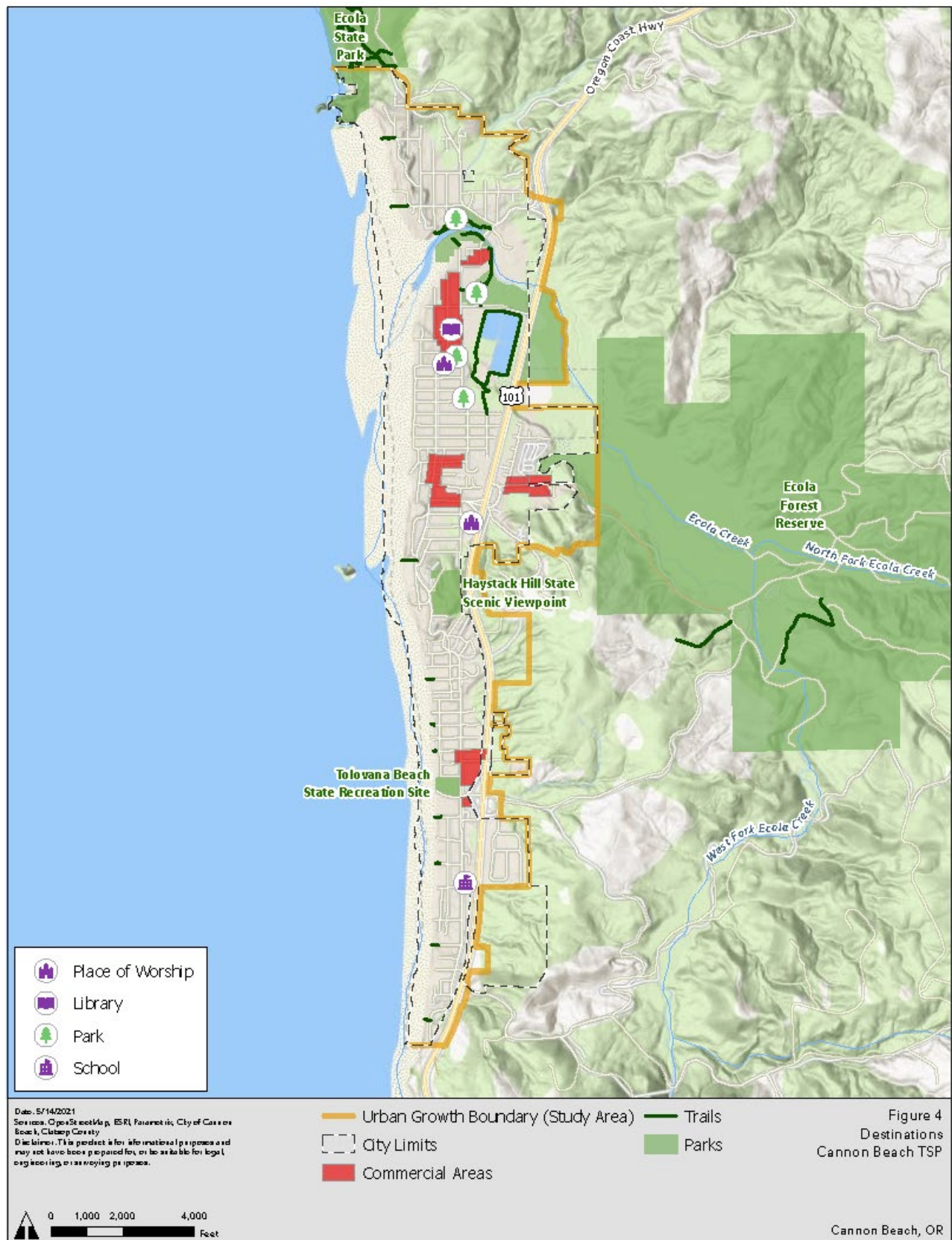


Figure 4. Destinations



Population

The year-round residential population of Cannon Beach is estimated at 1,491 as of 2019 (Table 1), although the City experiences large population increases in the Summer due to tourism. The demographics of people living in Cannon Beach are similar to those living in Clatsop County. They are more often white (79 percent in Cannon Beach) and older (21 percent are age 65 or over). A higher proportion of Cannon Beach residents are of multiple races (6 percent) than either the County or the State. The estimated population of Cannon Beach stands out for some other measures, as well. The portion of the population with low incomes in Cannon Beach (47 percent) is much higher than for the County (33 percent) or the State (31 percent).⁴ The portions of the population living with disabilities is notably higher in Cannon Beach (25 percent) than either the County or State.

When it comes to transportation, residents of Cannon Beach tend to have less access to motor vehicles (11 percent) and are less likely to drive to work than residents of the broader Clatsop County or State of Oregon. They also have shorter commute times, at 10 minutes versus over 20 minutes for the County and the State.

State and federal law require the TSP to consider disadvantaged communities in the planning process.⁵ The TSP must also address environmental justice (EJ) populations, defined by Executive Order 12828 as low-income and minority populations.⁶ The TSP also considers the needs of people with disabilities, youth populations (under 18 years old), and older adults (65+) in the development of future projects and programs. In particular, Cannon Beach has greater shares of people with lower incomes, people with disabilities, and older adults compared to Clatsop County and Oregon as a whole.

The largest minority groups in the City are those who identify as Hispanic or Latino (12 percent), Asian (2 percent), or two or more races (6 percent). Compared to the County and State, more households in Cannon Beach have limited English proficiency (LEP) (4 percent), which suggests making information available in Spanish would benefit many of the people in these households.

The City has a lower median household income (\$50,846) than either the County or the State and a higher number of people with low incomes (49 percent). A larger proportion of people in Cannon Beach live with a disability (25 percent) than either the County or the State.

Low-income and minority community members tend to have less access to motor vehicles and rely more on modes of

Approximately 1 out of every 4 people in Cannon Beach live with a disability.

This represents a larger proportion of people with disabilities than both Clatsop County (19%) and Oregon as a whole (14%). The TSP will explore opportunities to improve safety, comfort, and mobility for people with disabilities, including improvements that support ADA needs in the community.

⁴ The Census Bureau provides a large margin of error for the estimated poverty status of Cannon Beach residents. The full range, inclusive of the margins of error, of Cannon Beach residents with incomes below 200 percent of the poverty level is between 37 percent and 64 percent.

⁵ Title VI of the Civil Rights Act of 1964 states, “No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.”

⁶ Refers to Presidential Executive Order 12828: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994) and related applicable laws and regulations. <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>

transportation such as walking, biking, and public transportation. Disabled communities are also disproportionately impacted when facilities lack Americans with Disabilities Act (ADA) compliant facilities. The TSP will consider the needs of these communities to improve the transportation system for all the City's residents.

Table 1. Cannon Beach Community Characteristics

	Cannon Beach	Clatsop County	Oregon
Population	1,491	39,102	4,129,803
Age			
Youth (under 18)	15%	19%	21%
Older adults (65 years+)	21%	21%	17%
Income Characteristics			
Median household income	\$50,846	\$54,886	\$62,818
Low Income Population (Less than 2x Federal poverty level)	47%	32%	30%
Race and Ethnicity			
American Indian and Alaska Native alone	1 %	<1 %	1%
Asian alone	4 %	1 %	4 %
Black or African American alone	<1 %	1 %	2 %
Hispanic or Latino alone	12 %	9 %	13 %
Native Hawaiian and Other Pacific Islander alone	<1 %	<1 %	<1 %
White alone	79 %	86 %	76 %
Some other race alone	<1 %	<1 %	<1 %
Two or more races	6 %	3 %	4 %
Limited English-Speaking Households	4 %	1 %	2 %
Persons with Disabilities	25 %	19 %	14 %
Transportation Characteristics			
Households with Zero Vehicles Available	11 %	7 %	7 %
Average commute to work (minutes)	10	20	24
Drove alone	37 %	73 %	71 %
Carpool	16 %	11 %	10 %
Public transportation	1 %	1 %	5 %
Walked	31 %	8 %	4 %
Other Means	6 %	3 %	3 %
Worked at home	9 %	4 %	7 %

Source: American Community Survey (ACS) 2015 – 2019. ACS 5-Year Estimates Data Profiles: *Means of Transportation to Work; Economic Characteristics*. Title VI and EJ Communities

SYSTEM INVENTORY

Cannon Beach’s transportation system is primarily based on its street network. Aside from a few trails available for people to walk and bike on, people get around on the streets and sidewalks of the City.

The configuration of the City's streets has largely been defined by the City's geographic location and the early platting of the community. The Pacific Ocean to the west and steep forested uplands to the east create a narrow

linear strip of developable land. This developable land was platted into a grid style street pattern in the late nineteenth and early twentieth century. The result is a system of short residential blocks, generally measuring 300-450 feet in length and 200 feet in width or 200 feet in length and 800 feet in width. The residential blocks are connected to Hemlock Street, which provides a north-south arterial "spine" to the City's street system. In the late 1940s and early 1950, the Oregon Coast Highway (US 101) was relocated from Hemlock Street and a bypass was constructed to the east of the city. In the early 1970s, development began occurring on the east side of US 101. Residential street patterns in this area reflect the post-World War II suburban style, with curvilinear streets and cul-de-sacs.

The City's UGB contains over 20 miles of improved streets. The two main streets in the City are US 101 and Hemlock Street which have lengths of 3.4 miles and 3.0 miles respectively. There are over 11 miles of residential streets and over 2 miles of commercial streets. In addition, approximately 0.6 miles of Ecola State Park Road are located within the UGB.

Motor Vehicles

Functional Classification

Cannon Beach's roadways are classified in the transportation element of the Cannon Beach Comprehensive Plan. Classifications are shown in Figure 5 below. The system uses a range of five classifications: freeway, major arterial, minor arterial, collector and local. Classification is based on the extent the street provides for traffic movement or access to adjoining property. At one end of the classification is a local cul-de-sac street, which carries no through traffic. At the other end of the classification is a freeway, which carries no local access traffic. Cannon Beach has no freeways.

Local streets provide property access. Traffic movement on local streets is incidental and generally involves traveling to and from a collector or arterial street. Trip lengths on local streets are short, traffic volumes are low, and speeds are slow.

Most roads in Cannon Beach are local streets.

Collector streets collect and distribute traffic from arterial streets onto local streets, or directly to traffic destinations. Collector streets provide for both land access and movement within residential and commercial areas. Compared to arterial streets, collector streets have more frequent intersections, narrower right of way widths, more access points, and more on-street parking.

Though the Cannon Beach Comprehensive Plan does not recognize any collector streets in the City, ODOT does (see Page 20).

Arterial streets are intended to expedite the movement of traffic. Compared to other streets in the system, arterials carry high traffic volumes, have wide rights-of-way, and have fewer access points. Major arterials are intended to provide a high degree of mobility and serve longer trips. Therefore, they are designed to provide for high speeds and high levels of service. Since traffic movement, not access, is their principal function, access management is essential. Minor arterials interconnect residential, shopping, employment, and recreational activities at the community level. In comparison with major arterials, minor arterials accommodate trips of a shorter length and at a lower level of service.

US Highway 101 is the City's only major arterial, which is owned by ODOT. Hemlock Street and Sunset Boulevard are the City's only minor arterial streets. While these streets are owned by the City, intersecting roads with US

101 are generally owned by ODOT. For example, ODOT owns most or all of the east legs of the intersections at Hemlock and Warren Beach Road and Hemlock at Sunset Boulevard.

Design Standards

Cannon Beach uses ODOT road design standards. However, the City also has specific policies for roads to maintain a village character. When it comes to local streets, for example, the transportation element of the Comprehensive Plan describes a 1993 sidewalk policy that states “there will be no sidewalks in residential areas, i.e., on local streets” to maintain a “rustic streetscape.” Similarly, municipal code 12.34.040 states that streets shall be built “with a minimum of paved roadway width... to provide proper functioning of the street...” The code goes on to state that unpaved streets “are to remain gravel unless the city council determines after a public hearing that improvement of the roadway surface is in the public interest or slope conditions or other conditions or issues dictate improvement.” Through these policies, local streets have stayed narrow and many are still gravel. Note that these policies may not support ADA-compliant paths in the transportation network.

Cannon Beach has also adopted policies about US 101 in its Comprehensive Plan. The City states that it will work with ODOT to protect the scenic attributes of the highway, including “two travel lanes; a forested corridor that creates a sense of enclosure and continuity; the lack of adjacent commercial development; and a limited number of access points onto the highway.” It continues to say the City is “opposed to highway widening that would result in the creation of a passing lane or a four-lane cross section within the urban growth boundary.” The aesthetic characteristics of US 101 are important to the City.

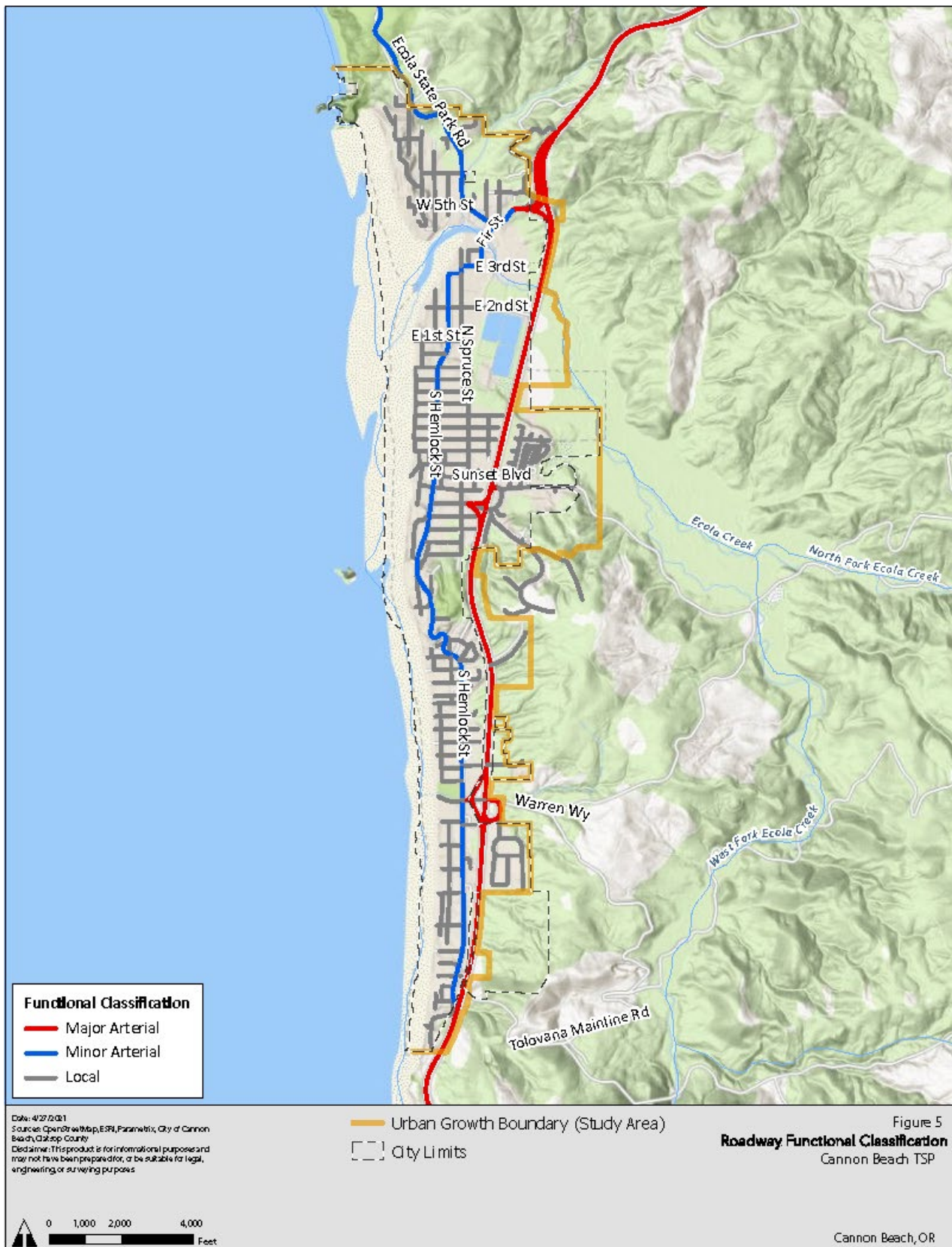
Table 2 summarizes the design standards based on the ODOT’s Highway Design Manual and Cannon Beach’s policies.

Table 2. Cross Section Standards

Functional Classification	Minimum Lane Width (feet)	Minimum Shoulder Width (feet)	Travel Lanes	On-Street Parking	Minimum Sidewalk Width	Bikeways
Arterial (Rural)	11 to 12	4 to 8	2	Varies	6 feet	Shoulder
Collector (Rural)	11 to 12	2 to 4	2	Varies	6 feet	Shoulder
Local Street	10	3	2	Permitted on both sides	No	No

ODOT Highway Design Manual, Tables 7-2 and 13-1, Section 13.4.3

Figure 5. Roadway Functional Classification



Federal Functional Classifications

Federal functional classifications, as reported by the State of Oregon's TransGIS database,⁷ differ from those in Cannon Beach's Comprehensive Plan (see Table 3). Roadways with a federal functional class of Collector or higher are eligible for potential federal funding.

Table 3. Local and Federal Functional Classifications

Road/Segment	Cannon Beach Comprehensive Plan Classification	Federal / State of Oregon Classification
US 101	Major Arterial	Principal Arterial
Hemlock Street	Minor Arterial	Major Collector
5th Street to Ecola State Park Road	Local	Minor Collector
Ecola State Park Road	Local	Minor Collector
Sunset Boulevard	Minor Arterial	Major Collector
Warren Way at US 101 Overcrossing	Local	Major Collector

Sources: Cannon Beach Comprehensive Plan Transportation Element, State of Oregon TransGIS

Traffic Control

The City contains no traffic signals. Traffic is controlled by stop signs at major street intersections.

Freight Generators and Network

Freight generators in Cannon Beach are related to retail and service provision for residents and tourists. The City's three commercial areas require deliveries of food and other goods and are located near the three interchanges with US 101. Freight mobility needs extend beyond service-oriented businesses. For example, a construction company and the Cannon Beach Business Park, with garage and storage spaces for industrial work, are located on the east side of US 101 near the Sunset Boulevard interchange.

US 101 is part of the National Network and is a State Reduction Review Route. Cannon Beach has four entrances from US 101. Three are served by grade separated interchanges, where the local road passes under US 101:

- North interchange: comes in at Fir Street.
- Mid interchange: comes in at Sunset Boulevard.
- South interchange: comes in at Warren Way.

A fourth entrance is at the southern edge of the City at the intersection of US 101 Hemlock Street. Hemlock Street is controlled with a stop sign. Northbound traffic on US 101 has a left turn lane to turn onto Hemlock Street.

Local roads that connect to US 101 are important for maintaining truck transportation. Most businesses are located near one of the US 101 interchanges. Hemlock Street provides access to local streets through much of the City.

⁷ Oregon Department of Transportation, ODOT TransGIS. <https://gis.odot.state.or.us/transGIS/>

Parking

Parking Inventory

High numbers of visitors combined with residents and workers who drive in Cannon Beach creates a high seasonal demand for parking. Parking needs are especially high in and near the three commercial areas: downtown, midtown, and Tolovana Park. A detailed analysis was conducted for two of these areas: downtown and midtown. Figure 6 and Figure 7 below provide an illustration of the downtown and midtown study areas, respectively.⁸ Based on the City's input, it is believed that the highest concentration of parking activity in Cannon Beach occurs within the selected boundaries.

There are 621 on-street and 1,643 off-street parking stalls within these two areas. The majority of all on-street parking allows unlimited time stays (94%). On-street informational signage is inconsistent and, at times, confusing and/or lacking a clear sense of rules of use (e.g., legal parking stalls, hours of enforcement, etc.). Additionally, on-street markings and striping largely do not exist and could improve the efficiency of the system and the overall user experience. Teal curb paint designating 10-minute stalls and/or Loading zones is unique to Cannon Beach and may be more confusing than traditional yellow paint for Loading zone stalls.⁹

Off-street parking is divided among 98 unique lots. Most lots and stalls are privately owned. Conditions at off-street sites vary but are generally well maintained. Quality of the public parking surfaces, lighting, striping, and on-site signage are clear for users. Additional right-of-way signage in the downtown area directing users to the off-street public lots may add to the user experience and lead to less queuing/circling for empty stalls.

⁸ Note that the chosen inventory boundaries are for data collection purposes only and do not necessarily reflect corresponding boundaries associated within current policy and/or code.

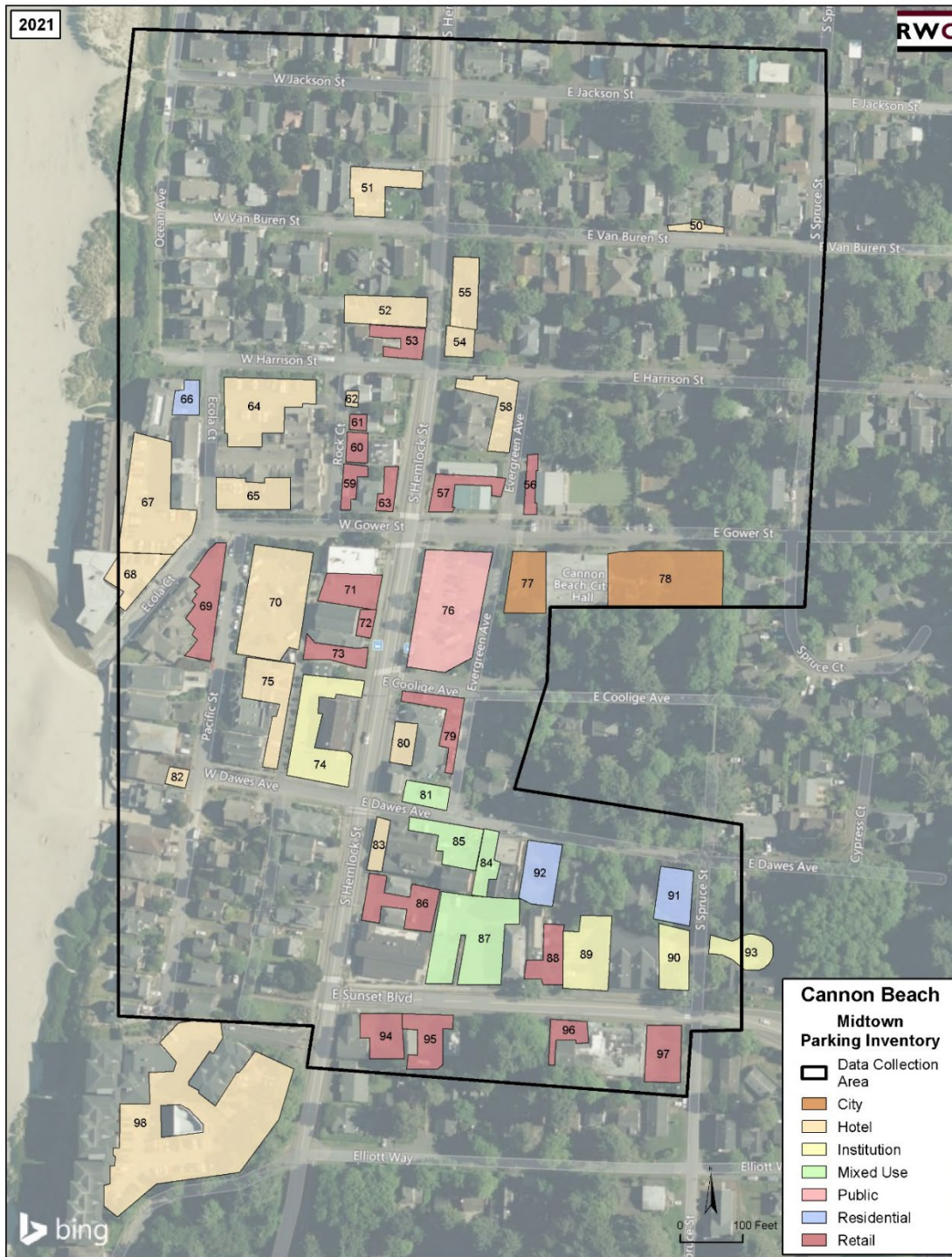
⁹ Note that teal isn't a recognized color by the Manual Uniform of Traffic Control Devices (MUTCD) and is not typically used to designate parking stalls or loading zones.

Figure 6. Downtown Parking Inventory



Note: Lot numbers are lot identifiers and do not indicate the number of available parking stalls.

Figure 7. Midtown Parking Inventory



Note: Lot numbers are lot identifiers and do not indicate the number of available parking stalls.

Bridges

Cannon Beach has five bridges within its urban growth boundary (Table 4). Four bridges are on US 101 and are owned and maintained by ODOT. The remaining bridge carries Fir Street over Ecola Creek. Bridges vary in condition from good to fair.

Table 4. Bridges in Cannon Beach

Bridge ID	Structure Name	Facility Carried	Feature Intersected	Year Built	Structure Type	Bridge Condition	Sufficiency Rating
18658	Hwy 9 over Hwy 9 Conn to Cannon Beach	US 101 (Hwy 9)	US 101 northbound on ramp	2003	Multiple Box Beam, Prestressed Concrete	Good	91.8
18892	Creek, Hwy 9 Conn at MP C28.45	US 101 (Hwy 9)	Creek	2003	Concrete Culvert	Good	97.9
01720	Ecola Creek (Ecola Creek), Hwy 9 Frtg Rd	Fir Street / Alternative US 101	Ecola Creek	1964	Prestressed Concrete Slab	Good	87.3
06713	Ecola Creek, Hwy 9	US 101 (Hwy 9)	Ecola Creek	1952	Continuous Concrete Slab	Fair	64.1
07405	Hwy 9 over Warren St (Cannon Beach)	US 101 (Hwy 9)	Warren Street	1952	Cast-in-Place Concrete	Fair	77.7

Data from <https://gis.odot.state.or.us/transGIS/>

Access

Access management balances access to developed land with ensuring movement of traffic in a safe and efficient manner. US 101 is an 'access-controlled' highway with limited accesses to adjacent land uses to preserve unhindered vehicular traffic flow. Therefore, highway accesses (usually in the form of interchange on/off ramps or intersections) are spaced further apart than on local street systems, which must provide higher access to adjacent land uses. Access spacing standards are governed by the roadway jurisdiction, functional classification, vehicle volume, and posted speed. Access spacing standards for roads under ODOT jurisdiction are outlined in Appendix C of the *Oregon Highway Plan*. The City of Cannon Beach does not have defined access spacing standards for local streets.

US 101 is classified as a statewide highway with a posted speed of 55 miles per hour (mph). The average annual daily traffic (AADT) ranges between 5,100 and 6,700 vehicles per day within the UGB. These characteristics determine the minimum interchange and access spacing distances. The minimum interchange spacing for rural areas is 3 miles, which is a spacing standard for the planning and design of new interchanges. The minimum access spacing for statewide highways in rural areas is 1,320 feet (see Page 72 for more details).

There is a total of 3 interchanges over 3.2 miles along US 101 within the Cannon Beach UGB, which exceeds ODOT standards for interchange spacing. There is also a total of 19 at-grade access points over 3.2 miles (16,895 feet) along US 101 within the Cannon Beach UGB, which exceeds the ODOT standards for access spacing.

Walking and Bicycling

Pedestrian and Bicycle Generators

The following is an inventory of locations that tend to attract more people walking, using mobility devices, or biking.

Commercial Areas

The City has policies included in its Comprehensive Plan and design review criteria to encourage pedestrian-oriented commercial areas. The City's three nodes of commercial development, downtown, midtown and near Tolovana Park, are located such that all areas of the City are within one mile of basic commercial services, like a grocery store. These allow people in the City's residential areas to access what they need by walking. All three commercial areas include a grocery store, places to eat and drink, and hotels, resorts or inns.

Beach Access

The City of Cannon Beach is oriented lengthwise along roughly 3.5 miles of beach. Accesses to the beach are through parks, such as Whale Park and Tolovana Beach State Recreation Area, and dispersed through the neighborhoods, with most east-west streets ending at a pedestrian path that leads to the beach.

Parks

Tolovana Beach State Recreation Site has one of the largest parking areas in the City, allowing visitors easy access to the beach as well as to the businesses and restaurants in Cannon Beach. City parks, such as the Cannon Beach Skate Park, provide amenities for local recreation.

Schools

Two of the City's schools are likely to generate pedestrian trips. The Cannon Beach Academy, toward the south end of town, has nearly 40 elementary students. Local families may be able to travel to school by walking. Ecola Bible College's students are mostly young adults and live in dorms or nearby in off campus housing.

Pedestrian Facilities

Pedestrian facilities include infrastructure to support safe and comfortable walking or use of a mobility device. Cannon Beach is compact and has been developed to support pedestrian travel. As a popular tourist destination, many visitors primarily get around the City by foot after they arrive.

Geospatial data for pedestrian facilities on the road network is limited to ODOT's database, which only includes US 101, ramps to US 101, and Ecola State Park Road.

Sidewalks

Most of the streets in Cannon Beach are low traffic without sidewalks or other dedicated facilities for walking. Sidewalks are limited to the City's commercial areas. Hemlock Street has sidewalks north of Sunset Boulevard. Spruce Street has a sidewalk on the east side of the street between 1st Street and 2nd Street, and a sidewalk on the west side of the street between 2nd Street and 3rd Street. The few east-west streets with sidewalks primarily serve commercial properties near downtown, including Gower Avenue, Sunset Boulevard, 1st Street, 2nd Street, and 3rd Street. One exception to this is Warren Way, where it connects Tolovana Beach State Recreation Site with ramps to US 101 and the residential neighborhood on Chinook Ave. There Warren Way has a sidewalk on its north side.

People are not permitted to ride bicycles, skateboards, or motorized scooters on sidewalks.¹⁰

Crossings

Marked pedestrian crossings are used on busier roads and in commercial areas. The commercial area at the north end of Cannon Beach, approximately from 1st Avenue to 5th Street, has marked crosswalks at major intersections along Spruce Street and Hemlock Street. The midtown commercial area, from Sunset Boulevard to Gower Avenue, also has marked crossings at most intersections with Hemlock Street. Sunset Boulevard has crosswalks as it continues east to Reservoir Road. Warren Beach Road, which connects Tolovana State Recreation Area to US 101, has crosswalks at the intersection with Hemlock Street and at the ramps on the north side of the street. (Sidewalks are only on the north side of Warren Beach Road.) Hemlock Street also has marked crossings at Delta Street and near the Cannon Beach Academy.

Two styles of striping are used: standard style crosswalks, with a pair of parallel white stripes, and ‘continental’ style crosswalks, with hashed white zebra stripes. Although many communities use both styles of crosswalk markings, continental style crosswalks are considered to have higher visibility due to thick lines parallel to traffic flow that allow drivers to see the crosswalk from further away.¹¹ Photograph 1 shows continental crosswalk in the foreground and a standard crosswalk to the left. Condition of the crosswalk markings varies by location. Newer crosswalks are striped continental style and appear in better condition.

Photograph 1. Marked crossing of E 3rd Street at N Antler Street. There is no sidewalk on south side of street.



¹⁰ Cannon Beach Municipal Code, Chapter 10.12 <http://www.qcode.us/codes/cannonbeach/>

¹¹ Federal Highway Administration (2018). Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations. https://safety.fhwa.dot.gov/ped_bike/step/docs/STEP_Guide_for_Improving_Ped_Safety_at_Unsig_Loc_3-2018_07_17-508compliant.pdf

Accessibility

In most locations, sidewalks at marked crossing locations have ramps and some have tactile warning strips. Curb ramps along Sunset Boulevard west of US 101 are inventoried in ODOT's TransGIS database. All curb ramps on Sunset Boulevard west of US 101 are rated poor and most are not ADA compliant. Visual inspection from Google Streetview imagery reveals that conditions vary for other ramps in the City. It is not clear from this review whether ramps comply with current ADA guidelines.¹²

There are no pedestrian crossing buttons because there are no signalized intersections or crossings in Cannon Beach. There are also no enhanced pedestrian crossings in Cannon Beach, although they would be allowed per the current Cannon Beach Municipal Code.

Lighting

In locations where pedestrian demand is higher, adequate pedestrian-scale street lighting is considered an important element to ensuring safe and comfortable travel for pedestrians, bicyclists, and individuals who use mobility devices such as wheelchairs or canes. Pedestrian-scale lighting improves accessibility by illuminating sidewalks, crosswalks, curbs, curb ramps, and signs as well as barriers and potential hazards. Street lighting can also improve overall perceptions of safety through popular commercial areas.¹³

Streetlights are dispersed through most of the City. A review of Google Streetview imagery revealed that most streetlights are cobra-style downlights, and that there are higher densities of streetlights in commercial areas than in the rest of the City. Hemlock Street, for example, has streetlights at every intersection in the commercial area north of Sunset Boulevard. South of Sunset Boulevard, however, lights are spaced two to three blocks apart. Residential areas on the west side of US 101 appear to have lighting spaced similarly, every two to three blocks. The two neighborhoods on the east side of US 101 lack utility poles and streetlights.

The City has also adopted a "dark sky" ordinance limiting new streetlighting to downcast lights and requiring all new commercial lighting to be reviewed and approved by the City Development Review Board.

Standards for Pedestrian Facilities

As mentioned in Design Standards above, a 1993 City policy restricts sidewalks on residential streets. For other areas that permit sidewalks, the City references the pedestrian facility standards set by the 1995 Oregon Bicycle and Pedestrian Plan (OBPP). The OBPP has since been updated and the most recent version was adopted in 2016. Cannon Beach's transportation element has not been revised to reflect changes in the OBPP. The 2016 OBPP states that the appropriate facilities for pedestrians on arterial and major collectors are sidewalks on both sides of the street, unless there are physical limitations and use characteristics that render a sidewalk unsuitable on one side of the street. Current ODOT design standards set the minimum sidewalk width for arterials and collectors at 6 feet (Table 2) and must comply with the requirements of the ADA.

¹² Americans with Disabilities Act (ADA) 2010 Design Standards Guidance: <https://www.ada.gov/regs2010/2010ADASTandards/2010ADASTandards.htm>

¹³ Sacramento Transportation & Air Quality Collaborative (2005). Best Practices for Pedestrian Master Planning and Design. https://nacto.org/docs/usdg/best_practices_ped_master_planning_design_sacramento.pdf

Compare Existing Conditions with Standards

Based on adopted standards, Hemlock Street should have sidewalks for its full length. However, it has consistent sidewalks on both sides of the street only between 3rd Street and Sunset Boulevard. There is a sidewalk on one side of the street north of 3rd Street. Aside from single parcels that have been recently developed, there are no sidewalks south of Sunset Boulevard. Sidewalks appear to be narrower than 6 feet in some areas, particularly on the north side of the City.

ADA accessibility may be limited on existing sidewalks due to non-compliant ramps, slopes, or clearances. Accessibility may also be limited on streets lacking sidewalks, especially unpaved streets.

Pedestrian Level of Traffic Stress

An assessment of level of traffic stress (LTS) was conducted for walking and biking facilities within Cannon Beach based on the *ODOT Analysis Procedure Manual, Chapter 14*. The method considers the quality and comfort of routes between origins and destinations to determine a generalized four-tier LTS rating including excellent, good, fair, or poor. These ratings provide a general measure of actual and perceived safety and comfort for people walking or biking along a particular street segment, based on factors such as the presence and quality of facilities, speed limits, traffic volumes, barriers, and other measures. LTS is only evaluated for Hemlock Street and US-101.

The pedestrian LTS analysis was based on the factors listed below. These analysis factors were adapted to meet the local context of Cannon Beach and are based on available data.

Basic Factors

- Posted speed limit.
- Number/direction of travel lanes.
- Adjacent land uses. The primary land uses on Hemlock Street, residential and central business districts, are considered low stress.
- Street functional classification – used as a general proxy for traffic volume information (data limited).
- Illumination.

Modal Factors

- Presence of sidewalks on one or both sides of the street.
- Presence of physical buffers between sidewalks and roadways on one or both sides of the street.
- The apparent physical condition/state of repair of sidewalk facilities.
- The presence of marked pedestrian crossings, signage, and curb ramps.

Four Levels of Pedestrian LTS

LTS 1 – Excellent

Represents low traffic stress with a complete network. These segments are generally safe and comfortable to people of all ages and abilities, and adjacent land uses are conducive to walking. Traffic speeds are low (20 to 25 mph). Buffers separate walkways from roadways. Sidewalks are present on at least one side of the street. Marked crossings, signage, and curb ramps are usually present. These segments are generally low-volume residential segments with complete pedestrian facilities.

LTS 2 – Good

Represents low traffic stress but requires more attention and may not be suitable for all ages and abilities. Traffic speeds are slightly higher (25 to 30 mph), making crossings more stressful. Some sidewalk gaps may exist, and not all crossings are marked or feature signage and curb ramps. Adjacent land uses are conducive to walking. These segments are generally low-speed residential segments with some gaps in pedestrian facilities or low-speed commercial areas with complete pedestrian facilities.

LTS 3 – Fair

Represents moderate stress and is more suitable for adults that do not depend on mobility devices. Traffic speeds are moderate (30 to 35 mph) but fast enough to make some crossings dangerous. Substantial sidewalk gaps may exist, and marked crossings, signage, and curb ramps may be missing. Adjacent land uses are less conducive to walking. These segments are generally higher speed segments with some gaps in pedestrian facilities.

LTS 4 – Poor

Represents high stress for all users. Traffic speeds are moderate to high (30 to 45 mph), with segments that can include complex, wide and/or high traffic volumes, making most crossings dangerous. Sidewalks may be incomplete or completely absent. Marked crossings, signage, and curb ramps may be missing. Buffers are absent. These segments are generally on roadways with high traffic or that lack pedestrian facilities.

Findings

Figure 8 and Figure 9 display the results of the pedestrian LTS assessment. Conditions along Hemlock Street range from 2 (good) to 4 (poor). This range is largely dependent upon the presence of pedestrian facilities and the posted speed limit. North of Sunset Boulevard, Hemlock Street has sidewalks and crossings and the speed limit 25 mph or less. This gives it a rating of 2. (The rating would be a 1, excellent, in this segment 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. A small segment at Sunset Boulevard rated as a 3 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.

Pedestrian LTS along US-101 is 4 (poor) given high speeds, a lack of sidewalks and no crossings.

Figure 8. Pedestrian Level of Traffic Stress (page 1 of 2: north)

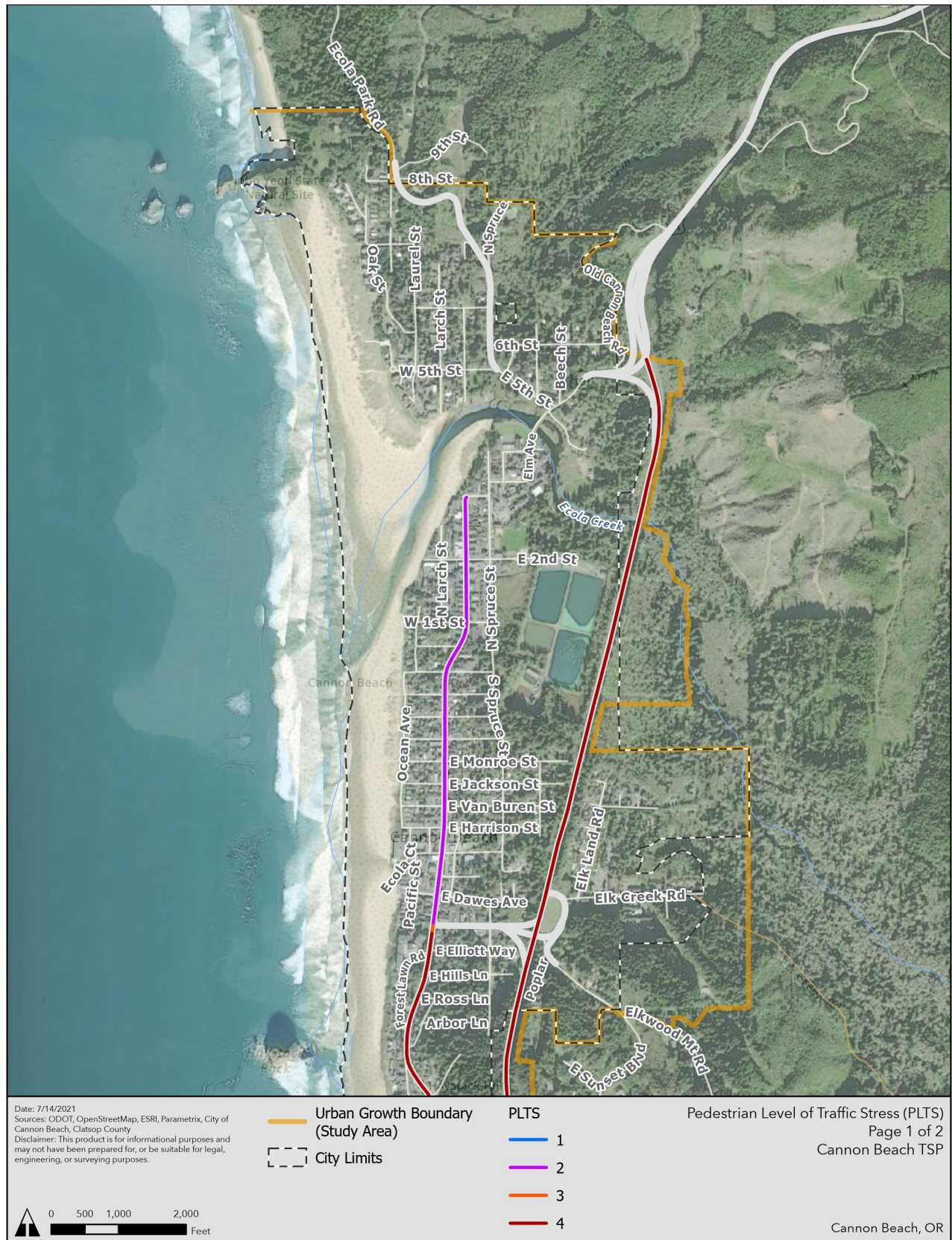


Figure 9. Pedestrian Level of Traffic Stress (page 2 of 2: south)



Biking Facilities

Inventory

Dedicated facilities for biking in Cannon Beach are located on arterials. US 101 has a paved shoulder ranging from 3 to 6 feet wide for the segment within the Cannon Beach UGB. Sunset Boulevard has 5-foot-wide shoulders between Hemlock Street and the US 101 ramps. Geospatial data for bike facilities is limited to ODOT's database, which only includes US 101, ramps to US 101, and Ecola State Park Road.

Hemlock Street is part of the Oregon Coast Bike Route and the route to reach Seaside. It has bike lanes or shoulders for much of its length, but the bike facilities vary:

- There are few bike facilities north of 1st Street. Aside from two exceptions (a limited stretch of shoulders between 5th Street and Beaver Street and a two-block segment of a single 4-foot southbound bike lane on Fir Street – E 3rd Street) people biking will have to share the travel lane with people driving.
- Hemlock Street through downtown has marked lanes between Gower Ave and Sunset Blvd that vary from 5 to 6 feet.
- Elsewhere, Hemlock has shoulders that are shared by people walking, people biking, and parked cars (Photograph 2). Shoulder widths vary and can disappear altogether.

Local streets have light traffic and are intended to be shared with people biking, driving, and walking.

Photograph 2. Sharing the road and shoulders on Hemlock Street



Current Standards for Bikeways

The transportation element of Cannon Beach's Comprehensive Plan describes the City's standards for bicycle facilities. Standards are based on the 1995 OBPP. Cannon Beach aims to provide bikeways and walkways on all arterial and major collector streets, except limited access freeways and expressways. In urban areas, bikeways can be one of three types:

- Shared roadways.
- Wide outside travel lanes.
- Bike lanes.

On a shared roadway, bicyclists and motorists share the same travel lane. Shared roadways are suitable in urban areas on streets with low speeds (25 mph or less) or low traffic volumes (3,000 AADT). Thus, a shared roadway is the appropriate bikeway design for local and minor collector streets.

Wide outside travel lanes can be used where bike lanes are warranted but cannot be provided due to physical constraints. To be effective, the wide outside travel lane must be at least 14 feet, but not greater than 16 feet.

Bike lanes are one-way facilities that carry bicycle traffic in the same direction as the adjacent motor-vehicle traffic. The preferred width of a bike lane is 6 feet. However, where physical constraints exist, narrower bike lanes are acceptable. On roadways with open shoulders the minimum bike lane width is 4 feet. On roadways with a curb, the minimum width is 5 feet. Bike lanes are the preferred means of providing for bicycles on arterial and major collector streets.

The transportation element also describes the importance of ongoing street maintenance for improving conditions for people to bike. Identified roadway improvements include providing properly designed drainage grates, improving sight distances at curves by removing vegetation, and fixing minor irregularities in the roadway. Important elements of an ongoing roadway maintenance program include routine sweeping and surface repairs and the maintenance of standardized signs, stripes and legends.

Compare Existing Conditions with Standards

US 101 through Cannon Beach is considered an arterial. The preferred minimum width for a bike lane is 6 feet, and a narrower lane is acceptable down to 4 feet where there are physical constraints. US 101 has paved shoulders that are 5 to 6 feet wide for most of the City. Shoulders are narrower than 5 feet at a few places, including a 0.1-mile segment north of Sunset Boulevard where shoulders are 3 to 4 feet wide and a 0.3-mile segment at S Hemlock Street where shoulders are 4 feet wide. Shoulders narrower than 6 feet do not meet the preferred width. Shoulders narrower than 4 feet do not meet the minimum width.

Hemlock Street through Cannon Beach has shoulders or bike lanes for most of its length. Three segments lack facilities that meet standards for a bikeway:

- The segment of Fir Street from the intersection of 5th Street and for approximately 500 feet north lacks a bicycle facility that meets standards.
- The segment from 3rd Street between Fir Street and Antler Street has a westbound bike lane but only a narrow (approximately 2-foot) shoulder in the eastbound direction. The eastbound direction lacks a bicycle facility that meets standards.
- The segment from the intersection of 3rd Street and Antler Street to the intersection of Hemlock Street and 1st Avenue lacks a bicycle facility that meets standards.

E 5th Street that leads to Ecola State Park Road is classified as a minor collector by ODOT. Applying current ODOT design standards for a minor collector would provide shoulders that are 2 to 4 feet wide. The current road has no shoulders, a curb on one side and a sharp edge on the other.

Local streets meet standards as low traffic shared roadways.

Bicycle Level of Traffic Stress Assessment

A bicycle LTS assessment was conducted for the Hemlock Street following the ODOT guidance described in Pedestrian Level of Traffic Stress section above. The bicycle LTS assessment builds on the framework used to assess pedestrian LTS and considers the same basic analysis factors. However, some modifications and assumptions were made to the modal factors:

Basic Factors

- Posted speed limit.
- Number/direction of travel lanes.
- Adjacent land uses. The primary land uses on Hemlock Street, residential and central business districts, are considered low stress.
- Street functional classification – used as a general proxy for traffic volume information (data limited).
- Illumination.

Modal Factors

- Presence and type of bike facility (separated, standard bike lanes, or no bike facility / mixed traffic).
- Pavement condition.
- Potential conflict points, like driveways and right turn lanes.

Four Levels of Bicycle LTS

The ODOT guidance for evaluating bicycle level of stress describes the four levels of bicycle traffic stress as follows:

LTS 1 – Excellent

Represents little traffic stress and requires less attention, so is suitable for all cyclists. This includes children that are trained to safely cross intersections (around 10 yrs. old/5th grade) alone and supervising riding parents of younger children. Generally, the age of 10 is the earliest age that children can adequately understand traffic and make safe decisions which is also the reason that many youth bike safety programs target this age level. Traffic speeds are low and there is no more than one lane in each direction. Intersections are easily crossed by children and adults. Typical locations include residential local streets and separated bike paths/cycle tracks.

LTS 2 – Good

Represents little traffic stress but requires more attention than young children would be expected to deal with, so is suitable for teen and adult cyclists with adequate bike handling skills. Traffic speeds are slightly higher, but speed differentials are still low, and roadways can be up to three lanes wide for both directions. Intersections are not difficult to cross for most teenagers and adults. Typical locations include collector-level streets with bike lanes or a central business district.

LTS 3 – Fair

Represents moderate stress and is suitable for most observant adult cyclists. Traffic speeds are moderate but can be on roadways up to five lanes wide in both directions. Intersections are still perceived to be safe by most adults. Typical locations include low-speed arterials with bike lanes or moderate speed non-multilane roadways.

LTS 4 – Poor

Represents high stress and suitable for experienced and skilled cyclists. Traffic speeds are moderate to high and can be on roadways from two to over five lanes wide for both directions. Intersections can be complex, wide, and or high volume/speed that can be perceived as unsafe by adults and are difficult to cross. Typical locations include high-speed or multilane roadways with narrow or no bike lanes.

Bicycle LTS is shown in Figure 10 and Figure 11 below.

Findings

Bicycling level of traffic stress on Hemlock Street ranges from level 1 to level 3, with most of the street at level 2. The segment between Gower Street and Sunset Boulevard is the only level 1 area because it has marked bike lanes and a 25 mile per hour speed limit. A few areas are rated level 3 for different reasons. The segments north of 1st Street and between Harrison and Van Buren Streets lack shoulders or bike lanes. These can be busy areas with cars parking and opening their doors, the lack of a dedicated place to bike elevates the level of stress. The curves near Haystack Hill have narrow shoulders, challenging hills, and limited sight distances, and a 30 mile per hour posted speed limit, which combined to elevate the level of stress to a rating of 3. Similarly, the south curve to connect with US 101 has narrow shoulders and limited sight distance, while also connecting with fast moving traffic on the highway, giving it a rating of 3. The remaining segments of Hemlock Street are rated as 2 because they have 5 foot to 6-foot shoulders, relatively flat terrain, and relatively good visibility.

US-101 generally has an LTS score of 4 (poor) due to high speeds and lack of dedicated bicycle facilities. The facility does have marked shoulders that can be used by bicyclists, although shoulder widths vary along the corridor, are narrow, and offer no physical separation from fast-moving vehicle traffic.

Figure 10. Bicycle Level of Traffic Stress (page 1 of 2: north)

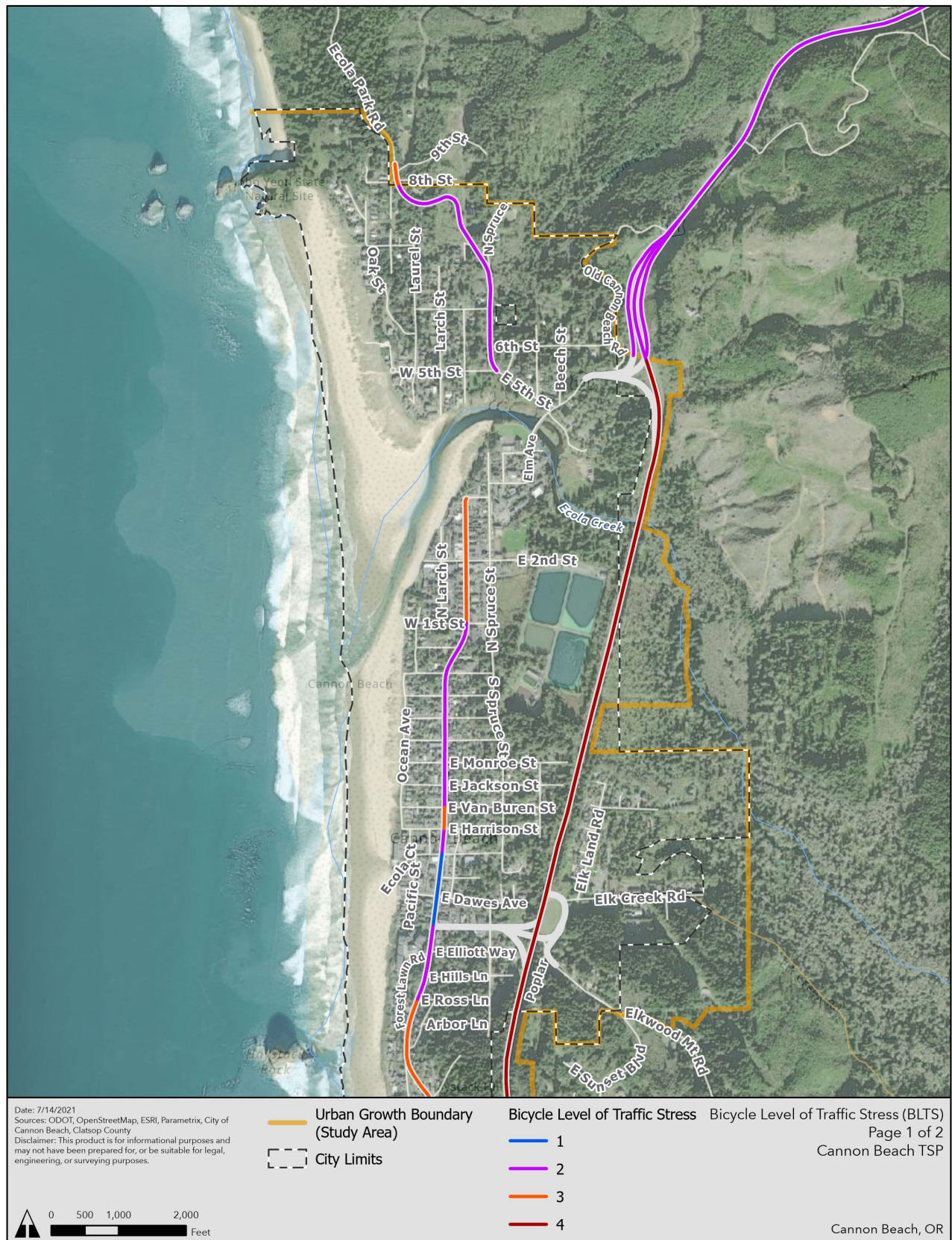
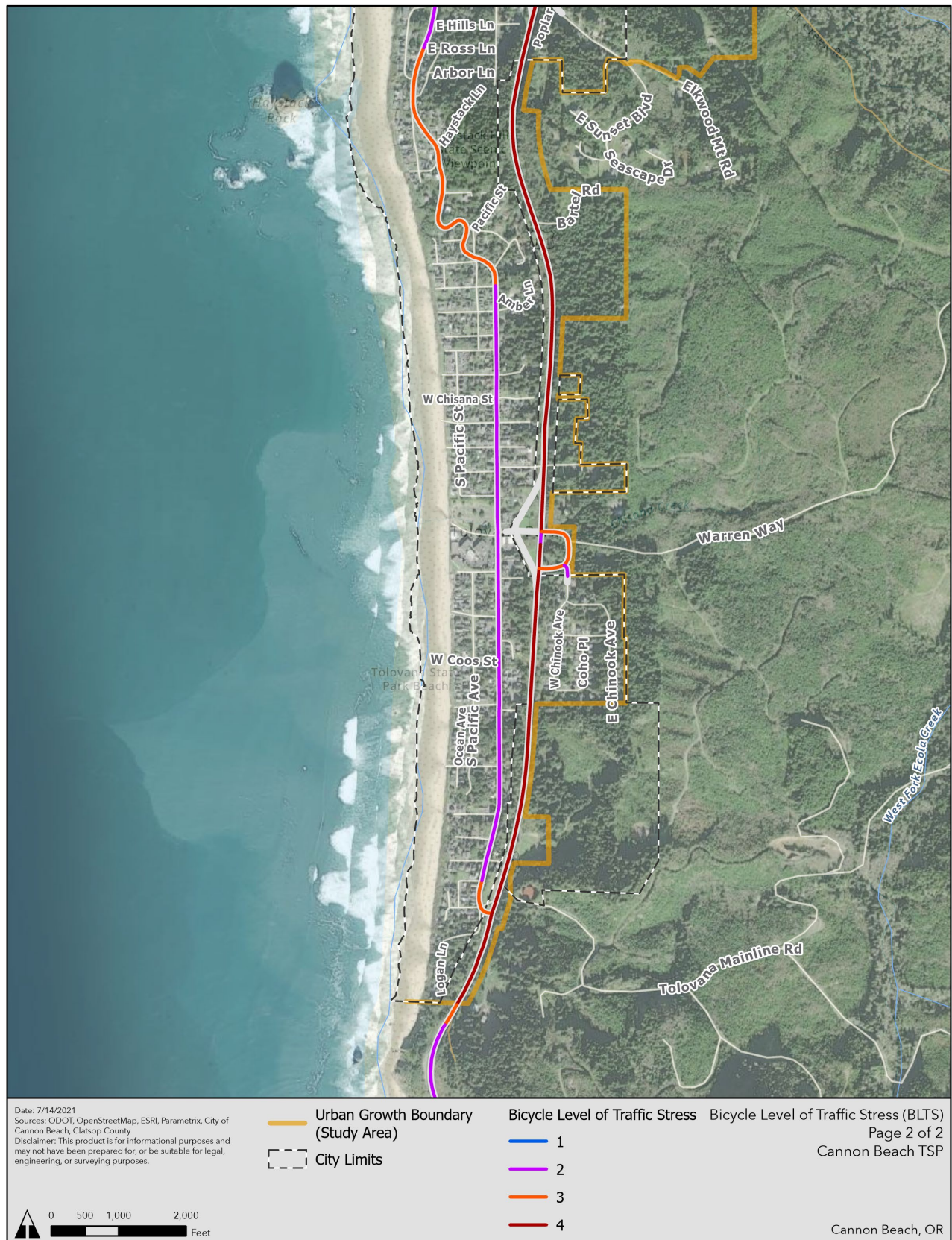


Figure 11. Bicycle Level of Traffic Stress (page 2 of 2: south)



Trails

Off-street trails perform two functions in the City's transportation network: access and connection. Trails provide access to natural areas, including Ecola Creek and the beach at various locations on the west edge of the City. A trail along the alignment of Spruce Street provides a connection between Dawes Avenue and Gower Avenue for people walking and biking. Figure 12 below, taken from the 2017 *Cannon Beach Parks and Trails Master Plan* displays the planned and existing trails in the City.

Figure 12. Planned and Existing Trails - Parks and Trails Master Plan (2017)



Current Standards for Trails

The transportation element of Cannon Beach's Comprehensive Plan uses trail standards set by the 1995 OBPP. The OBPP defines a multipurpose path as a bicycle improvement that is separate from city streets. Multipurpose paths are typically two-way facilities that are used by both pedestrians and bicyclists. The OBPP recommends that the primary focus of multipurpose paths be recreational use. For multipurpose paths to function effectively, they must connect into the City's street system in a safe and convenient manner.

Public Transportation

Transit options in Cannon Beach help reduce the need to drive within Cannon Beach and to reach nearby jobs and services in bigger cities like Seaside and Astoria. Cannon Beach is served by three intercity public transit providers, directly connecting to Seaside, Tillamook, Astoria, Portland, and cities in between. Two are part of the NW Connector alliance of transit agencies. The three transit providers come together at one shared bus stop on S Hemlock Street and Coolidge Avenue (Photograph 3). Cannon Beach's transit routes and stops are shown in Figure 13.

Transit service in Cannon Beach has low service frequencies overall (most busses come hourly). At this frequency, transit service has relatively low utility for many potential riders except for those with few options, though the level of service is comparable to other similar communities such as Tillamook, Seaside, or Rockaway. G

Sunset Empire Transportation District

Sunset Empire Transportation District (SETD) runs four bus routes with local service to Cannon Beach: the Pacific Connector, the #20 (Cannon Beach-Seaside, weekday), the #21 (Cannon Beach-Seaside weekend), and the seasonal #17 (Cannon Beach Shuttle). These four routes are the only transit options with multiple stops in Cannon Beach. Bus fares for all routes are one dollar.

Paratransit service is available to eligible riders for trips that start and end within $\frac{3}{4}$ mile of a fixed route in the district. Service is curb-to-curb and vehicles are wheelchair accessible.

- The Pacific Connector is a weekend service between Cannon Beach and Astoria. It makes five round trips on each Saturday and Sunday, beginning at 8:30 am and ending at 8:30 pm. A trip from the south end of Cannon Beach to Astoria is approximately 65 minutes.
- The #20 and #21 are similar routes, but the #20 operates on weekdays and the #21 operates on weekends. They also have different schedules. These routes connect with Seaside to the north and make multiple stops in both cities. There are nine stop locations in Cannon Beach from W Maher Street at the south end of Hemlock Street to Bruce's Candy Kitchen at the north end of Hemlock Street. The trip from the south end of Cannon Beach to the north end of Seaside takes approximately 30 minutes.
 - #20 (serves weekdays): travels between Cannon Beach and Seaside hourly between 6 am and 8 pm Monday through Friday.
 - #21 (serves weekends): makes 8 trips in each direction between Cannon Beach and Seaside between 9 am and 6:20 pm Saturday and Sunday (Cannon Beach is the southern terminus of the route).
- The #17, the Cannon Beach Shuttle, operates on weekdays from June through September. The #17 did not run in 2020 because of the pandemic. SETD intends to run it again in 2021.

Ridership of routes with local service in Cannon Beach (SETD's #20, #21, #17, and Pacific Connector) in 2019 was highest during the warmer months (Table 5), with a peak of 6,121 in August. Ridership for 2019 precedes the impacts to transit use that begin in March 2020 from the COVID pandemic.

Table 5. 2019 Transit Ridership of Local Cannon Beach Bus Routes

Route	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Pacific Connector	13,849	950	935	1258	1096	987	1463	1212	1281	1219	913	1311	1224
#20	30,368	2,287	1,958	2,346	2,617	2,850	2,876	3,398	3,345	2,365	2,409	2,064	1,853
#21	5,403	287	300	541	380	452	765	550	625	423	381	377	322
#17	2,748						570	817	870	491			
Total	52,368	3,524	3,193	4,145	4,093	4,289	5,674	5,977	6,121	4,498	3,703	3,752	3,399

Data provided by Sunset Empire Transportation District.

Tillamook County Transportation District (The Wave)

Tillamook County Transportation District, also known as The Wave, operates one bus route to Cannon Beach, the #3. It connects Cannon Beach with Tillamook and Manzanita. The route has one fixed stop in Cannon Beach at S Hemlock Street and Coolidge Avenue.

Tillamook County Transportation District allows deviations up to ¾ mile from the fixed route. All buses and vans are equipped with lifts and meet Americans with Disabilities Act (ADA) requirements.

- 3: Tillamook – Manzanita – Cannon Beach makes four trips in each direction between Cannon Beach and Tillamook between 9:30 am and 9:18 pm every day (Cannon Beach is the northern terminus of the route). A one-way trip between Tillamook and Cannon Beach is 4.50 dollars and approximately 90 minutes.

POINT

POINT, Oregon's intercity bus service, operates one fixed route bus line to Cannon Beach with one stop at S Hemlock Street and Coolidge Avenue. POINT buses are fully ADA accessible.

- NorthWest Route: connects to Portland, Astoria, and cities between. Makes one trip per day in each direction. Adult fares range from 3.50 to 18 dollars. A one-way trip from Cannon Beach to Astoria is 5 dollars and takes approximately 70 minutes. A one-way trip from Cannon Beach to Portland is 17 dollars and takes approximately 2 hours. Tickets must be purchased in advance through Amtrak, Greyhound, or participating retailers, including Theresa Family Market in Cannon Beach.¹⁴

¹⁴ <https://www.oregon-point.com/ticketing-info/?route=northwest>

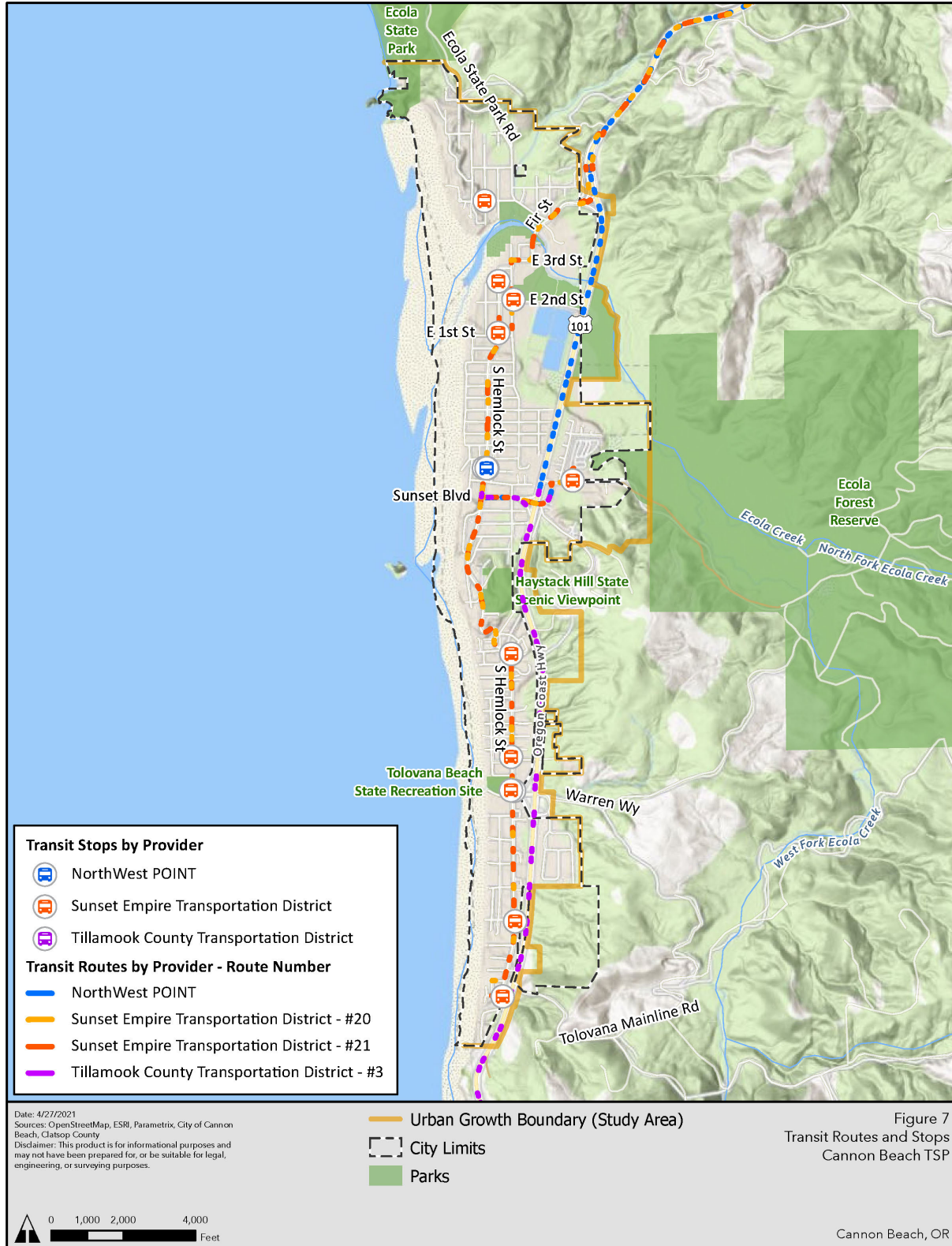
Photograph 3. Shared bus stop on S Hemlock Street at Coolidge Avenue



Private Services

Limited private transportation services operate in Cannon Beach. A variety of taxis serve the area and are primarily based in Seaside. Hotels may offer shuttles or car service to their guests. The Stephanie Inn, for example, has a car available to provide rides to locations in the city. Cannon Beach is outside the coverage areas for Uber and Lyft.

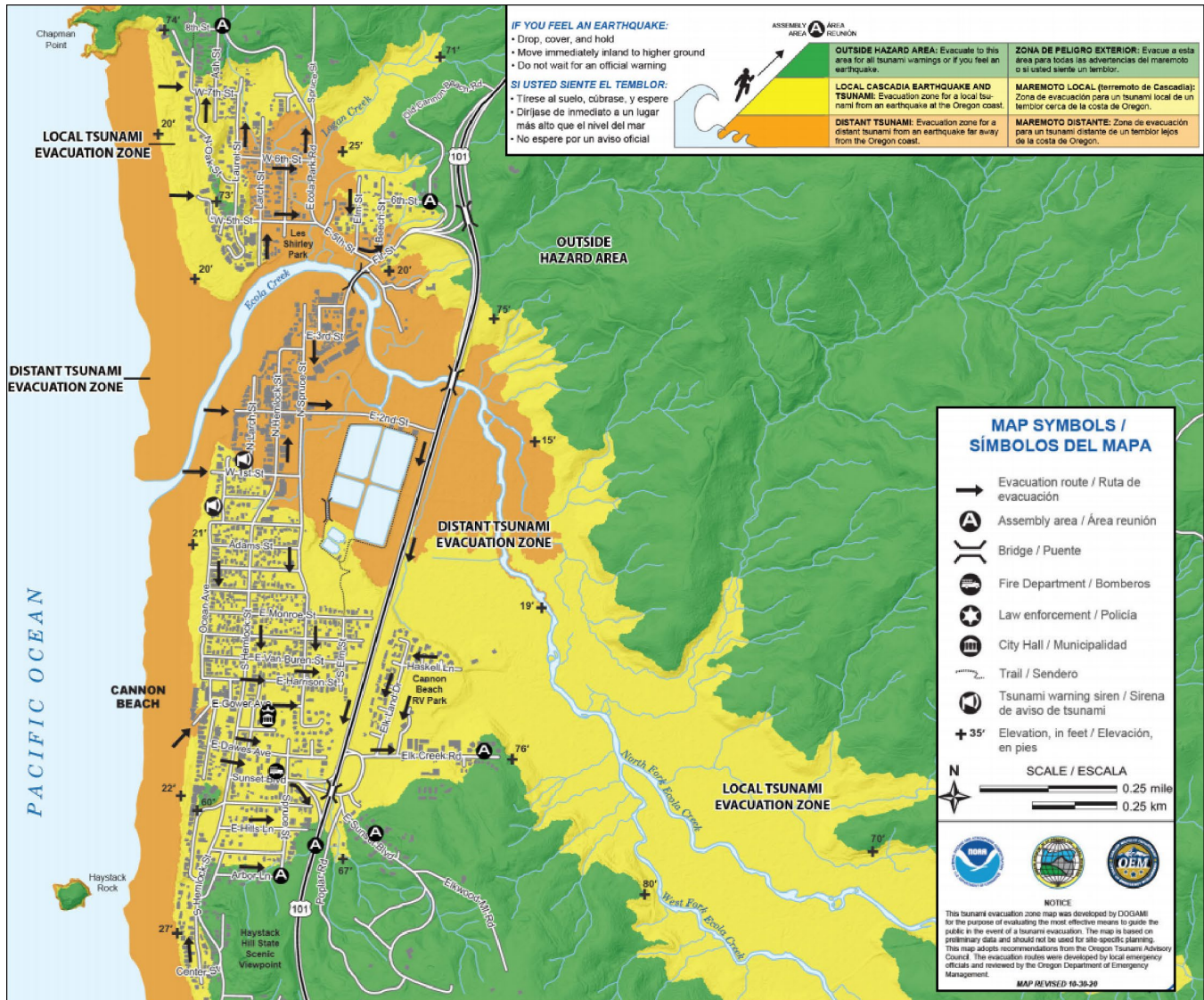
Figure 13. Transit Routes and Stops



Emergency Response and Evacuation

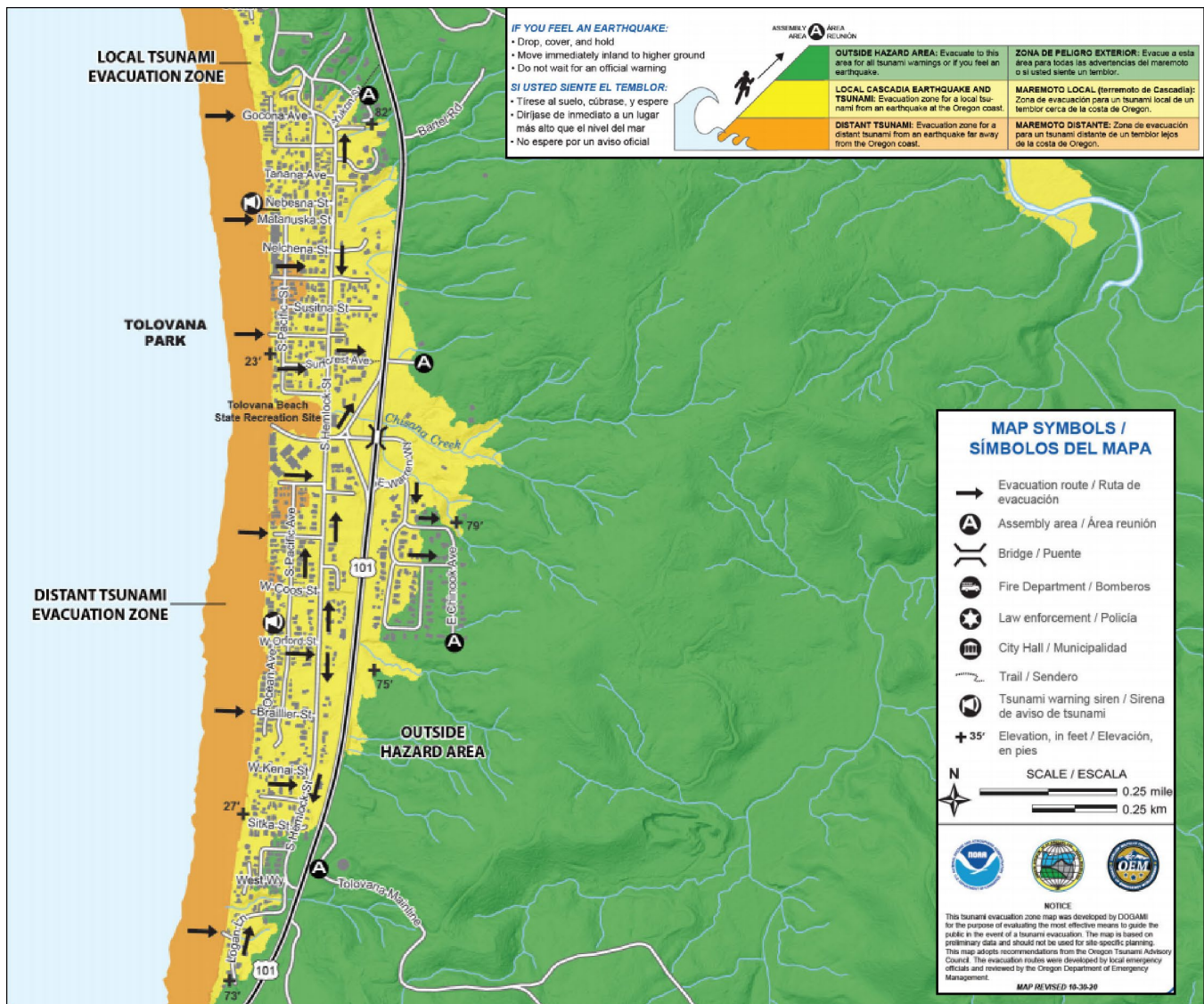
The City currently has an emergency response and evacuation system for assessing hazard areas and moving people to safety in the event of a potential tsunami. This system assesses tsunami hazard areas based on the presence of distant and local inundation zones, based on analyses by the Oregon Department of Geology and Mineral Industries (DOGAMI).¹⁵ The City's inundation zones are shown in Figure 14 and Figure 15 below.

Figure 14. Local and Distant Inundation Zones (page 1 of 2: north)



¹⁵ <https://www.oregongeology.org/pubs/tsubrochures/CannonBeachEvacBrochure-5-21-13onscreen.pdf>

Figure 15. Local and Distant Inundation Zones (page 2 of 2: south)



Emergency Response

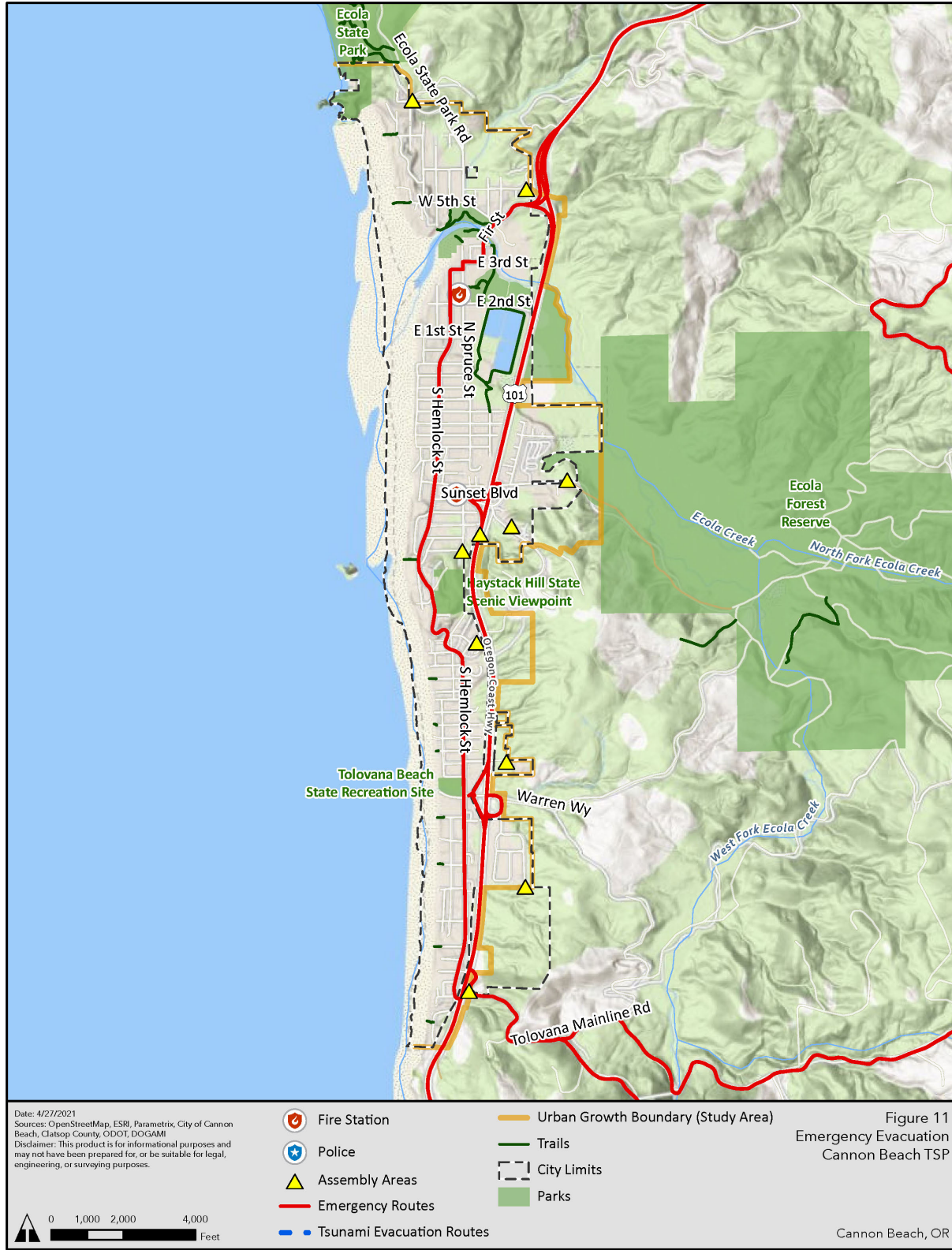
Emergency response routes allow emergency responders and vehicles to reach the location of an incident. Hemlock Street provides the main emergency response access through Cannon Beach. Most locations in the City are within two blocks of Hemlock Street. US 101 provides a parallel alternative. The fire station is located on Sunset Boulevard and the police department is two blocks north on Gower Avenue. Though Providence has a medical clinic in Cannon Beach, it is limited to family medicine. The nearest hospital is Providence Seaside approximately 12 miles north.

Tsunami Evacuation

Evacuation routes are intended to move many people quickly to higher ground, outside of the tsunami inundation zone. Much of Cannon Beach is within the inundation zone. Cannon Beach has designated evacuation routes and assembly areas for the City, as well as a series of maps showing the best way to reach high ground on foot for each neighborhood.¹⁶ Many of these routes have wayfinding signs, but it is unclear if the signage is consistent or adequate. Emergency response and evacuation routes are shown in Figure 16.

¹⁶ <https://www.ci.cannon-beach.or.us/emergencymgmt/page/tsunami-evacuation-routes-assembly-areas>

Figure 16. Emergency and Evacuation Routes



Other Inventories

Rail

No railroads operate in Cannon Beach.

Marine

Cannon Beach has no commercially navigable waterways.¹⁷ Marinas and ports operate in Warrenton and Astoria, approximately 20 miles north.

Aviation

No airports are in Cannon Beach. The nearest airport is Seaside Municipal, about 10 miles away, with a single paved runway for most light single and some twin-engine aircraft. The Warrenton-Astoria Regional Airport, operated by the Port of Astoria, is approximately 20 miles away and home to the United States Coast Guard Sector Columbia River. Portland International Airport is about 90 miles away and is the primary airport for commercial passenger travel.

Pipelines

Cannon Beach is served by a Northwest Natural Gas distribution pipeline. No gas transmission pipelines, or hazardous liquid transmission pipelines are located in Cannon Beach.¹⁸

EXISTING SYSTEM CONDITIONS ANALYSIS

This section assesses the existing conditions described above to better understand transportation system needs in Cannon Beach. The assessment considers usage of facilities, and how facilities compare to current design standards, and notable deficiencies.

Streets

Traffic Operations

Traffic Volumes

Existing conditions traffic operations were analyzed for the study intersections using 2020 30th highest annual hour of traffic (30 HV) conditions. 16-hour traffic counts were collected at the study intersections on Friday July 24, 2020 and included both vehicle and pedestrian volumes. The full traffic counts are provided in *Appendix A: Traffic Counts*.

¹⁷ <https://pvnpm.phmsa.dot.gov/PublicViewer/#>

¹⁸ <https://pvnpm.phmsa.dot.gov/PublicViewer/#>

Because the traffic counts may have been collected during a period where traffic volumes are lower than the 30 HV conditions, a seasonal adjustment factor was calculated as outlined in the ODOT Analysis Procedures Manual (APM)¹⁹. ODOT does not currently maintain any automatic traffic recorder (ATR) locations within or near the study area of Cannon Beach. Since there are no ATRs within or near the study area, the on-site ATR method for seasonal adjustment is not possible for this analysis. Instead, the ATR characteristic table was used to find one or more ATRs that are similar to the roadways in the study area to develop the 30 HV volumes within Cannon Beach.

Table 6. ATR Characteristics

ATR Number	ATR Name	2019 Seasonal Traffic Trend ¹	Area Type	# of Lanes	Weekly Traffic Trend	2019 AADT	2019 July ADT	2020 July ADT
06-004	Bandon	CO DEST	RURAL POPULATED	2	WEEKDAY	6900	9253	9169
08-005	Winchuck	CO DEST	SMALL URBAN FRINGE	2	WEEKEND	10000	13807	12725
29-001	Rockaway	CO DEST RT	RURAL POPULATED	2	WEEKEND	7200	10974	9717

¹CO DEST = Coastal Destination, CO DEST RT = Coastal Destination Route

Between 2015 and 2019, the average peak month for two of these ATRs was July and the third ATR had an average peak month of August. The seasonal adjustment factor was calculated by comparing the percent of AADT for the peak month to the percent of AADT for the count month (July). The seasonal adjustment for all three ATRs was 1.00, so no seasonal adjustment factor was applied to the July 2020 counts when developing the 2020 30 HV intersection volumes.

Considering the counts were collected for this analysis in 2020, the impacts of COVID-19 on typical traffic volumes were assessed. ODOT provided traffic volumes at the three ATRs for a Friday in July 2019 and a Friday in July 2020, as shown in Table 6. 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% divide by 93.3%, was applied to the July 2020 counts when developing the 2020 30 HV intersections volumes.

An overall system peak hour of 11:15am to 12:15pm was determined from the maximum hourly total intersection volumes. 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 17 and Figure 18.

¹⁹ Analysis Procedures Manual Version 2, Oregon Department of Transportation, March 2016.

Figure 17. Peak Hour Intersection Volumes (page 1 of 2: north)

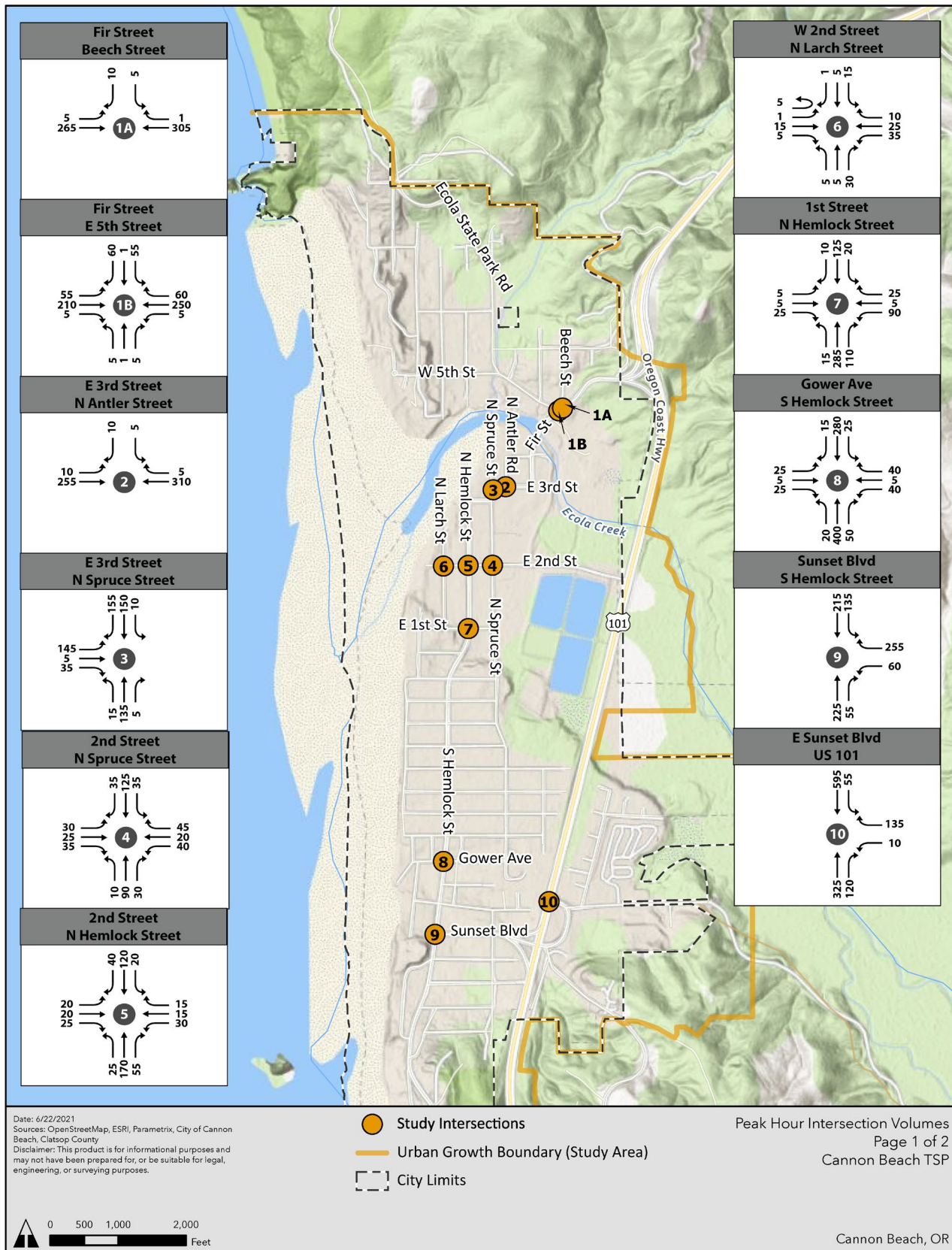
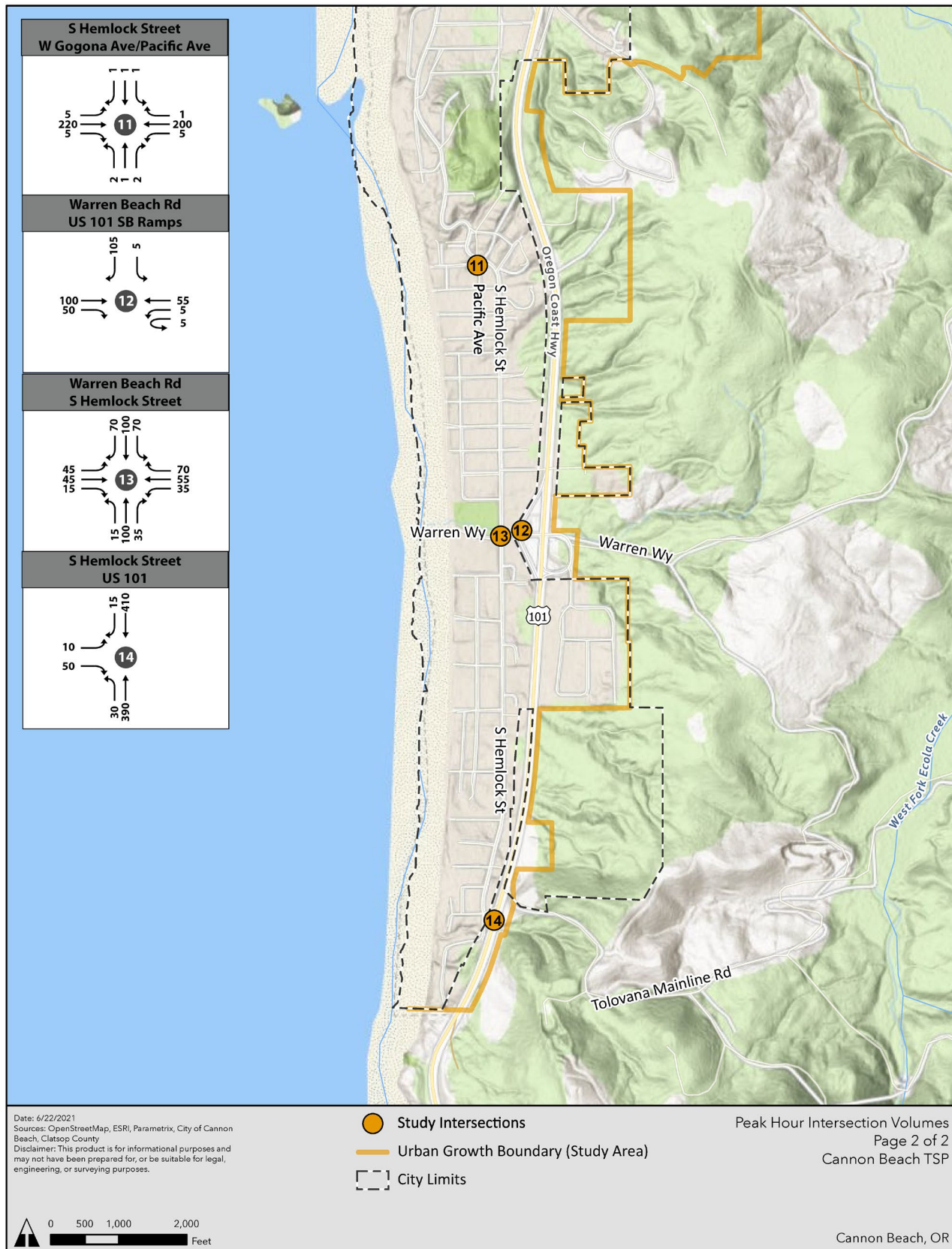


Figure 18. Peak Hour Intersection Volumes (page 2 of 2: south)



Operational Deficiencies

State highway mobility targets were developed for the 1999 Oregon Highway Plan (OHP)²⁰ 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 7. 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. 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 7. None of the study intersections are expected to operate with v/c ratios that exceed the mobility targets, though two intersections do operate at LOS F: N Hemlock Street/2nd Street and N Hemlock Street/1st Street.

The 95th percentile queue lengths were analyzed using SimTraffic. The only queue length that exceeds 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, though the intersection spacing between Fir Street and Beech Street is less than 50 feet.

Traffic reports are available in *Appendix B: Synchro and SimTraffic Reports*.

Table 7. Existing 2020 Traffic Operations – V/C Ratio, Delay, and LOS

#	Intersection	Existing Mobility Target	Mainline Operations			Side Street Operations			Exceeds Mobility Target?
			v/c ratio	Delay	LOS	v/c ratio	Delay	LOS	
1A	Beech Street & Fir Street	v/c < 0.95	0.18	8	A	0.03	12	B	No
1B	E 5 th Street & Fir Street	v/c < 0.95	0.42	11	B	0.18	9	A	No
2	N Antler Street & E 3 rd Street	v/c < 0.95	0.16	8	A	0.04	13	B	No
3	N Spruce Street & E 3 rd Street (southern intersection)	v/c < 0.95	0.43	11	B	0.29	10	B	No
4	N Spruce Street & 2 nd Street	v/c < 0.95	0.28	9	A	0.16	9	A	No
5	N Hemlock Street & 2 nd Street	v/c < 0.95	0.13	10	B	0.70	110	F	No
6	N Larch Street & W 2 nd Street	v/c < 0.95	0.06	9	A	0.10	14	B	No
7	N Hemlock Street & 1 st Street	v/c < 0.95	0.18	10	B	0.64	52	F	No
8	S Hemlock Street & Gower Avenue	v/c < 0.95	0.26	9	A	0.42	33	D	No
9	S Hemlock Street & Sunset Boulevard	v/c < 0.95	0.25	8	A	0.63	22	C	No
10	US 101 & E Sunset Boulevard	v/c < 0.80	0.40	8	A	0.24	13	B	No
11	Pacific Avenue/W Gogona Avenue & S Hemlock Street	v/c < 0.95	0.13	8	A	0.01	12	B	No
12	US 101 Southbound ramps & Warren Beach Road	v/c < 0.80	0.03	0	A	0.12	9	A	No
13	S Hemlock Street & Warren Beach Road	v/c < 0.95	0.11	8	A	0.34	18	C	No
14	S Hemlock Street & US 101	v/c < 0.80	0.26	8	A	0.12	13	B	No

It's important to note that the overall system peak hour for vehicles of 11:15am to 12:15pm included pedestrian volumes as part of the traffic model; therefore, the results shown in Table 7 above **also reflect traffic delay associated with high volumes of pedestrian crossings.**

Given that adjustment factors were included to account for seasonality and COVID-19, the results above are intended to indicate typical traffic conditions based on 30 HV conditions, but do not indicate seasonal “peak of the peak” conditions when tourism is at its highest. Therefore, mainline and side street operations are likely worse during the highest point of the visitor season in a typical non-COVID year. To account for this discrepancy, additional 16-hour weekday and weekend intersection counts will be collected at Hemlock and Sunset, and an additional volume only (directional) count on US 101 in 2021. These additional counts will provide proxy data to compare the typical conditions reported here with “peak of the peak” conditions. The TSP will explore solutions and strategies for addressing congestion and parking for both typical and peak of the peak conditions.

Geometric Deficiencies

The ODOT and Cannon Beach cross section standards are shown in Table 8. The existing lane widths were compared to these standards to identify potential geometric deficiencies, as summarized in Table 8.

Table 8. Comparison of Existing Lane Widths to Standards

Roadway	Extents	Jurisdiction	Functional Classification	Standard Lane Width (ft)	Existing Typical Lane Width (ft)	Meets Standards?
US 101	UGB Limits	ODOT	Arterial	11 to 12	12	Yes
Hemlock Street	3 rd Street to US 101	City	Arterial	11 to 12	11 to 12	Yes
Sunset Boulevard	S Hemlock Street to US 101	City	Arterial	11 to 12	12	Yes
2 nd Street	N Larch Street to N Spruce Street	City	Local	10	10 to 11	Yes
3 rd Street	N Hemlock Street to N Spruce Street	City	Local	10	11	Yes
Beech Street	north of Fir Street	City	Local	10	9	No
E 1 st Avenue	S Hemlock Street to N Spruce Street	City	Local	10	13	Yes
E 5 th Street	Ecola State Park Road to Fir Street	City	Local	10	11 to 12	Yes
Fir Street	E 3 rd Street to US 101 ramps	City	Local	10	11 to 12	Yes
Gower Avenue	Ecola Court to Spruce Court	City	Local	10	10 to 14	Yes
N Antler Street	north of E 3 rd Street	City	Local	10	12	Yes
N Larch Street	north of W 2 nd Street to W 1 st Street	City	Local	10	10	Yes
N Spruce Street	3 rd Street to E 1 st Ave	City	Local	10	11 to 13	Yes
Pacific Avenue	north and south of S Hemlock Street	City	Local	10	10 to 12 (1 lane)	Yes
W Gogona Avenue	west of S Hemlock Street	City	Local	10	11 (1 lane)	Yes
Warren Beach Road	S Hemlock Street to US 101 overcrossing	City	Local	10	11 to 12	Yes

Parking Utilization

Parking utilization analysis refers to counting occupied parking stalls for both on- and off-street parking spaces to determine where and when the available parking supply is constrained within the City. Parking utilization data was collected on Thursday, April 15th and Saturday, May 8th, 2021. Hourly on- and off-street parking counts were collected each hour between the hours of 9AM and 10PM. These dates and data collection hours were selected in consultation with City staff and the project team. The two dates allow for a comparison between a “typical” weekday (Thursday) and weekend (Saturday). The data collection methodology for measuring parking utilization was based on Oregon Transportation & Growth Management Program’s guide on parking: *Parking Made Easy – A guide to Managing Parking in Your Community*.²¹

²¹ Oregon Department of Transportation (2013). *Parking Made Easy: A Guide to Managing Parking in your Community*. Accessed May 1, 2021. <https://digital.osl.state.or.us/islandora/object/osl:10669>

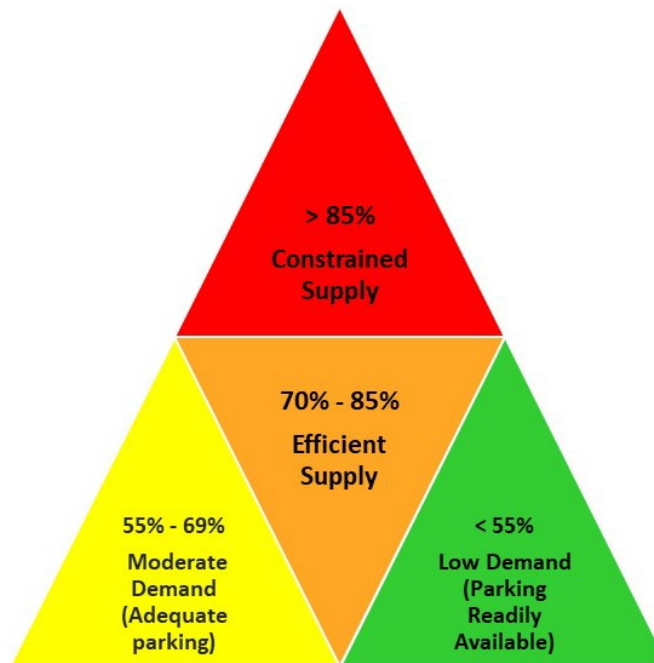
For the on-street system, parking utilization data was collected for all stalls within the study area, a 100 percent sample size. For the off-street system, occupied parking stalls were counted each hour of the survey day. In the downtown study area, occupancy data was collected on 34 of 49 unique off-street lots, representing 860 of 908 off-street parking stalls, a 95 percent sample size. In the midtown study area, occupancy data was collected on 38 of 49 unique sites, representing 586 of 735 off-street parking stalls, an 80 percent sample size.

The complete parking utilization analysis is provided in *Appendix C: Parking Utilization Study*

Measuring Performance

The “performance” of Cannon Beach’s parking system refers to the overall supply of parking on balance with a healthy level of parking use to support ground-level business growth. Figure 19 below displays the categories used to perform the parking utilization analysis and to evaluate the overall performance of the City’s parking system.

Figure 19. Parking Utilization - Performance Categories



As shown in Figure 19 above:

- **Utilization of 85 percent or more:** Indicates a constrained system where the available supply of parking is routinely occupied during the peak hour. In a constrained system, finding an available spot is difficult, especially for infrequent users such as customers and visitors. This can cause frustration and negatively affect perceptions of the downtown. Continued constraint can make it difficult to absorb and attract new growth, or to manage fluctuations in demand—for example, seasonal or event-based spikes.
- **Utilization of 70 to 85 percent:** Indicates an efficient system where parking shows active use but little constraint that would create difficulty for users. Efficient use supports vital ground-level businesses and business growth, is attractive to potential new users, and can respond to routine fluctuations.
- **Utilization of 55 to 69 percent:** Indicates a moderate parking system where there is adequate parking to meet demand during peak and off-peak hours.

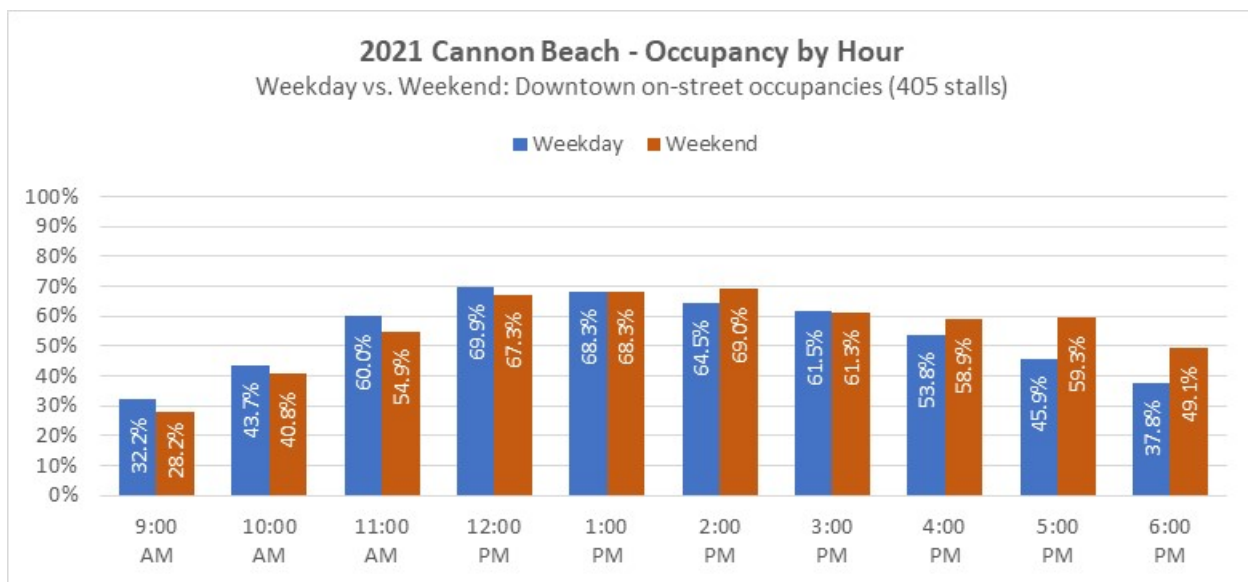
- **Utilization of 55 percent or less:** Indicates a low demand for parking. While parking is readily available, low parking occupancy may also indicate a volume of traffic inadequate to support an active and vital business environment.

Downtown Findings

On-Street Parking

Figure 20 below provides a comparative hour-by-hour look at the parking occupancy on both survey days. Generally, occupancies remain moderate throughout most of the operating day (11:00 AM to 6:00 PM). The weekday peak hour reaches 70% at noontime, whereas the weekend peak hour reaches 69 percent at 2:00 PM. While higher hourly occupancy rates are nearly split between weekday and weekend, weekend rates tend to start later (1:00 PM), but are more sustained into the evening hours (4:00 – 7:00 PM). Overall, while occupancies can be relatively high in the core area of downtown, ample available on-street parking is available on the periphery on both survey days.

Figure 20. 2021 Downtown On-Street Occupancies (Hourly Comparison)



Figures 21 and 22 below visually summarize parking occupancies by block face using a “heat map” of the study area. A heat map uses color to display degrees of occupancy as measured against an industry standard of 85%; when occupancy exceeds that level, the system is considered constrained. Block faces marked in red indicate areas of constraint. Green represents areas of underutilized parking, while yellow and orange represent the middle ranges of occupancy. This industry standard for measurement was described in Section 1.5 above. In the study area, there are a total of 38 block faces where on-street parking is allowed.

Weekday

- As the weekday heat map illustrates (Figure 21), 13 block faces are constrained at the peak hour, including many of the long blocks with the greatest parking capacity.
- Not surprisingly, several of those constrained block faces are clustered around Hemlock between 2nd and 3rd Streets. Even in this high-occupancy area parking is available within a block or two, if not on an adjacent block face.

- The clustering of high demand on these block faces may create the perception among users that parking is generally constrained downtown, particularly for those not inclined to walk a short distance.

Weekend

- On the weekend (Figure 22) there are fewer constrained block faces (just 10 as compared to 13 weekdays). However, the concentration of constrained block faces are similar to weekdays, clustered along Hemlock and Spruce north of 2nd Street.
- Interestingly, though fewer block faces are constrained on the weekend, the overall number of unique vehicles accessing the on-street system is 8 percent higher (67 more vehicles). This can be a function of the slightly higher weekend rate of turnover and/or how vehicles arrive and depart across a survey day.

Figure 21. Downtown on-street parking occupancies by block face – Weekday peak hour

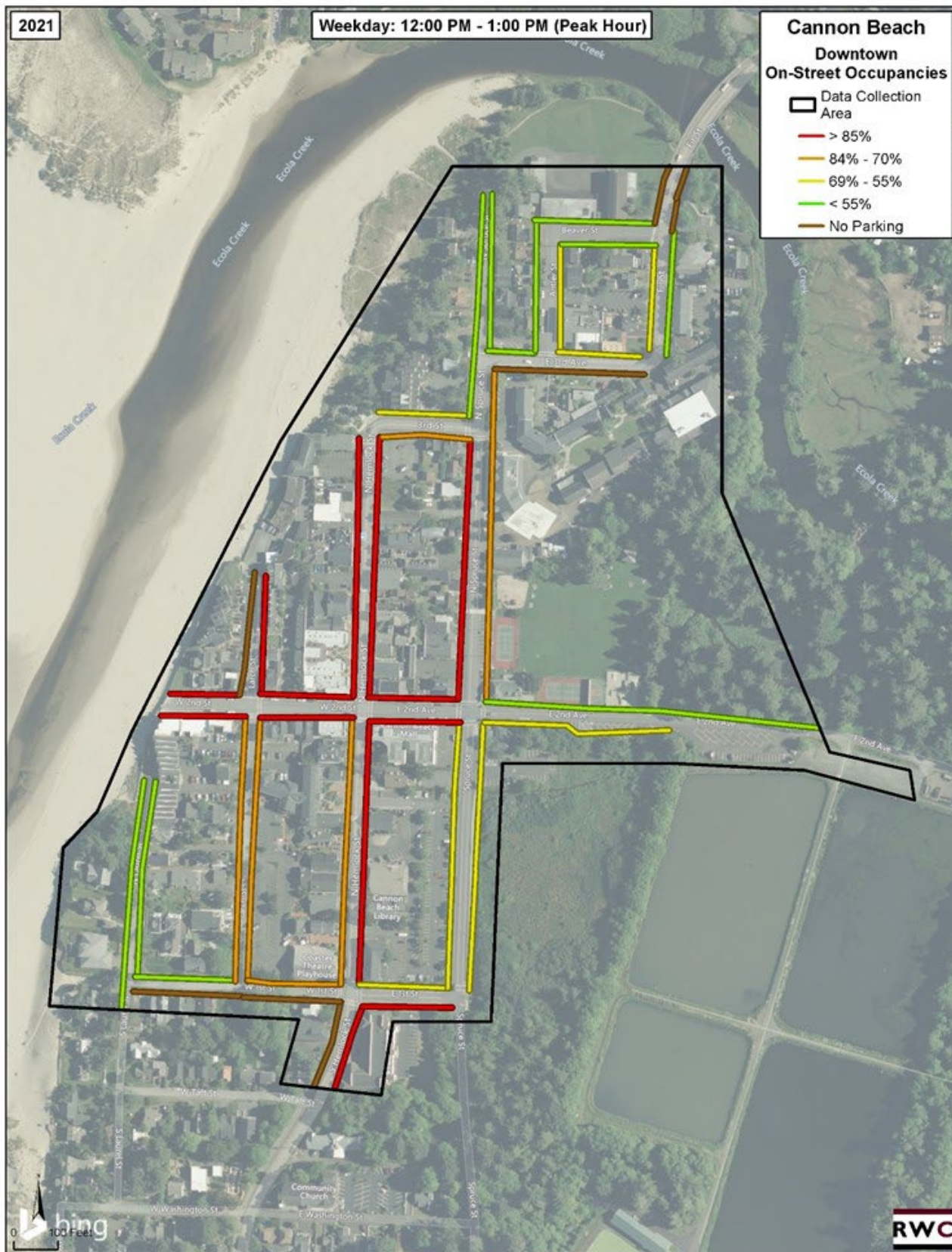
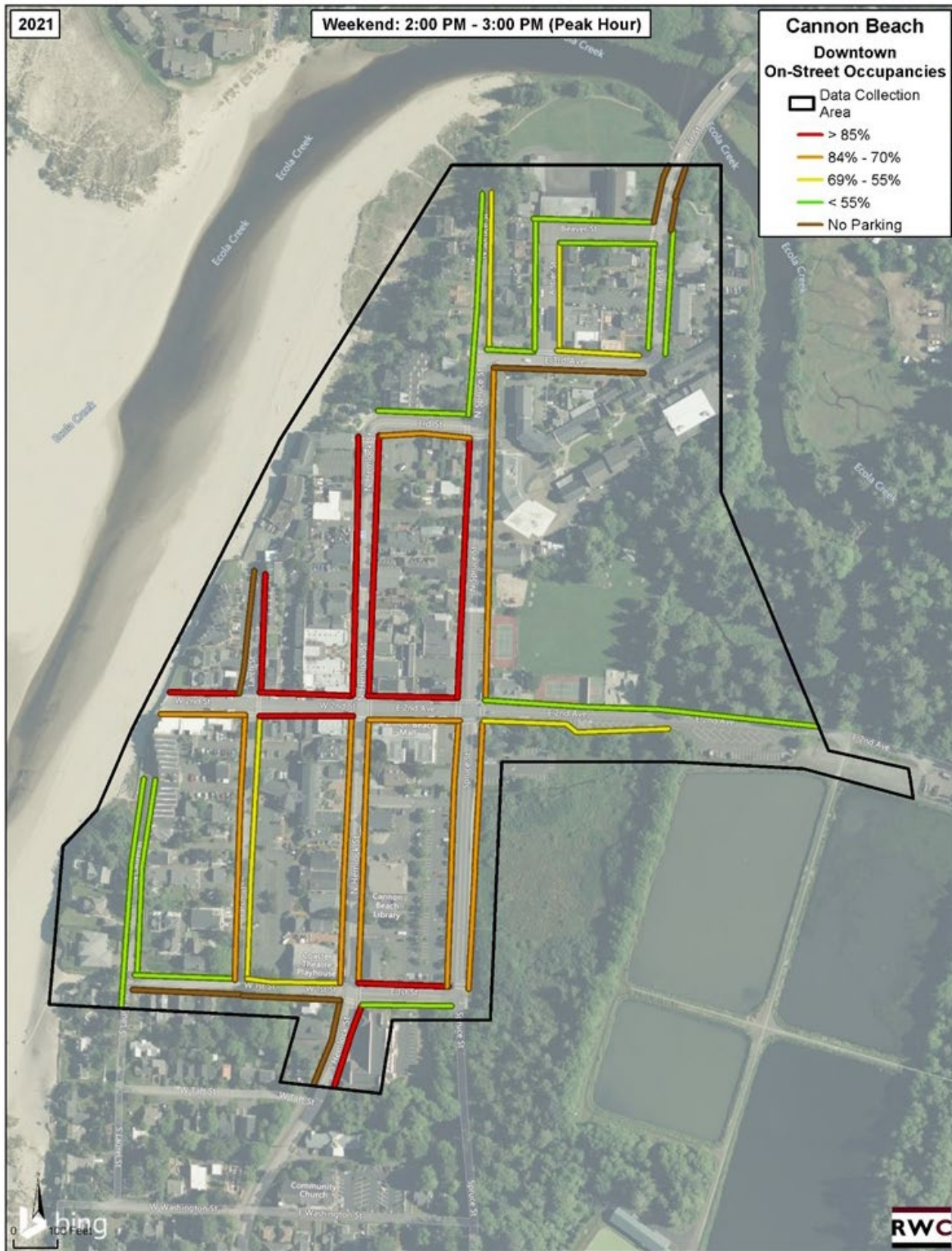


Figure 22. Downtown on-street parking occupancies by block face – Weekend peak hour

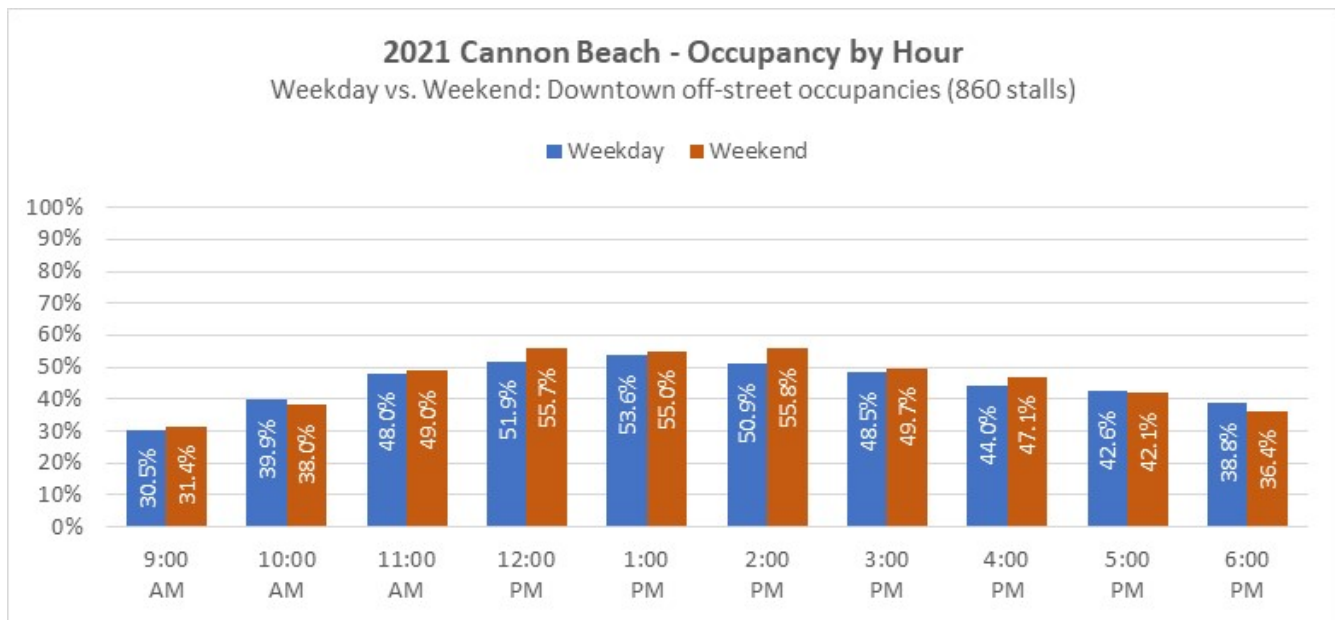


Off-Street Parking

Figure 23 below provides a comparative hour-by-hour look at off-street parking occupancy on both survey days. Generally, occupancies remain low to moderate throughout most of the operating day (11:00 AM to 6:00 PM).

- The weekday peak hour reaches about 54 percent at 1PM, whereas the weekend peak hour reaches nearly 56 percent at 2:00 PM.
- While weekend occupancies tend to be higher (particularly between 11:00 AM and 4:00 PM), the difference is minimal, and no surveyed hour extends beyond “moderate” per the performance standards describe above.

Figure 23. 2021 Downtown Off-Street Occupancies (Hourly Comparison)



Figures 24 and 25 below illustrate the off-street, peak-hour parking occupancy for both the weekday and weekend. Each site can be identified by its assigned lot number shown on the map. The findings include:

Weekday

- Four (4) of 34 surveyed off-street parking lots are constrained above 85 percent occupancy on the weekday (Thursday). This includes lots 7, 24, 34, and 44. These lots are comprised of a total of 62 stalls (7% of the total off-street supply). The largest constrained lot is the public parking/public restroom lot (lot 44), with a total of 36 stalls.
- The level of constraint these lots put on the larger off-street system is minimal. Similarly, these lots are widely distributed throughout the study area, leaving available off-street opportunities within proximity to users looking for an off-street location to park.
- Six (6) of 34 surveyed facilities fall into the 70 – 84 percent range of occupancy at the peak hour. This includes lots 4, 21, 28, 35, 37 and 40. These lots are comprised of a total of 243 stalls (28 percent of the total off-street supply). The largest of these lots are Lot 35 (which serves Shops/Galleries/Theater) with 78 stalls and Lot 40 (Public Parking) with 109 stalls.

- The remaining 24 lots (65 percent of supply) within the study area are moderate to low use at the peak hour.
- Overall, there is a sizable amount of empty parking in the off-street supply commonly distributed throughout the study area.

Weekend

- Six (6) of 34 facilities are constrained above 85% occupancy on the weekend. This includes lots 7, 21, 24, 28, 38, and 44. These lots are comprised of a total of 93 stalls (11% of the total off-street supply). The largest constrained lot is the public parking/public restroom lot (Lot 44), with a total of 36 stalls.
- As with the weekday count, the level of constraint these lots put on the larger off-street system is minimal. These lots are widely distributed throughout the study area, leaving available off-street opportunities within proximity to users looking for an off-street location to park.
- Seven (7) of 34 surveyed facilities fall into the 70 – 84 percent range of occupancy at the peak hour. This includes lots 4, 21, 28, 35, 37, and 40. These lots are comprised of a total of 197 stalls (23 percent of the total off-street supply). The largest of these lots is Lot 40 (Public Parking) with 109 stalls.
- The remaining 21 lots (66 percent of supply) within the study area are moderate to low use at the peak hour.
- As with the weekday count, there is a sizable amount of empty parking in the off-street supply commonly distributed throughout the study area.

Figure 24. Downtown off-street parking occupancies by studied site – Weekday peak hour

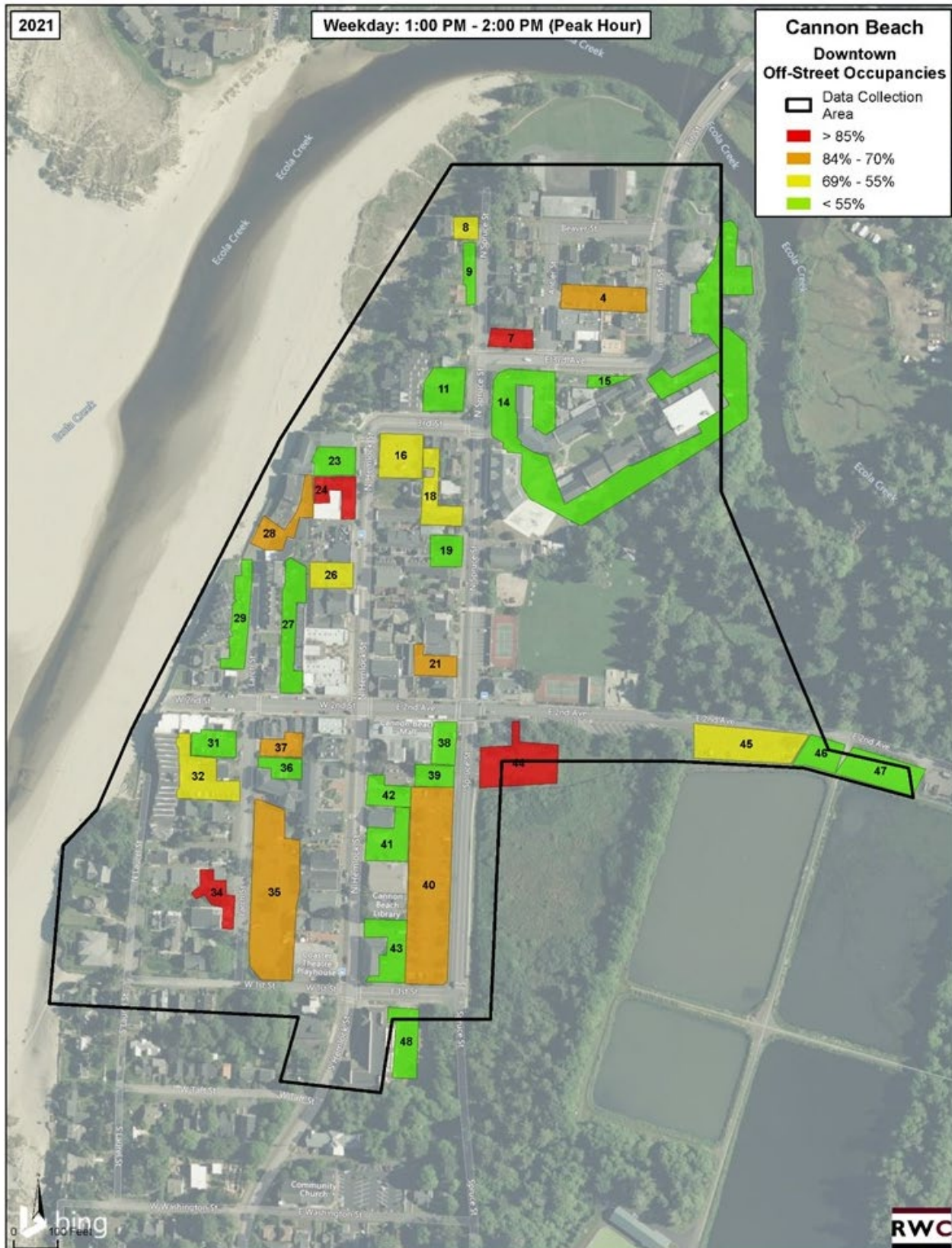


Figure 25. Downtown off-street parking occupancies by studied site – Weekend peak hour



Midtown Findings

On-Street Parking

Figure 26 provides a comparative hour-by-hour look at the parking occupancy on both survey days in the midtown study area. Generally, occupancies remain low the operating day. The weekday peak hour reaches 51 percent at 1:00 PM whereas the weekend peak hour reaches 40 percent at 2:00 PM. Both days show a standard bell curve of activity, with use gradually reducing each hour beginning at 3:00 PM into the late afternoon and evening hours.

- At the weekday peak hour (1:00 PM), 110 vehicles are parked, leaving 106 stalls empty within the on-street system.
At the weekend peak hour (2:00 PM), 87 vehicles are parked, leaving 129 stalls empty within the on-street system.

Figure 26. 2021 Midtown On-Street Occupancies (Hourly Comparison)

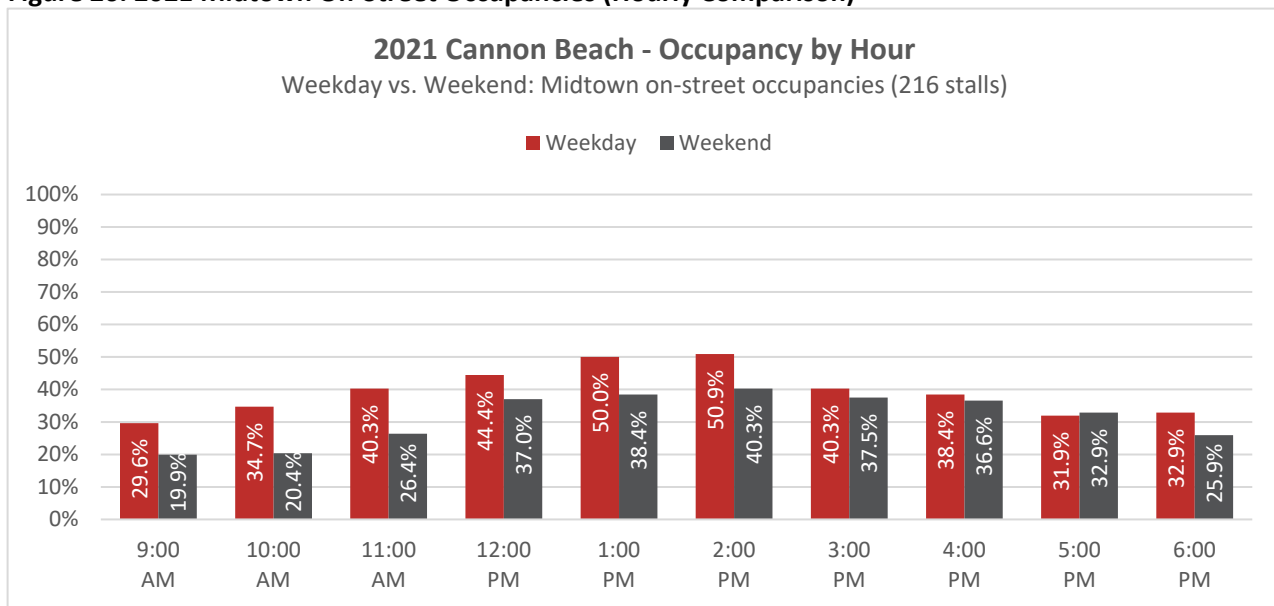


Figure 27 and Figure 28 below summarize parking occupancies by block face using a “heat map” of the midtown study area. A heat map uses color to display degrees of occupancy as measured against an industry standard of 85 percent; when occupancy exceeds that level, the system is considered constrained. Block faces marked in red indicate areas of constraint. Green represents areas of underutilized parking, while yellow and orange represent the middle ranges of occupancy. This industry standard for measurement was described in Section 1.5, above.

In the midtown study area, there are a total of 66 block faces. Of these block faces, only 29 (44 percent) allow parking, the other 37 block faces (56 percent) do not allow on-street parking. These block faces are indicated on

the maps (Figures 27 and 28) in brown. As the maps show, there are large gaps between 'parkable' block faces and those that do not allow parking.

Weekday

- As the weekday map illustrates (Figure 27), 13 of 29 block faces (that allow parking) are constrained at the peak hour. This means 45 percent of the available block faces are constrained.
- Several of those constrained block faces are clustered between E/W Harrison Street and W Dawes Ave, an area with a high concentration of block faces that do not allow parking.
- Though the occupancy study determined that there are up to 106 empty stalls in this study zone at the peak hour, most is west of Harrison Street, with large gaps of no parking blocks separating constrained locations from empty supply.

Weekend

- On the weekend (Figure 28) there are fewer constrained block faces (just 6 as compared to 13 weekdays). However, the concentration of constrained block faces is similar to weekdays, clustered between E/W Harrison Street and W Dawes Ave.
- Though 129 empty stalls are available at the weekend peak hour, the large number of no parking areas likely makes use of the study area difficult and/or frustrating for users.

Figure 27. Midtown on-street parking occupancies by block face – Weekday peak hour



Figure 28. Midtown on-street parking occupancies by block face – Weekday peak hour

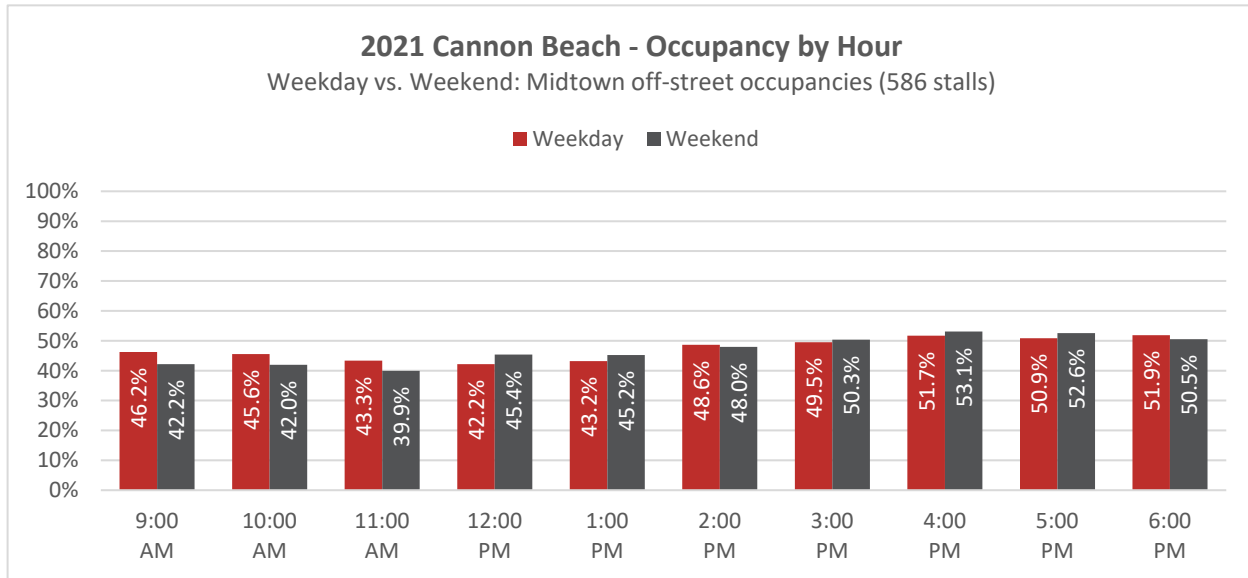


Off-Street Parking

Figure 29 provides a comparative hour-by-hour look at off-street parking occupancy on both survey days in the midtown study area.

- Off-street occupancies are low throughout the operating day on both days.
- The weekday peak hour reaches 49.5 percent at 3:00 PM and spikes upward again to 52 percent at 6:00 PM.
- The weekend peak hour reaches nearly 53 percent at 4:00 PM.
- Unlike the on-street system, use of the off-street supply in midtown trends higher in the later hours of the survey days (2:00 to 6:00 PM).

Figure 29. 2021 Midtown Off-Street Occupancies (Hourly Comparison)



Figures 30 and 31 (next two pages) illustrate the off-street parking heat maps for the peak hours for both the weekday and weekend within the midtown study area. Each site can be identified by its assigned lot number. The findings include:

Weekday

- Three (3) of 38 surveyed facilities are constrained above 85 percent occupancy on the weekday (Thursday). This includes lots 66, 67, and 80. These lots are comprised of a total of 51 stalls (9 percent of the total off-street supply). All three lots were at 100 percent occupancy during the peak hour.
- The level of constraint these lots put on the larger off-street system is minimal.
- There are numerous proximate sites to the three constrained sites that have available off-street parking within proximity to users looking for an off-street location to park.
- Three (3) of 38 surveyed facilities fall into the 70 – 84 percent range of occupancy at the peak hour. This includes lots 64, 76, and 83. These lots are comprised of a total of 93 stalls (16% of the total off-street supply). The largest of these lots is Lot 75 (Public Parking) with 57 stalls.
- The remaining 32 lots (75% of supply) are moderate to low use at the peak hour.
- Overall, there is a sizable amount of empty parking in the off-street supply commonly distributed throughout the study area.

Weekend

- Five (5) of 38 facilities are constrained above 85% occupancy on the weekend. This includes lots 66, 67, 76, 81, and 87. These lots are comprised of a total of 148 stalls (25% of the total off-street supply). Five of the six lots are at 100% occupancy at the peak hour; Lot 87 (Pelican Brewery/Motel) reaches 88%.
- Despite the constraint in these five lots, there are ample off-street opportunities proximate to these sites.
- Three (3) of 38 surveyed facilities fall into the 70% - 84% range of occupancy at the peak hour. This includes lots 51, 64, and 68. These lots are comprised of a total of 57 stalls (10% of the total off-street supply). The largest of these lots is Lot 67 (Surfsand Guest Parking) with 67 stalls.

- The remaining 30 lots (65% of supply) are moderate to low use at the peak hour.

As with the weekday count, there is a sizable amount of empty parking in the weekend off-street supply commonly distributed throughout the study area.

Figure 30. Midtown off-street parking occupancies by site – Weekday peak hour

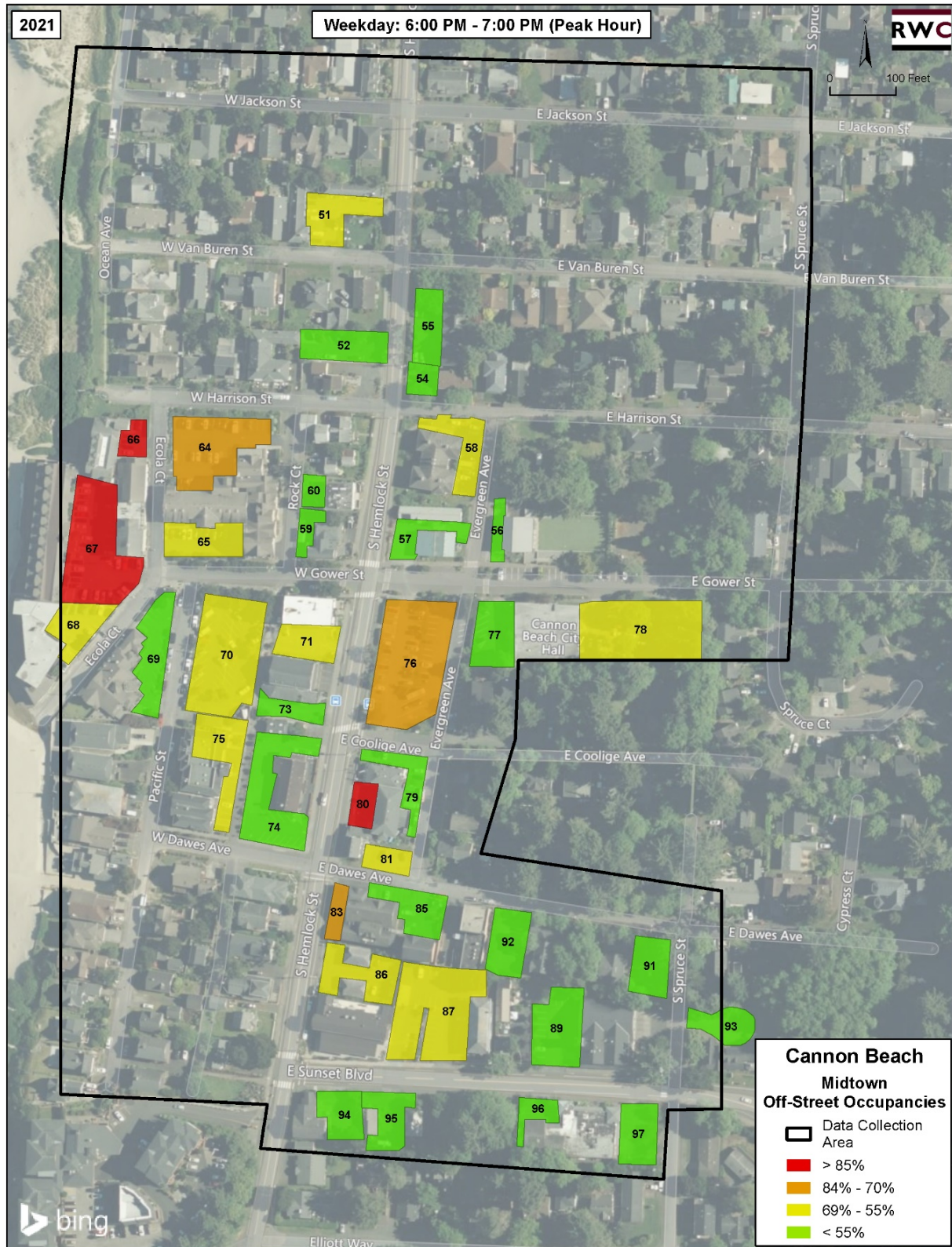
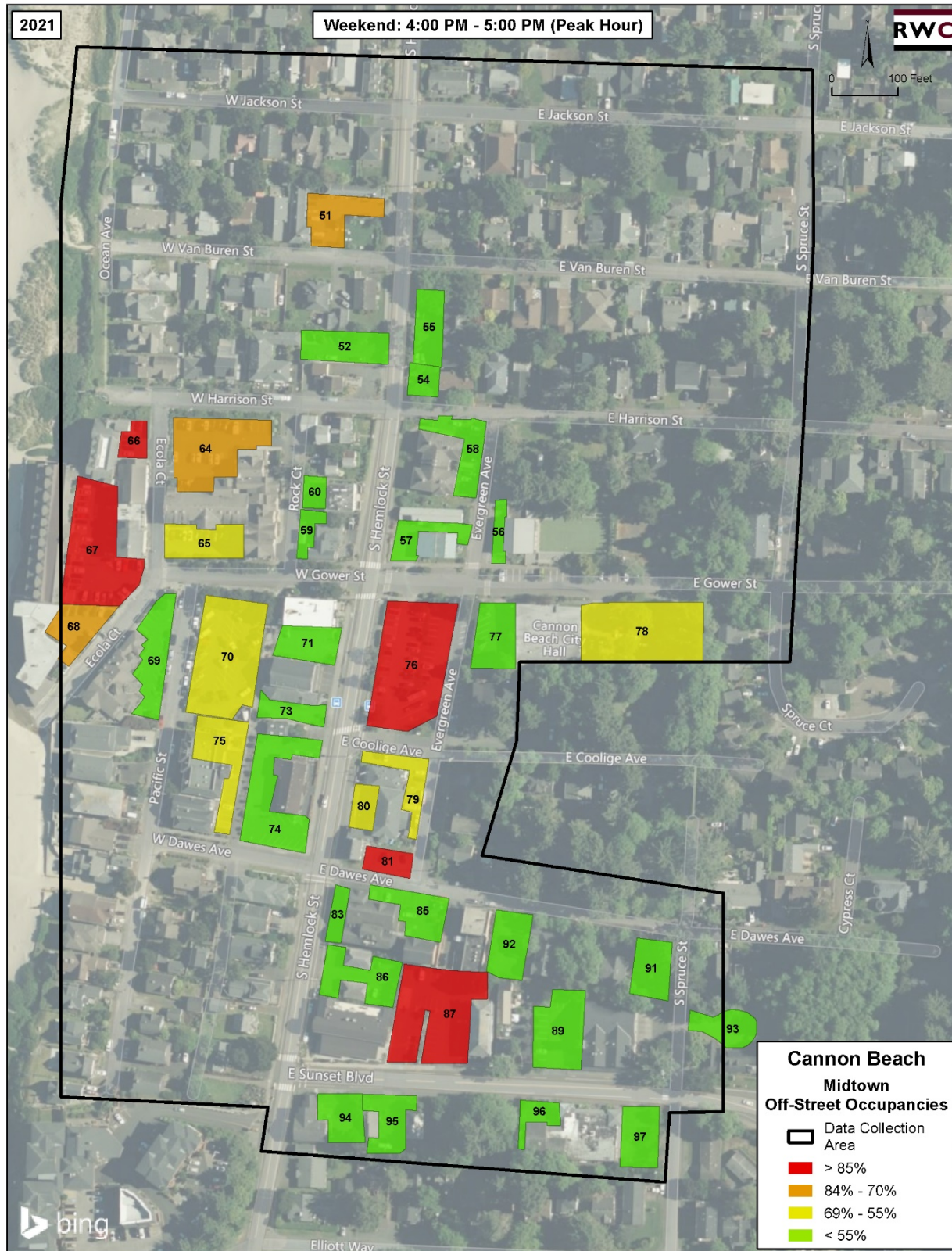


Figure 31. Midtown off-street parking occupancies by site – Weekend peak hour



Access Management

Access management is important to reduce conflict points that can degrade mobility and/or safety. According to ODOT standards, the minimum interchange spacing is 3 miles and the minimum access spacing is 1,320 feet. Existing interchange and access spacing along US 101 within the Cannon Beach UGB was compared to ODOT standards, as summarized in Table 9.

There are a total of 3 interchanges and 19 at-grade approaches over 3.2 miles along US 101 within the Cannon Beach UGB.

US 101 within the Cannon Beach UGB does not meet interchange or access spacing standards for a statewide highway with an AADT greater than 5,000.

Table 9. Comparison of Existing Interchange and Access Spacing to Standards

Roadway	Extents	Length	Spacing Standard	Number of Points	Average Spacing	Meets Standard?
Interchange Spacing						
US 101 (UGB Limits)	MP 28.38 to 31.58	3.20 miles	3 miles	3	1.07 miles	No
Overall	MP 28.38 to 31.58	3.20 miles	3 miles	3	1.07 miles	No
Access Spacing						
US 101 (North UGB Limits to E Sunset Boulevard intersection)	MP 28.38 to 29.46	5,700 feet	1,320 feet	7	815 feet	No
US 101 (E Sunset Boulevard intersection to Warren Beach Road Southbound Off-Ramp)	MP 29.46 to 30.48	5,385 feet	1,320 feet	5	1,075 feet	No
US 101 (Warren Beach Road Southbound Off-Ramp to South UGB Limits)	MP 30.48 to 31.58	5,810 feet	1,320 feet	7	830 feet	No
Overall	MP 28.38 to 31.58	16,895 feet	1,320 feet	19	890 feet	No

Safety

Crash data from 2014 to 2018, the last 5 years of complete records, was obtained from ODOT to analyze existing crash trends within the Cannon Beach UGB. The crash records from the ODOT database include reported crashes on all roads within Cannon Beach city limits and additional crashes outside the city limits in the Cannon Beach UGB. The available crash data is reported from the local DMV to ODOT; only crashes that resulted in an injury or property damage with over \$1,500 in damage are reported to ODOT. ODOT groups crash data in three-year periods, so the 2019 and 2020 crash data are not yet available and will be reported with the 2021 crash data.

The safety analysis reviewed the frequency, severity, type, and location of crashes, with consideration for crashes involving pedestrians or bicyclists.

Crash Locations and Trends

Between 2014 and 2018, 47 reported collisions occurred within the Cannon Beach UGB. The locations of these crashes as well as the severity of each crash are shown in Figure 32 and Figure 33.

Figure 32. Cannon Beach Crash Locations (2014-2018) (page 1 of 2: north)

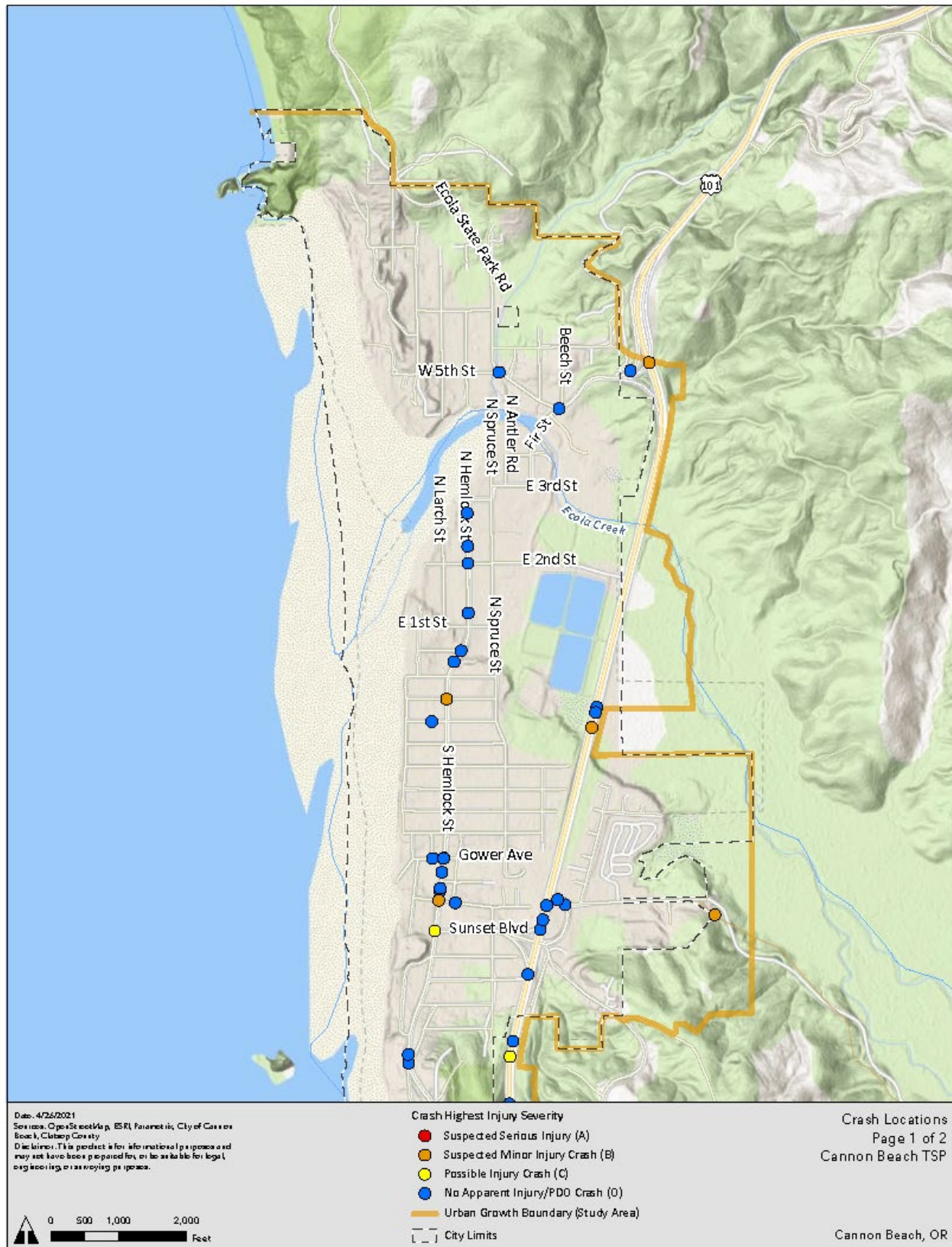
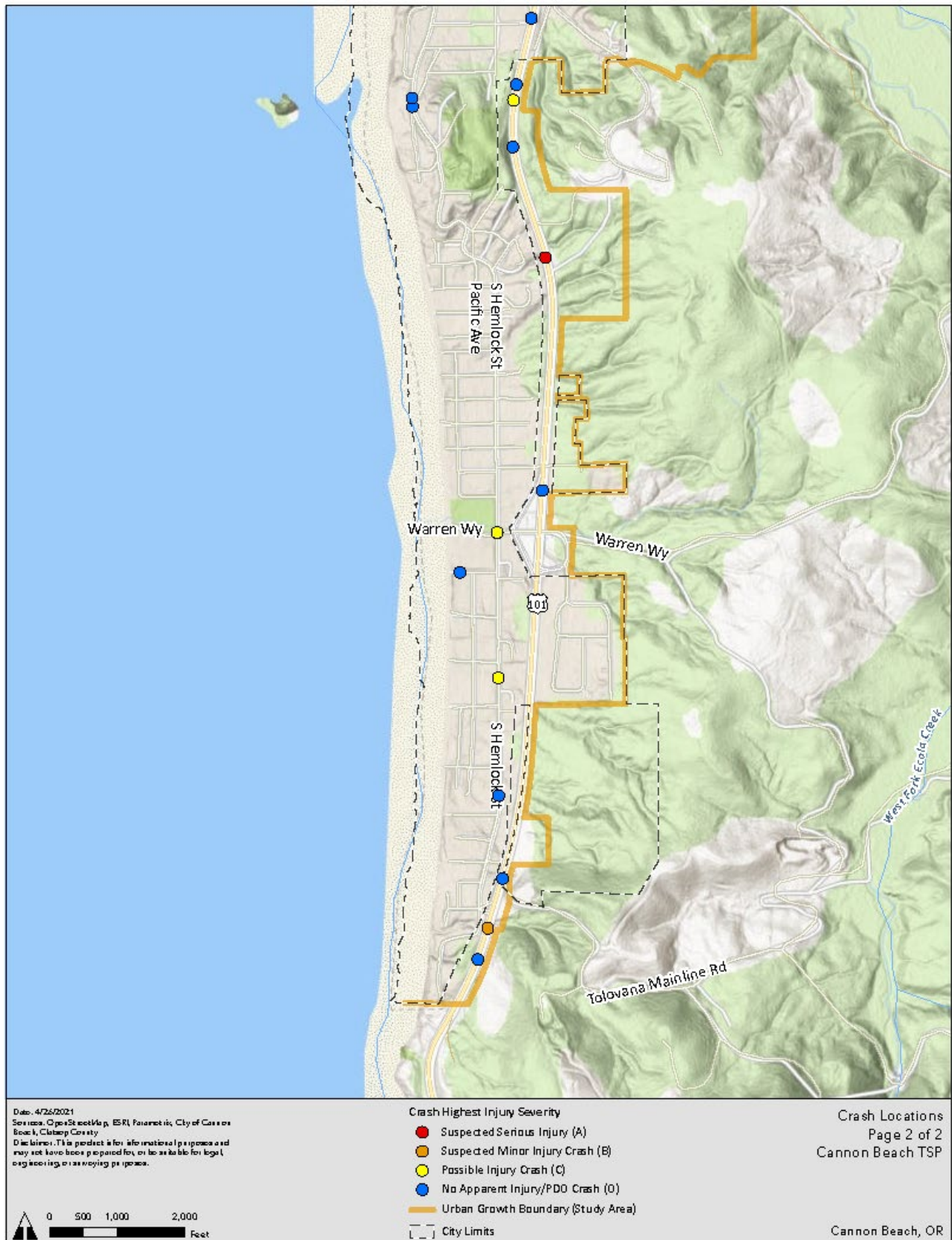


Figure 33. Cannon Beach Crash Locations (2014-2018) (page 2 of 2: south)



Crashes in the Cannon Beach UGB are generally not severe. Between 2014 and 2018, no fatalities occurred in Cannon Beach. One crash led to serious injuries (2 percent) and six crashes led to minor injuries (13 percent). Conversely, 85 percent of crashes led to property-only damage or possible injuries. The crash severity percentages are shown in **Figure 34**.

The most common crash types include fixed object, sideswipe same direction, and entering at angle. The proportion of crashes for each crash type is shown in **Figure 35**.

The three most common contributing factors include failure to yield right of way (10 crashes), driving too fast for conditions without exceeding posted speed (seven crashes), and making an improper turn (five crashes). Most crashes occurred during the day or dusk (77 percent) or with dry roadway conditions (77 percent). Alcohol was a factor in one crash and drug use was a factor in another crash.

Figure 34. Cannon Beach UGB Crash Severity (2014-2018)

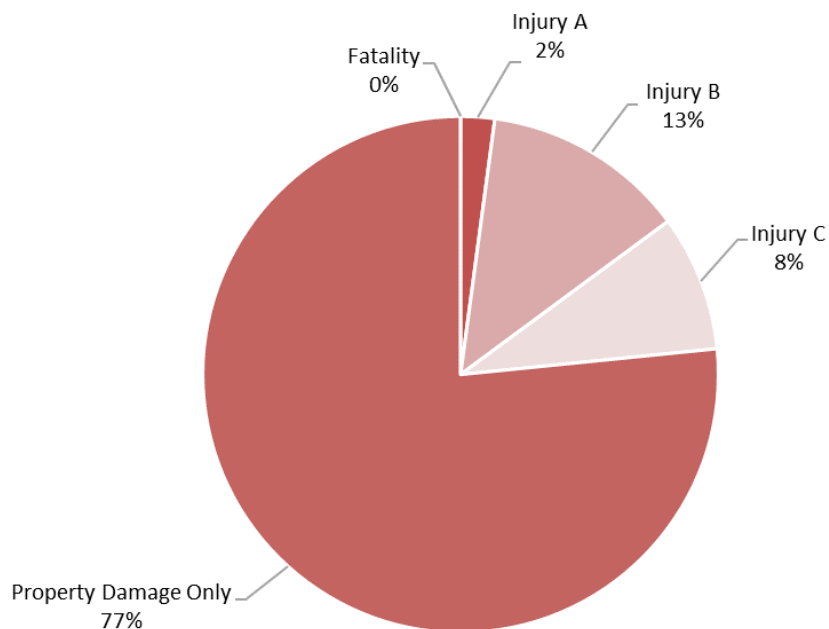
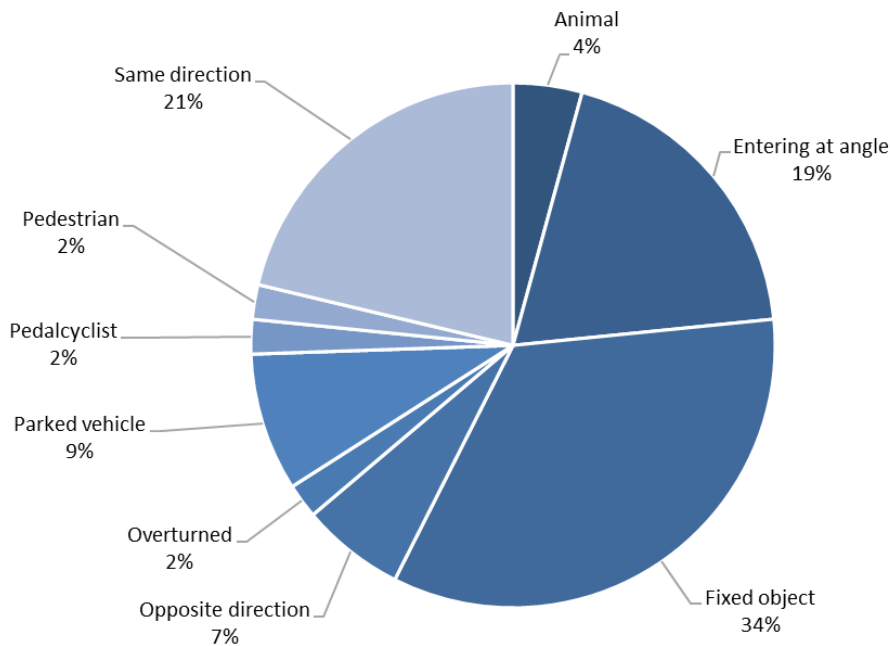


Figure 35. Cannon Beach UGB Crash Types (2014-2018)



Pedestrian Safety

Between 2014 and 2018, one crash involved pedestrians. The crash occurred at the intersection of S Hemlock Street and Dawes Avenue and resulted in suspected minor injuries (Injury B) for both pedestrians. The only recorded factor was not yielding right of way. The crash occurred at night without streetlights, but with clear skies and dry roadway conditions.

Bicycle Safety

Between 2014 and 2018, one crash involved a bicyclist. The crash occurred at the intersection of S Hemlock Street and Adams Street and resulted in suspected minor injuries (Injury B) for the bicyclist. The only recorded factor was not yielding right of way. The crash occurred during daylight hours with clear skies and dry roadway conditions.

Intersection Safety

Between 2014 and 2018, 36 percent of all crashes within the UGB (17 total crashes) occurred at intersections and 19 percent of all crashes within the UGB (9 total crashes) occurred at study intersections. A crash analysis was completed for the study intersections.

The study intersection crashes are shown by crash severity in Table 10 and by crash type in Table 11. The study intersection crashes were not severe. Between 2014 and 2018, crashes at the study intersections led to property-only damage or possible injuries. For the study intersection crashes, crash type consisted primarily of entering at angle (four crashes) and sideswipe same direction crashes (4 crashes), with the only other crash type being sideswipe opposite direction (one crash). Between 2014 and 2018, crashes only occurred at six of the 15 study intersections. The intersection with the highest number of collisions was S Hemlock Street & Gower Avenue.

Table 10. Study Intersection Crash Severity (2014-2018)

#	Intersection	Fatality	Injury A	Injury B	Injury C	Property Damage Only	Total
1A	Beech Street & Fir Street	0	0	0	0	0	0
1B	E 5 th Street & Fir Street	0	0	0	0	1	1
2	N Antler Street & E 3 rd Street	0	0	0	0	0	0
3	N Spruce Street & E 3 rd Street (southern intersection)	0	0	0	0	0	0
4	N Spruce Street & 2 nd Street	0	0	0	0	0	0
5	N Hemlock Street & 2 nd Street	0	0	0	0	1	1
6	N Larch Street & W 2 nd Street	0	0	0	0	0	0
7	N Hemlock Street & 1 st Street	0	0	0	0	0	0
8	S Hemlock Street & Gower Avenue	0	0	0	0	3	3
9	S Hemlock Street & Sunset Boulevard	0	0	0	1	0	0
10	US 101 & E Sunset Boulevard	0	0	0	0	1	1
11	Pacific Avenue/W Gogona Avenue & S Hemlock Street	0	0	0	0	0	0
12	US 101 Southbound ramps & Warren Beach Road	0	0	0	0	0	0
13	S Hemlock Street & Warren Beach Road	0	0	0	1	1	1
14	S Hemlock Street & US 101	0	0	0	0	0	0
		0	0	0	2	7	9

Source: ODOT Crash Data and Reporting Data

Table 11. Study Intersection Crash Type (2014-2018)

#	Intersection	Animal	Entering at angle	Fixed object	SSO ²²	Other	Overtaken	Parked vehicle	Pedal cyclist	Pedestrian	Railway train	SSS ²³	TOTAL
1A	Beech Street & Fir Street	0	0	0	0	0	0	0	0	0	0	0	0
1B	E 5 th Street & Fir Street	0	0	0	0	0	0	0	0	0	0	1	1
2	N Antler Street & E 3 rd Street	0	0	0	0	0	0	0	0	0	0	0	0
3	N Spruce Street & E 3 rd Street (southern intersection)	0	0	0	0	0	0	0	0	0	0	0	0
4	N Spruce Street & 2 nd Street	0	0	0	0	0	0	0	0	0	0	0	0
5	N Hemlock Street & 2 nd Street	0	1	0	0	0	0	0	0	0	0	0	1
6	N Larch Street & W 2 nd Street	0	0	0	0	0	0	0	0	0	0	0	0
7	N Hemlock Street & 1 st Street	0	0	0	0	0	0	0	0	0	0	0	0
8	S Hemlock Street & Gower Avenue	0	1	0	0	0	0	0	0	0	0	2	3
9	S Hemlock Street & Sunset Boulevard	0	0	0	1	0	0	0	0	0	0	0	1
10	US 101 & E Sunset Boulevard	0	0	0	0	0	0	0	0	0	0	1	1
11	Pacific Avenue/W Gogona Avenue & S Hemlock Street	0	0	0	0	0	0	0	0	0	0	0	0
12	US 101 Southbound ramps & Warren Beach Road	0	0	0	0	0	0	0	0	0	0	0	0
13	S Hemlock Street & Warren Beach Road	0	2	0	0	0	0	0	0	0	0	0	2
14	S Hemlock Street & US 101	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		0	4	0	1	0	0	0	0	0	0	4	9

Source: ODOT Crash Data and Reporting Data

²² SSO – Sideswipe Opposite Direction

²³ SSS – Sideswipe Same Direction

Crash rates describe the annual number of crashes relative to the total traffic entering the intersection and can be used to flag intersections with safety deficiencies by comparing to other similar locations. A critical crash rate analysis was performed for the study intersections in the study area based on methodology outlined in Chapter 4 of ODOT's APM. Under this methodology, a critical crash rate was developed for each intersection in the study area.

First, observed crash rates were calculated by dividing the total number of observed crashes by the million entering vehicle (MEV) volume at each intersection. MEV volume for each intersection is based on the average annual daily traffic (AADT). A project-area K-factor was calculated by comparing the peak hour volumes to the 24-hour volumes provided in the intersection turning movement counts. This K-factor was then applied to the adjusted peak hour volumes to develop AADT volumes for each intersection.

Then, a weighted average crash rate for each type of intersection, or population, was calculated. In order to calculate a critical crash rate for a population, at least five comparable intersections must be present. For this study, there are seven three-leg stop-controlled intersections (3ST) and eight four-leg stop-controlled intersections (4ST). The weighted average crash rates were 0.02 for three-leg stop-controlled intersections and 0.08 for four-leg stop-controlled intersections.

Lastly, a critical crash rate was calculated for each study intersection. The critical crash rate represents the rate at which the observed crash rate is significantly different from the average population crash rate with a 95 percent confidence level. Table 12 summarizes the intersection type, ADT, observed crash rate, and critical crash rate for each study intersection. None of the observed intersection crash rates exceeded the critical crash rates.

Table 12. Study Intersection Critical Crash Rate Analysis

#	Intersection	Intersection Type	AADT	Observed Crash Rate	95th Percentile Critical Crash Rate	Exceeds Critical Crash Rate?
1A	Beech Street & Fir Street	3ST	6,480	0.00	0.13	No
1B	E 5th Street & Fir Street	4ST	7,790	0.07	0.23	No
2	N Antler Street & E 3rd Street	3ST	6,530	0.00	0.13	No
3	N Spruce Street & E 3rd Street (southern intersection)	3ST	7,190	0.00	0.12	No
4	N Spruce Street & 2nd Street	4ST	5,710	0.00	0.26	No
5	N Hemlock Street & 2nd Street	4ST	6,090	0.09	0.25	No
6	N Larch Street & W 2nd Street	4ST	1,700	0.00	0.49	No
7	N Hemlock Street & 1st Street	4ST	7,900	0.00	0.23	No
8	S Hemlock Street & Gower Avenue	4ST	10,210	0.16	0.21	No
9	S Hemlock Street & Sunset Boulevard	3ST	10,370	0.05	0.10	No
10	US 101 & E Sunset Boulevard	3ST	13,610	0.04	0.08	No
11	Pacific Avenue/W Gogona Avenue & S Hemlock Street	4ST	4,890	0.00	0.28	No
12	US 101 Southbound ramps & Warren Beach Road	3ST	3,620	0.00	0.18	No
13	S Hemlock Street & Warren Beach Road	4ST	7,140	0.15	0.24	No
14	S Hemlock Street & US 101	3ST	9,930	0.00	0.10	No

Segment Safety

The Statewide Priority Index System (SPIS) is a methodology developed by ODOT to flag potential safety issues with a statewide network screen for crash hotspots. All State highways are analyzed in 0.10-mile segments. A roadway segment is designated as a SPIS site if the segment experiences three or more crashes or one or more fatal crashes over the previous three-year period. Within the study area, there were no segments that ranked in the top 15 percent between 2016 and 2018.

The segment crash analysis focused on US 101 through the Cannon Beach UGB. The segment crashes are shown by crash severity in Table 13 and by crash type in Table 14. Between 2014 and 2018, one segment crash led to serious injuries/Injury A. For the segment crashes, crash type consisted primarily of fixed object (eight crashes or 53 percent). Animal, sideswipe opposite direction, and sideswipe same direction were the only other crash types.

Table 13. Segment Crash Severity (2014-2018)

#	Segment	Extents	Length (mi)	Fatality	Injury A	Injury B	Injury C	Property Damage Only	Total
1	US 101 (North UGB Limits to E Sunset Boulevard)	MP 28.38 to 29.46	1.08	0	0	2	0	2	4
2	US 101 (E Sunset Boulevard to Warren Beach Road Southbound Off-Ramp)	MP 29.46 to 30.48	1.02	0	1	0	1	5	7
3	US 101 (Warren Beach Road Southbound Off-Ramp to South UGB Limits)	MP 30.48 to 31.58	1.10	0	0	1	0	3	4
TOTAL		MP 28.38 to 31.58	3.20	0	1	3	1	10	15

Source: ODOT Crash Data and Reporting Data

Table 14. Segment Crash Type (2014-2018)

#	Segment	Extents	Length (mi)	Animal	Entering at angle	Fixed object	SSO ²⁴	Other	Over-turned	Parked vehicle	Pedal cyclist	Ped	Railway train	SSS ²⁵	TOTAL
1	US 101 (North UGB Limits to E Sunset Boulevard)	MP 28.38 to 29.46	1.08	0	0	2	2	0	0	0	0	0	0	0	4
2	US 101 (E Sunset Boulevard to Warren Beach Road Southbound Off-Ramp)	MP 29.46 to 30.48	1.02	2	0	3	0	0	0	0	0	0	0	2	7
3	US 101 (Warren Beach Road Southbound Off-Ramp to South UGB Limits)	MP 30.48 to 31.58	1.10	0	0	3	0	0	0	0	0	0	0	1	4
TOTAL		MP 28.38 to 31.58	3.20	2	0	8	2	0	0	0	0	0	0	3	15

Source: ODOT Crash Data and Reporting Data

²⁴ SSO – Sideswipe Opposite Direction

²⁵ SSS – Sideswipe Same Direction

First, observed crash rates were calculated by dividing the total number of observed crashes by the million vehicle miles (MVM) for each segment. MVM is based on the length of the segment and the AADT. The AADT shown in Table 15 is an average for each segment based on the volumes in ODOT's Transportation Volume tables.

The observed crash rates were then compared to crash rates from Table II of the ODOT 2018 State Highway Crash Rate Table. Within the Cannon Beach UGB, US 101 (OR 009) is classified as 'Other Principal Arterial' in a Rural HPMS Area, according to the ODOT Functional Classification and National Highway System Status, so the crash rate for Other Principal Arterials in Rural Cities was used.

Table 15 summarizes the AADT, observed crash rate, and critical crash rate for each segment. None of the segment crash rates exceeded the State highway crash rate.

Table 15. Segment Crash Rate Analysis

#	Segment	Extents	Length (mi)	AADT	Observed Crash Rate	State Highway Crash Rate	Exceeds Critical Crash Rate?
1	US 101 (North UGB Limits to E Sunset Boulevard)	MP 28.38 to 29.46	1.08	6,550	0.31	1.15	No
2	US 101 (E Sunset Boulevard to Warren Beach Road Southbound Off-Ramp)	MP 29.46 to 30.48	1.02	6,000	0.63	1.15	No
3	US 101 (Warren Beach Road Southbound Off-Ramp to South UGB Limits)	MP 30.48 to 31.58	1.10	5,100	0.39	1.15	No

Walking and Bicycling

Cannon Beach is compact and relatively easy to traverse by walking and biking. Convenient and safe facilities to walk and bike help to keep Cannon Beach comfortable and safe, while also reducing the need to drive. The following needs are compiled from policies in the Comprehensive Plan, projects and policies in the 2017 Parks and Trails Master Plan, and needs identified through this analysis.

Cannon Beach's 2017 Parks and Trails Master Plan describes specific policies and projects to improve the pedestrian and bicycle networks and improve access to recreation. In addition to nature paths and multi-use pathways, the plan includes sidewalks and low volume streets in its definition of "trails." The plan does not include strategies to implement or fund projects. The following projects from the plan would enhance the conditions for walking and biking in Cannon Beach:

- T-1: Ecola Creek Park Trail. Adds a trail connection under the Fir Street Bridge to connect trails on either side of Fir Street.
- T-2: North End Bike/Pedestrian Connection. Creates a route for people walking and biking between downtown Cannon Beach and partway to the access of Ecola State Park. Links Elm Street to the intersection of N Ash Street and Ecola Park Road with a mix of paved and gravel streets, sidewalks, and a new trail.
- T-3: North End Trail. A new trail along US 101 connects popular hiking trails into a broader network.
- T-5: Southern Greenway. Formalizes a low traffic north-south route into a greenway alternative to Hemlock Street. The north end is the intersection of Hemlock and Pacific and the south end is Tolovana State Recreation Site. Requires new road or trail connections along existing rights of way.

- T-6: Spruce Street Sidewalk. Continue recently built sidewalk on the east side of Spruce Street further south to Monroe Street, at the south end of Madison City Park.
- T-7: Trail Connecting Elk Run Park to Hemlock Street. Makes a short connection between Hemlock and Spruce Streets at Taft within Elk Run Park. This makes a much shorter route for people to walk and bike than following the current street grid.
- T-10: North-South Shared Use Path. Creates a new shared-use path to the east of US 101, beginning at Yukon Street to the south and heading north to the Baptist Church or to Sunset. Provides a safe connection within, but near the outer edge, of ODOT right of way.
- T-13: Wayfinding Program. Establish a wayfinding program throughout Cannon Beach to encourage and make it easier to walk and bike.

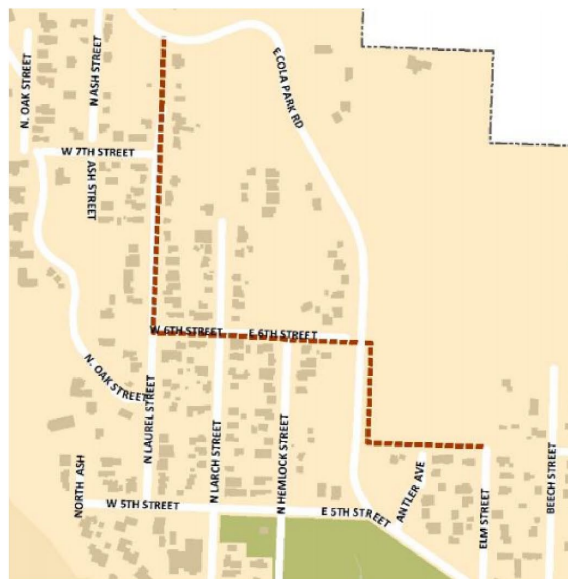
These trail connections are shown in Figure 36 and Figure 37 below.

Figure 36. Planned Trails - Parks and Trails Master Plan (page 1 of 2)

T-1: Ecola Creek Park Trail



T-2: North End Bike/Pedestrian Connection



T-3: North End Trail



T-5: Southern Greenway

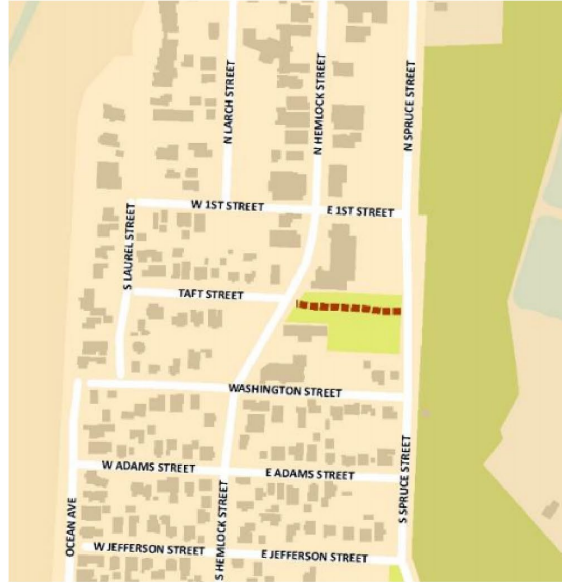


Figure 37. Planned Trails - Parks and Trails Master Plan (page 2 of 2)

T-6: Spruce Street Sidewalk



T-7: Trail Connecting Elk Run Park to Hemlock Street



T-10: North-South Shared Use Path



Additional off-street trail needs were identified through the analysis of existing conditions in Cannon Beach.

Pedestrian System

- Walking and biking activity is high near the three commercial areas in Cannon Beach: downtown, midtown, and near Tolovana Park. Many people also walk and bike to the beach, either through

neighborhoods or through parks like Whale Park or Tolovana. Cannon Beach's collection of regional, community, and local parks are also popular destinations for residents and visitors to walk and bike to.

- The one public school in the City, the Cannon Beach Academy, has a crosswalk near it but no other dedicated pedestrian facilities.
- Streets with high traffic volumes would benefit from sidewalks or other improvements that separate pedestrians from traffic and provide ADA-compliant access.
- Sidewalks are inconsistent along Hemlock Street in the north portion of the downtown commercial area. Pedestrian needs are high in this area. Sidewalks are narrow in some places and nonexistent in others. This includes 3rd Street, Spruce Street, and Fir Street between Hemlock Street and Beaver Street
- Hemlock Street lacks sidewalks outside of commercial areas, requiring people to walk on the shoulder or use an alternative route. Alternative routes do not always exist, like at Haystack Hill, where Hemlock Street is the only through route and has narrow shoulders (Photograph 4). The Cannon Beach Academy elementary school on Hemlock Street does not have sidewalks leading to it.
- No crossings have signals. Enhanced crossing treatments could be considered in areas with high traffic volumes.
- Curb ramps may not be ADA compliant. All ramps should be inspected and those that are non-compliant or in poor condition should be improved.
- Street lighting outside of commercial areas is relatively low and may have contributed to a crash on Hemlock Street. The narrow shoulders of Hemlock Street that are often used by people walking and biking warrant considering the value of additional pedestrian-scale street lighting. This will have to be balanced with the value of limiting light pollution.

Bicycling System

- There is no designated network for bicycling or master plan for bicycling in the City. A bike master plan is a policy objective in the Comprehensive Plan.
- Hemlock Street is the main route for traveling through town and the designated route for the Oregon Coast Bike Route. Much of the route north of 1st Avenue lacks a shoulder or bike lane. Hemlock Street south of 1st Avenue has shoulders that vary in width and are often shared with people walking or parked cars. The northbound shoulder disappears completely at the Lighthouse Inn, just north of Harrison Street. The lack of a consistent bike facility may be an impediment for people who want to bike.
- There are few bike facilities north of 1st Street. Aside from two exceptions (a limited stretch of shoulders between 5th Street and Beaver Street and a two-block segment of a single 4-foot southbound bike lane on Fir Street – E 3rd Street) people biking have to share the travel lane with people driving.
- US 101 does not meet ODOT standards for shoulder width. Shoulders could be widened to a minimum of 6 feet, or 4 feet minimum in areas of physical constraints, to meet standards.

Photograph 4. Hemlock Street at Haystack Hill

Hemlock Street lacks sidewalks outside of commercial areas, requiring people to walk on the shoulder or use an alternative route. Alternative routes do not always exist, like at Haystack Hill, where Hemlock Street is the only through route and has narrow shoulders.

Public Transportation

Transit service and access is critical to ensure mobility for all people in the Cannon Beach community, especially because of the high portion of people living with disabilities and without access to a vehicle. Transit is necessary to connect residents with services and jobs available in other communities, like hospitals, supermarkets, and the schools in Seaside. Transit also reduces the need for residents and visitors to drive, thereby reducing the demands on the roads and parking in Cannon Beach. Given the high cost of housing in Cannon Beach, many employees are likely to commute in from locations other than Cannon Beach. Additionally, the large number of year-round tourists could be a potential market for transit on two fronts: one, through improved intercity transit service that could allow tourists to leave the cars at home, and two, more frequent service that could allow tourists to leave their cars at their lodging and use transit to travel within the city. Transit solutions will be explored further in subsequent phases of the project. Other considerations include:

- Transit service in Cannon Beach is limited to daytime hours, with few trips before 7 am or after 8pm. Longer service hours may make transit a more viable option for people to commute or travel without driving.
- The bus to Seaside runs hourly, and also ties into an hourly connector in Astoria. However, service to other cities is less frequent. The Pacific Connector travels five times per day between Astoria and Cannon Beach, and only on the weekends. The bus to Tillamook makes four trips per day. The POINT bus to Portland makes one trip per day. Infrequent service can make transit an infeasible option for residents or potential visitors. Tourists who arrive by transit do not burden the local street network with additional cars and the need for parking.
- Infrequent service to Portland inhibits using transit to travel between Cannon Beach and the Portland International Airport.

Freight

The economy based on tourism and the lack of manufacturing and intermodal shipping in Cannon Beach means the freight demands are relatively low. It will be important to consider continued movement of goods to support the community and economy, as well as to maintain delivery access while minimizing impacts to others on the road.

- Maintaining access to commercial areas and industrial areas will be important to consider while assessing potential transportation improvements.
- Delivery trucks require a place to park while delivering. There are currently few designated loading zones in commercial areas. Curb management and loading zones will need to be balanced with demand for parking.

FUNDING

The City of Cannon Beach manages a Road Fund to be used for the construction, maintenance and repair of streets and roads. Road Fund revenue comes from local taxes levied by the Cannon Beach Road District, the State gas tax, grants, and transfers from the general fund. The Road Fund covers costs related to personnel (wages and benefits), materials and services (equipment, tools, administration, and contracted services), debt service, and capital outlay (repairing existing assets or acquiring new assets).

The City also manages a Bridge Reserve Fund for future capital improvements for bridges. The Bridge Reserve Fund has maintained a balance of \$8,592 without revenue or expenses since the end of the 2016-2017 fiscal year.

The City collects System Development Charges (SDCs). These are one-time fees assessed on new use or on an increase in use of a property. For example, SDCs may be collected when someone develops a vacant property into a residence. According to State law, SDCs may only be used for capital improvements and cannot be used for maintenance or operations activities. Transportation SDCs are generally used by city governments to fund capital improvements from their TSPs or Capital Improvement Programs. The City's Road Fund does not currently collect revenues from SDCs.

Table 16 Summarizes total funds available from the Road Fund and Bridge Reserve Fund for the past five fiscal years, as reported in the [FYI 2020-2021 Adopted Budget](#).

Table 16. Road Fund Expenditure Summary (2016–2021)

	2017	2018	2019	2020 (Adopted)	2021 (Adopted)
Beginning Fund Balance	\$52,200	\$154,883	\$235,927	\$220,578	\$400,000
Revenues	\$877,515	\$924,805	\$792,768	\$931,577	\$575,364
Expenditures	\$774,832	\$843,761	\$697,135	1131577	\$975,364
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	\$29,170	\$8,592

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

APPENDIX A: TRAFFIC COUNTS

APPENDIX B: SYNCHRO AND SIMTRAFFIC REPORTS

APPENDIX C: PARKING UTILIZATION STUDY