

April 28, 2022



# YAQUINA HEAD Traffic Study



DRAFT



Prepared for:  
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Vancouver, WA



In coordination with:  
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Contract No. DTFH7015D00007

Task Order No. 69056721F000012



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- Appendix B: Existing and Projected Conditions Memorandum
- Appendix C: Alternatives Analysis
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## ABBREVIATIONS & ACRONYMS

<b>ADA</b>	Americans with Disabilities Act
<b>AFM</b>	Automated Fee Machine
<b>BLM</b>	Bureau of Land Management
<b>CATEX</b>	Categorical Exclusion
<b>DOI</b>	Department of the Interior
<b>EA</b>	Environmental Assessment
<b>EIS</b>	Environmental Impact Statement
<b>EPA</b>	Environmental Protection Agency
<b>FAST</b>	Fixing America's Surface Transportation Act
<b>FHWA</b>	Federal Highway Administration
<b>FLAP</b>	Federal Lands Access Program
<b>FLTP</b>	Federal Lands Transportation Program
<b>FLMA</b>	Federal Land Management Agency
<b>FONSI</b>	Finding of No Significant Impact
<b>FOYL</b>	Friends of Yaquina Lighthouses
<b>IIJA</b>	Infrastructure Investment and Jobs Act
<b>mph</b>	miles per hour
<b>MUTCD</b>	Manual on Uniform Traffic Control Devices
<b>NEPA</b>	National Environmental Policy Act
<b>NHPA</b>	National Historic Preservation Act
<b>NPS</b>	National Park Service
<b>NRHP</b>	National Register of Historic Places
<b>OC</b>	Oversight Committee
<b>OCT</b>	Oregon Coast Trail
<b>ODOT</b>	Oregon Department of Transportation
<b>ONA</b>	Outstanding Natural Area
<b>PIP</b>	Public Involvement Plan
<b>RPA</b>	Robert Peccia and Associates
<b>SHPO</b>	State Historic Preservation Officer
<b>SUP</b>	Shared Use Path
<b>THPO</b>	Tribal Historic Preservation Officer
<b>TSP</b>	Transportation System Plan
<b>USC</b>	United States Code
<b>USFS</b>	United States Forest Service
<b>USFWS</b>	United States Fish and Wildlife Service
<b>WFL</b>	Western Federal Lands



# ACKNOWLEDGMENTS

The following individuals provided guidance and support throughout the course of this study.

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## CONSULTANT TEAM

This study was conducted by consulting firm Robert Peccia and Associates (RPA). The following team members contributed to the study.

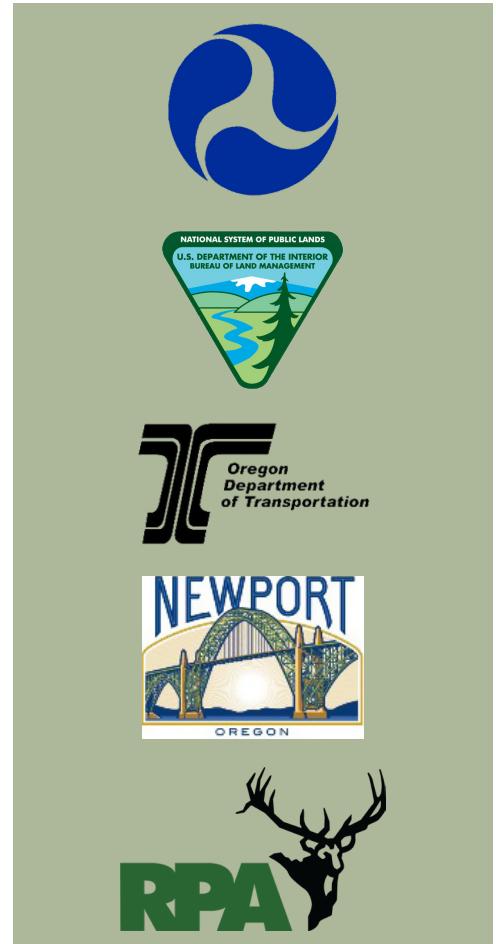
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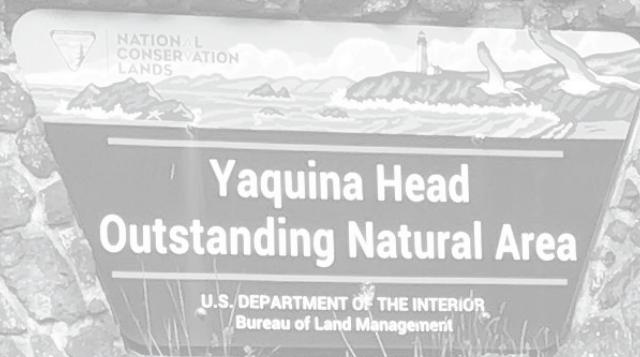
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## Traffic Study



Source: BLM

# Chapter 1: Introduction

*The Federal Highway Administration (FHWA) Western Federal Lands Highway Division (WFL) and the Bureau of Land Management (BLM) conducted the Yaquina Head Traffic Study to evaluate the Yaquina Head Outstanding Natural Area (ONA) and identify improvements to address site needs while considering public and stakeholder input, environmental constraints, constructability challenges, and financial feasibility.*

*Understanding the history and recreational opportunities at the site helps provide context for determining needs and potential improvements*



# YAQUINA HEAD

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### 1.1. STUDY AREA

Yaquina Head ONA is a 100-acre protected area managed by the BLM and officially designated by the United States Congress to provide for the conservation and development of the scenic, natural, and historic values of the area; the continued use of the area for education, scientific study, and public recreation; and protection of the wildlife habitat of the area.

Yaquina Head ONA is located on the central coast of Oregon at the north end of the City of Newport in Lincoln County. The ONA is located on a headland extending nearly one mile into the Pacific Ocean. At the point of the basalt headland is the Yaquina Head Lighthouse, Oregon's tallest lighthouse.

The ONA is accessible via Lighthouse Drive which is a one-mile-long, two-lane road that begins at the intersection with the Oregon Coast Highway (US Highway 101 [US 101]) at mile post 137.61. The ONA boundary begins about 0.2 mile west of the intersection. **Figure 1** presents the Yaquina Head ONA study area. The ONA site serves as the primary focus area for this study, although parking facilities and multimodal corridors outside the Yaquina Head ONA boundary are also considered in the context of connectivity and access for ONA visitors.

### 1.2. SITE HISTORY

The Yaquina Head Lighthouse (originally called the Cape Foulweather Light at Yaquina Point) was built in 1872. It is just one in a string of lighthouses strategically planned along the Pacific Coast by the US Lighthouse Service to allow mariners to sail the rocky coastline after dark.

In the early days, the area was wilderness with limited access to the lighthouse. The US Lighthouse Service extended a rough wagon road to bring supplies from the docks at Newport to the light station at Yaquina Head traveling partially along Agate Beach. Construction materials and supplies were mainly delivered to the small cove just south of the headland, where workers hauled them up the bluff, eventually using a tramway built in 1885 at present-day Cobble Beach. Along with the construction of the lighthouse and its associated oil house, a large dwelling for two keepers and their families was built east of the lighthouse tower. Other structures included a smaller keeper's dwelling, barn, water tank, cisterns, and a workshop. Keepers and their families raised livestock and tended a kitchen garden to supply herbs, fruits, and vegetables. As the wagon road gradually improved, early automobiles brought increasing numbers of visitors to the lighthouse and reduced the need for the keepers to tend a garden and raise livestock.



FIGURE 1: STUDY AREA

In 1966, a computer was installed at Yaquina Head Lighthouse and a resident keeper was no longer needed on the grounds. The unoccupied keeper's quarters eventually fell into disrepair and were eventually removed in 1984. Today, only the lighthouse, oil house, water tank, and garden remain at the site.<sup>1</sup>

Between 1917 and 1983, quarrying activity removed huge amounts of basalt rock from Yaquina Head, carving out present-day Quarry Cove and the site of the Interpretive Center. Basalt rock from the quarries was crushed into gravel and used for various road construction projects, including US 101. In the 1970s, nearby residents expressed concerns about the impacts of the quarry activity, including the changing shape of the headland.<sup>2</sup> On March 5, 1980, US Congress designated about 100 acres of Yaquina Head as an Outstanding Natural Area to protect the unique scenic, scientific, educational, and recreational values of the lands. BLM now acts as caretaker for the site, conserving and protecting its natural values for all to enjoy. Ongoing efforts are focused on eliminating non-native vegetation and reintroducing native plants to improve habitat for wildlife and preserve the cultural landscape. Yaquina Head ONA also offers space to conduct research, collect data, and house monitoring equipment for many areas of science including geology, paleontology, biology, marine biology, archaeology, history, and social science.<sup>3</sup>

## 1.3. RECREATIONAL OPPORTUNITIES

Yaquina Head ONA provides multiple recreation opportunities including seal, sea bird, and wildlife viewing; whale watching; tide pooling; and numerous walking and biking trails. The offshore islands provide a year-round refuge for harbor seals and a spring-summer home for thousands of nesting seabirds. Gray whales can be spotted during their annual migrations to Mexico (during late fall-early winter) and Alaska (during late winter-early spring). During the summer months some gray whales feed in the shallow waters around the headland. Cobble Beach, named for the smooth, dark, rounded basalt stones that cover the beach, offers some of the best tidepool exploration in the area. When the tide is low, a vibrant ocean floor is revealed with pools of colorful animals including orange sea stars, purple sea urchins, and giant green anemones.



Source: Rudy W. Tschernich

This 1975 photo shows the upper level of the Yaquina Head quarry where the present day Interpretive Center is located.

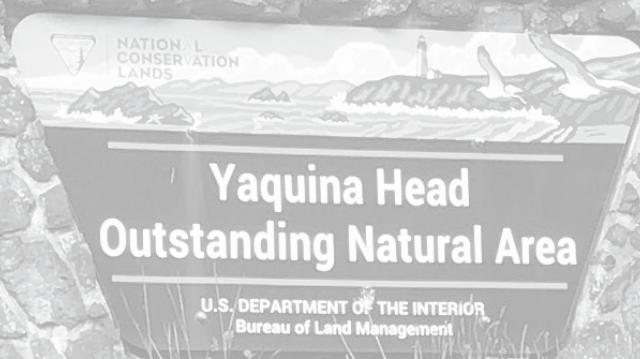
For a brief time, Quarry Cove provided access to the nation's only wheelchair-accessible tidepools. However, the ocean continually deposited sand in the pools, so the BLM decided to instead maintain Quarry Cove as an *Americans with Disabilities Act (ADA)*-accessible beach.

Many local residents regularly walk their dogs at the site. Leashed dogs are allowed on all trails and beaches but are not allowed inside the Interpretive Center or lighthouse. Walking, hiking, and biking are popular for both locals and out-of-area visitors to enjoy stunning views of the Oregon coast.

Other users visit Yaquina Head ONA to surf or hang/paraglide. Communications Hill Trail provides access to 2 hang/paragliding launch sites. Pilots are instructed to check in with ONA staff prior to flying as there is at least one closure or restriction in force at all times. There are also several good viewpoints to watch these recreationists.

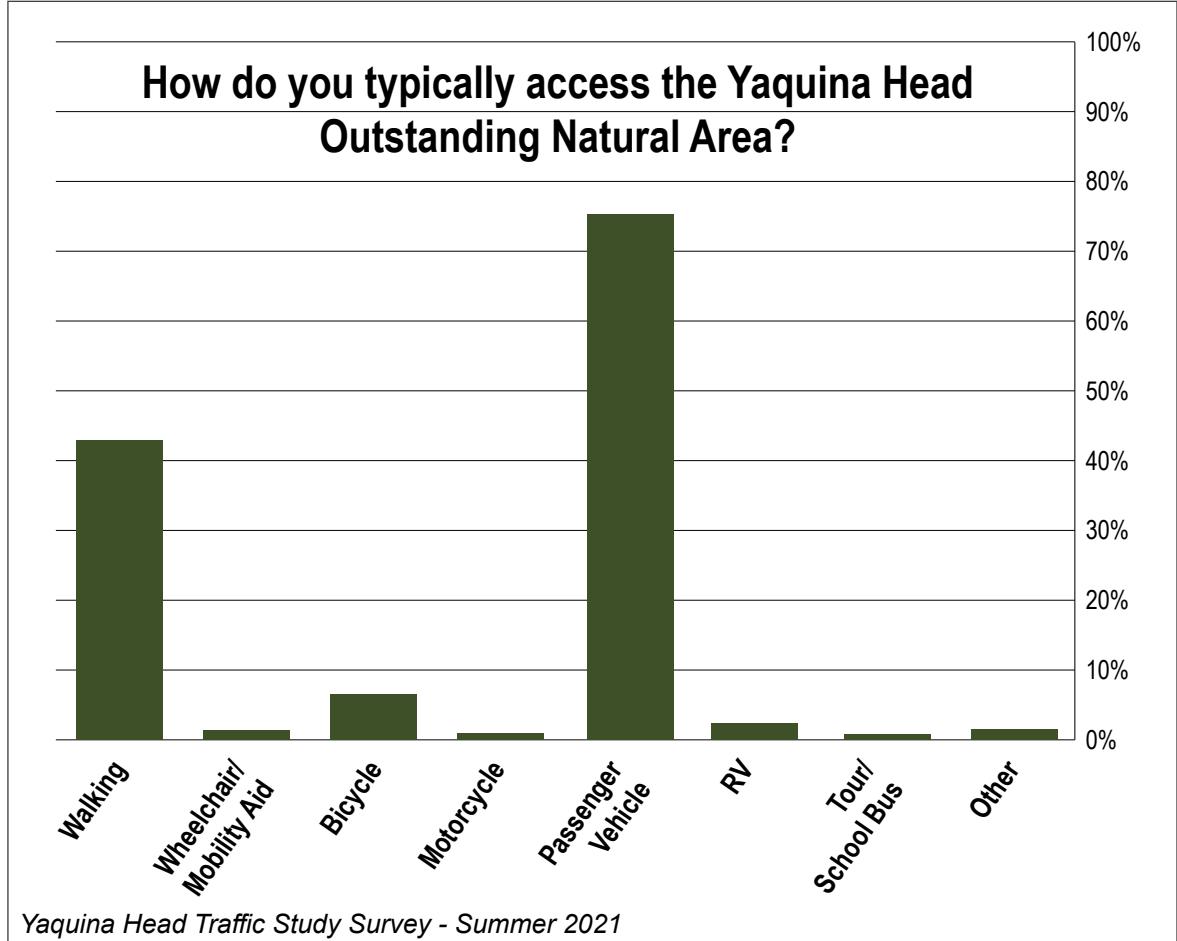
Guests are encouraged to visit the Interpretive Center to view exhibits, presentations, and videos on seabirds and marine life as well as human history on the headland. The center also features the wheelhouse of an historic ship, a recreated rocky island and its inhabitants, and a full-scale replica of the lighthouse lantern. For many years, peregrine falcons have built nests on the cliffs above the Interpretive Center. Visitors often congregate in the Interpretive Center parking lot to watch the falcons.

BLM staff and volunteers are available for visitors to ask questions. When weather and staffing conditions permit, ranger-led lighthouse tours are also offered.



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Yaquina Head Traffic Study Survey - Summer 2021

## Chapter 2: Outreach and Public Involvement

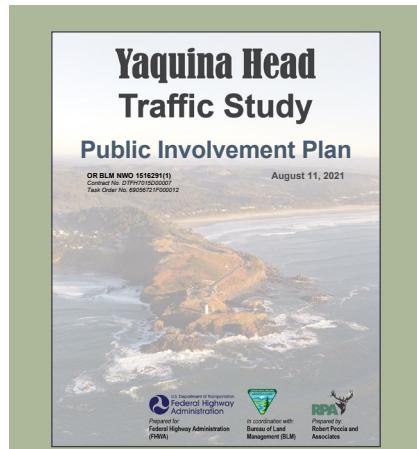
*Education and public outreach are essential parts of fulfilling the responsibility to inform the public about the study process. Public involvement is critical to ensure the study reflects visitor and local community needs, issues, and values. Comments from the public foster cooperation and help BLM staff and local officials make informed decisions.*



# YAQUINA HEAD Traffic Study

## 2.1. PUBLIC INVOLVEMENT PLAN

A *Public Involvement Plan* (PIP) was developed early in the study process to guide public participant opportunities throughout the study. The PIP outlined key audiences and proposed public participation strategies and opportunities for engagement with members of the public and stakeholders. The goal of the PIP was to facilitate ongoing public engagement throughout the study process to ensure the needs and concerns of all Yaquina Head ONA site users were appropriately identified and addressed. Using the PIP as a starting point, engagement activities were tailored over the course of the study in response to site, staffing, participant, and health and safety considerations. Specific public outreach activities that were conducted are noted in this chapter. Materials, such as press releases, advertisements, informational sheets, flyers, newsletters, and the survey summary are provided in **Appendix A**.



## 2.2. ONGOING PUBLIC ENGAGEMENT

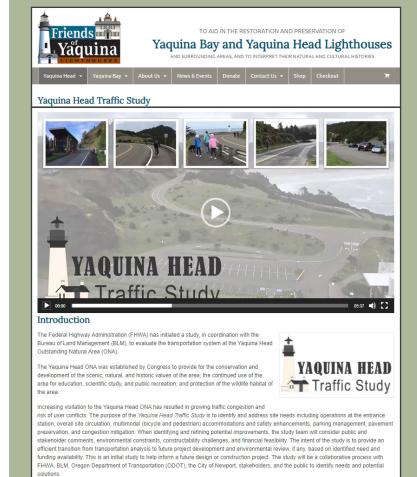
Multiple involvement opportunities enabled participants to engage in the study process at their convenience. Key audiences included state and local officials, stakeholder organizations, and the public.

### EMAIL CONTACT LIST

The study email contact list included individuals, organizations, or other groups with knowledge and interest in the study area as well as individuals who attended public meetings or signed up for the email list. Emails were sent to notify study contacts of key milestones during study development.

### STUDY WEBSITE

A website (<https://www.yaquinalights.org/yaquina-head-traffic-study/>) was developed to encourage public interaction and to provide information. The website was hosted by Friends of Yaquina Lighthouses (FOYL) and contained contact information, an overview of the study purpose, study announcements, newsletters, maps, and study documents. The planning team updated the website throughout the study process as new information and materials became available.



Yaquina Head Traffic Study  
website homepage

## 2.3. TARGETED OUTREACH

Targeted outreach activities were scheduled to share important study information, obtain meaningful input and dialogue about the study process, and to identify important considerations for potential improvements. The following outreach activities were conducted to interact with the study oversight committee (OC), stakeholders, and the public.

### 2.3.1. *Oversight Committee (OC)*

A study OC was established with representatives from FHWA, BLM, Oregon Department of Transportation (ODOT), and the City of Newport. The OC met throughout the course of the study to discuss progress, review materials, and provide feedback. The committee provided guidance to the consulting team and reviewed study documentation before publication.



### 2.3.2. Public Outreach

Public outreach activities were conducted at key points during the planning study. The first outreach effort occurred during the initial evaluation of existing and projected conditions. The second outreach coincided with the release of the *Existing and Projected Conditions Memorandum*, and the third outreach event was conducted in tandem with release of the draft *Yaquina Head Traffic Study*.

#### PUBLIC OUTREACH #1 – SUMMER 2021

The first public outreach effort took place between August 13 and September 10, 2021, and consisted of a public survey and launch of the study website. The purpose of this initial outreach effort was to explain the study process and gather information from the public and stakeholders to identify issues and concerns relating to the site. The effort allowed members of the public to learn about the study and provide feedback about transportation-related issues and concerns.

Members of the consultant team, BLM, and FHWA were onsite at the ONA to kick off the outreach effort and boost participation in the survey. Team members set up a booth at the ONA on August 13<sup>th</sup> with tablets available for the public to take the survey. The team was also available to answer questions about the study. Before the site opened in the morning, the team was stationed at the entrance station to catch neighborhood residents walking into the site outside of normal operating hours. In the late morning/early afternoon, the team was stationed at the lighthouse.

Several methods, including print and electronic formats developed in both English and Spanish, were used to notify the public and stakeholders of the survey and website and to promote overall engagement. The website contained links to the survey in both English and Spanish, a brief video explaining the study process, and the study newsletter. An email update was sent to the study contact list announcing the study, survey, and website. Flyers were posted around the site and handed out to public venues in Newport (including the library, post office, recreation center, and local businesses). Newsletters explaining the study process and announcing the survey were available at the Interpretive Center gift shop. Small handouts with a QR code directing visitors to the survey were given to BLM staff to provide to visitors throughout the survey duration. A news release was also shared with local media outlets.

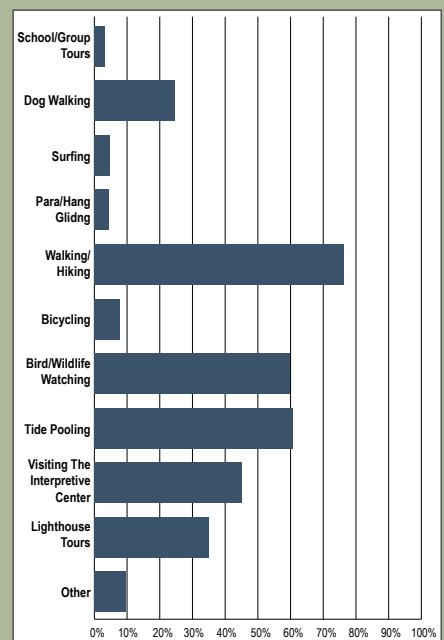
The survey was an opportunity for visitors to share concerns and ideas regarding transportation at Yaquina Head ONA to help the team identify areas of focus for the study. A total of 251 respondents participated in the survey.

#### PUBLIC OUTREACH #2 – WINTER 2022

The second public outreach effort occurred in February 2022 corresponding with release of the *Existing and Projected Conditions Memorandum*. Outreach activities included updated website content, posts on the FOYL social media accounts, and an email to the study contact list announcing availability of the report. A summary of key findings from the analyses contained in the report was also provided.



Flyer for public outreach #1 posted at the site and around Newport



Survey results from August 2021: Which activities have you participated in during visits to the ONA?



Social media post on FOYL Facebook page



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### PUBLIC OUTREACH #3 – SPRING 2022

The third public outreach effort will take place in the spring of 2022 and will correspond with release of the draft *Yaquina Head Traffic Study*.

#### SHARE YOUR INPUT!

The Federal Highway Administration (FHWA) and the Bureau of Land Management (BLM) invite you to share your feedback regarding transportation improvements at the Yaquina Head Outstanding Natural Area.

La Administración Federal de Carreteras (FHWA) y la Oficina de Administración de Tierras (BLM) te invitan a compartir tu opinión sobre las mejoras de transporte en el Área Natural Destacada de Yaquina Head.

— Please see reverse for details —

— Consulta el reverso para más detalles —



For more information or to submit comments:  
Para obtener más información o enviar comentarios:

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The draft Yaquina Head Traffic Study is now available for public review!  
¡El proyecto de Estudio de Tráfico de Yaquina Head ya está disponible para su consulta pública!



SCAN TO REVIEW  
ESCANEAR PARA REVISAR



Postcard mailers were sent to the properties neighboring Yaquina Head ONA to announce the release of the draft traffic study and opportunity for public and stakeholder comment.



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## 2.4. PUBLIC AND STAKEHOLDER FEEDBACK

Public and stakeholder comments were collected and considered throughout the study process. A public survey was conducted to understand public priorities, needs, and visiting characteristics. Common themes relating to primary topics of interest are summarized in this section. A summary of comments received over the course of the study is provided in **Appendix A**.

### ENTRANCE STATION



Visitors and staff are frustrated with the congestion at the entrance. To help alleviate congestion during peak periods, staff stand in traffic to conduct “line busting” which involves standing in live traffic between traffic cones and directing pass holders to proceed to the left side of the booth through one of the lanes typically used for outbound traffic. An extra lane would be helpful to allow pass users, deliveries, and staff to bypass visitor lines or expedite visitor processing time. A reservation system, especially during peak periods, could also be helpful. Hours and fees should be posted near the US 101 intersection, and a turn-around opportunity should be provided before the fee booth.

### PARKING (GENERAL)

The use of RV/bus and ADA parking spaces should be better enforced, and more of each type of parking stall is desired. Additional offsite parking may be beneficial to encourage walking/biking into the site. Electric vehicle/bicycle charging stations could also be helpful. Parking by Communications Hill is useful for hang/paragliders.



## VEHICLES



Minimizing vehicle access is desirable to some visitors. Consideration of noise and pollution impacts of vehicles is a concern. Improvements should be sensitive to traffic fluctuations throughout the year, not just addressing peak periods.

## PEDESTRIANS



Better accessibility for disabled individuals is desired. Sidewalks or separated paths along Lighthouse Drive (from US 101 intersection and ONA entrance) are also desired. Improved visibility at crosswalks would be beneficial, especially near the Keeper's Garden. Providing walking distances on maps may help promote walking.

## SAFETY



Speed enforcement is desirable and speed bumps were suggested to help slow vehicles. Lowering the speed limit through the site and providing speed feedback signs may also help reduce speeds. Providing physical separation of vehicles from pedestrians and bicyclists may help increase user comfort and safety. There are active landslides within the site, especially near the entrance station. Visitor safety is a concern in a landslide event.

## LIGHTHOUSE PARKING AVAILABILITY



Visitors expressed frustrations regarding the cones forcing vehicles into the Interpretive Center lot, especially when the lighthouse lot was not full. A display of the number of open spots at the lighthouse could be helpful, or at least a sign indicating that the lighthouse lot is full. Better indication of distances/walking options at the Interpretive Center would help promote more walking to the lighthouse. Consider potentially limiting parking/driving to the lighthouse to disabled individuals and tour groups.

## MULTIMODAL OPTIONS



A shuttle is desired by some to limit vehicle use at the site. BLM could consider coordinating with other Oregon Coast recreation sites. Additional trails are also desired. Bike access from US 101 is perceived as unsafe. Improving public transportation to the site is desirable.



## EMERGENCY RESPONSE

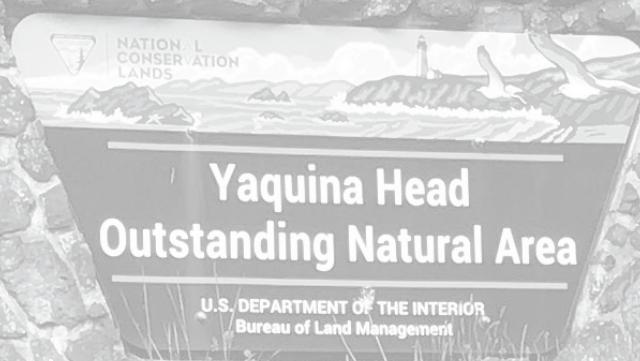
Consideration of how improvements would function during emergencies is important. Improvements should address emergency transportation issues both for small-scale and large-scale emergencies, such as fire, earthquake, or tsunami. A threshold of maximum capacity should be considered to allow safe evacuation in the event of an emergency.



## OTHER

Other general comments that were received throughout the planning process are summarized below.

- Access for hang gliders and paragliders is very appreciated.
- The rangers are extremely helpful and friendly, and communicating with them enhances the visitor experience.
- Drone use at the site is not desirable.
- Road improvements/maintenance on Lighthouse Drive are needed.
- Closing at sunset makes it difficult for visitors to obtain sunset photos.
- Protecting the environment is important to visitors.
- Moving the gates before the fee station could help with management of the site during off hours.
- Theft has occurred in the past and increased security of the site is desirable.



# YAQUINA HEAD

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# Chapter 3: Transportation System

*The study evaluated the existing transportation system to establish the current traffic conditions and to identify areas of concern. The following analysis of transportation conditions includes an examination of existing traffic data, vehicle crash history, field observations, pavement conditions, aerial imagery, and geographic information system data. Existing data were provided by ODOT, and additional traffic data were collected by RPA in 2021. The available information supplemented with the collected data were used to establish the existing transportation characteristics and conditions. Appendix B provides additional details about existing and projected transportation conditions within the study area*



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### 3.1. PHYSICAL FEATURES AND OPERATIONAL CHARACTERISTICS

Lighthouse Drive serves multiple residential and commercial areas and provides access to Yaquina Head ONA. The following sections discuss physical features and operational characteristics of the roadway and adjacent parking areas and multimodal corridors.

#### 3.1.1. Roadway Surface and Width

The entirety of Lighthouse Drive is paved from the US 101 intersection to the lighthouse parking lot. From the US 101/Lighthouse Drive intersection to the Yaquina Head ONA entrance gate, the widths on Lighthouse Drive are generally 21 feet with minimal shoulders. Past the entrance gate, the widths on Lighthouse Drive vary from 24 feet to 35.5 feet in width with 1.5-foot to 6-foot shoulders. The widest stretch of roadway occurs just beyond the entrance gate. The narrowest section of roadway within Yaquina Head ONA is 12 feet and occurs on the Quarry Cove access road beyond the upper parking lot.

#### 3.1.2. Intersecting Facilities and Traffic Control

Based on field review and aerial photography, 10 intersecting vehicular facilities occur along Lighthouse Drive, including a variety of public roadways, private approaches, recreational accesses, and parking areas. Outside the Yaquina Head ONA, existing traffic control on Lighthouse Drive consists of a traffic signal at the US 101/Lighthouse Drive intersection and stop signs on some approach roadways including NW Agate Way, the Hill Buffet and Grill driveway, and NW Rocky Way to the north. Within the Yaquina Head ONA, stop signs are placed on the Quarry Cove and Interpretive Center access roadways.



The US 101/Lighthouse Drive intersection is signalized; all other intersecting roadways are stop controlled.

#### 3.1.3. Traffic Circulation and Parking

Within the Yaquina Head ONA, vehicular traffic uses Lighthouse Drive to enter the site and to reach key destinations. Additionally, the Quarry Cove roadway provides access to the upper and lower parking areas at Quarry Cove. Several parking opportunities are available both within the site and the surrounding area to serve visitors. The total number of parking stalls provided in each lot is summarized in **Table 1** at the end of this section. **Figure 2** provides a map showing the locations of the available parking areas. Stakeholders have noted a desire for additional large vehicle and ADA parking stalls within the Yaquina Head ONA.

#### ENTRANCE STATION CIRCULATION

After entering the Yaquina Head ONA site, visitors proceed to the entrance station where they are greeted by a ranger and either pay an entrance fee or present a valid pass. For credit card purchases, visitors are directed to an automated fee machine (AFM) kiosk located just to the west of the main booth.

During peak visitation periods, a traffic queue extends along Lighthouse Drive and sometimes reaches back to the US 101 intersection, according to BLM staff.<sup>4</sup> To expedite visitor processing during these times, BLM staff conduct what is called “line busting” which involves standing in live traffic between traffic cones and directing pass holders to proceed to the left side of the booth through one of the lanes typically used for outbound traffic. This can create a conflict with pedestrians walking from the AFM kiosk back to the booth to pick up a pass from the ranger.

Occasionally, drivers decide not to proceed into Yaquina Head ONA and attempt to turn around before the entrance station. These maneuvers are generally not safely accommodated by the existing traffic control and entrance configuration.



During periods of peak visitation, traffic queues at the entrance station have extended to the US 101 intersection.

## QUARRY COVE CIRCULATION AND PARKING

The Quarry Cove access road is a single-lane, one-way couplet serving vehicles entering and exiting the Quarry Cove recreational area. A pullout is provided on the south side of the couplet that is used for parking. In addition, 2 separate paved parking lots are available for visitor use off the Quarry Cove access road. The northern parking lot, referred to as the upper lot, consists of 12 angled parking stalls, 3 perpendicular parking stalls, 2 ADA-compliant stalls, and 3 large vehicle parking stalls. Restroom facilities are provided as well as dedicated crosswalks with access to and from the upper and lower Quarry Cove Trails. The configuration of this lot is confusing and lacks clear direction for vehicle circulation. One-way signs appear to point in opposing directions, and some personal vehicles were observed circulating through areas striped as large vehicle parking stalls. Additionally, BLM staff have reported that visitors sometimes cross the solid yellow line into the oncoming lane to reach the gated ADA access roadway.

An additional lot, referred to as the lower lot, is located on the southern side of the Quarry Cove access road. This lot contains 31 perpendicular parking stalls and 2 ADA parking spots. A small turnaround area is provided at the eastern end of the lot. This lot generally does not accommodate large vehicles due to its narrow configuration.



*The Quarry Cove parking lot consists of two levels; upper (pictured) and lower. The circulation pattern of the lot can be confusing to visitors.*

## INTERPRETIVE CENTER CIRCULATION AND PARKING

The Interpretive Center parking lot is a popular parking area for visitors. It offers 126 perpendicular parking stalls, 4 of which are designated for Official Vehicles Only. The lot also provides 6 angled stalls and 8 ADA stalls. A lane designated for large vehicle parking is provided parallel to the parking lot entrance lane, and some drivers confuse the parking lane for a circulation route. The lane provides space for approximately 3 large vehicles. BLM staff have indicated that RVs sometimes park in the angled stalls near the maintenance building as well as in undesignated areas along the perimeter of the lot during busy times.

When the Interpretive Center is open, BLM uses traffic cones to channel westbound vehicles from Lighthouse Drive into the Interpretive Center parking lot. This configuration is used to circulate visitors through the Interpretive Center lot in the hope that visitors will park and walk down to the lighthouse rather than driving. Once inside the Interpretive Center lot, the intended circulation pattern directs visitors around the outside edge of the lot in the counterclockwise direction. Visitors often express frustration with the cones and sometimes perform unsafe maneuvers to avoid circulating or parking in the Interpretive Center lot. Some drivers have been observed swerving around the cones to continue on Lighthouse Drive, while other drivers enter the parking lot and immediately make a U-turn in order to leave the lot and continue west on Lighthouse drive. These maneuvers result in increased potential for user conflicts within the parking area and on Lighthouse Drive.



*When the Interpretive Center is open, BLM staff set out cones forcing visitors into the Interpretive Center parking lot. The cones are sometimes bypassed and can be confusing to visitors.*

A small pet relief area is provided northeast of the parking lot with a short loop trail/mowed corridor. Pedestrian access to the lighthouse is provided from this lot via the Lighthouse Trail which wraps around the Interpretive Center, crosses under Lighthouse Drive, and continues along the south edge of Lighthouse Drive. Some visitors were observed walking from the parking lot to the intersection with Lighthouse Drive and then continuing west along Lighthouse Drive, despite the lack of dedicated pedestrian facilities on this route.

## LIGHTHOUSE CIRCLE CIRCULATION AND PARKING

The lighthouse parking area is a one-way loop with angled parking around the outside edge. Access to the Yaquina Head lighthouse and Cobble Beach are provided on the western edge of this lot. A small area with additional parking is also provided off the east side of the parking lot, providing direct access to Salal Hill Trail, restroom facilities, and a small maintenance building.



# YAQUINA HEAD

## Traffic Study

In total, the lot provides 26 angled parking stalls, 11 perpendicular stalls, 3 designated ADA stalls, 2 stalls for Official Vehicles Only, and 3 stalls designated for large vehicle parking. Sidewalk is provided along the outside edge of the parking lot, however, pedestrians are often observed walking across the center island and within the vehicle travel lanes as a shortcut to reach their desired destination.



*The RV stalls in the lighthouse parking lot are sometimes occupied by personal vehicles.*

### ERNEST BLOCH MEMORIAL WAYSIDE PARKING

The Ernest Bloch Memorial Wayside parking area is located adjacent to US 101 and is accessed from NW Gilbert Way. The lot offers 65 perpendicular parking stalls, 3 large vehicle stalls, and 3 designated ADA stalls. A crosswalk is provided across NW Gilbert Way allowing access from adjoining sidewalks next to the parking area. Some visitors choose to park in this area and walk into the Yaquina Head ONA, despite the lack of designated pedestrian facilities between US 101 and the Yaquina Head ONA site.

### INFORMAL PARKING

Several informal parking areas are located within the site, including along the Quarry Cove access road and on Lighthouse Drive. A small parking area exists approximately 130 feet west of the US 101/Lighthouse Drive intersection that offers 11 parking stalls and allows visitors to walk down to the beach or to Yaquina Head ONA. The pullouts on Lighthouse Drive within the ONA are often used by visitors for parking, although BLM staff indicated these pullouts are provided as short-term viewpoints and are not intended for long-term parking purposes. Staff also noted concerns about visitors attempting to park in these pullouts with the end of their vehicles partially in the roadway. Some visitors, especially hang/paragliders, also park in the widened area at the base of Communications Hill.



*The Ernest Bloch Memorial Wayside parking lot is located approximately in the southwest quadrant of the US 101/Lighthouse Drive intersection.*



*A few small pullouts are located on Lighthouse Drive. The pullouts are intended to be for short-term photo opportunities but are often used for longer-term parking.*

**TABLE 1: AVAILABLE PARKING**

Parking Lot	Perpendicular Stalls	Angled Stalls	ADA Stalls	Large Vehicle Stalls	Official Vehicles Only Stalls	Total Stalls
Quarry Cove (Upper)	12	3	2	3	--	20
Quarry Cove (Lower)	31	--	2	--	--	33
Interpretive Center	122	6	8	~3	4	143
Lighthouse Circle	11	26	3	2	3	45
Ernest Bloch Memorial Wayside	65	--	3	3	--	71
Informal Parking*	--	11	--	--	--	11
<b>Total Stalls</b>	<b>241</b>	<b>46</b>	<b>18</b>	<b>11</b>	<b>7</b>	<b>323</b>

\*Only marked parking stalls are included.

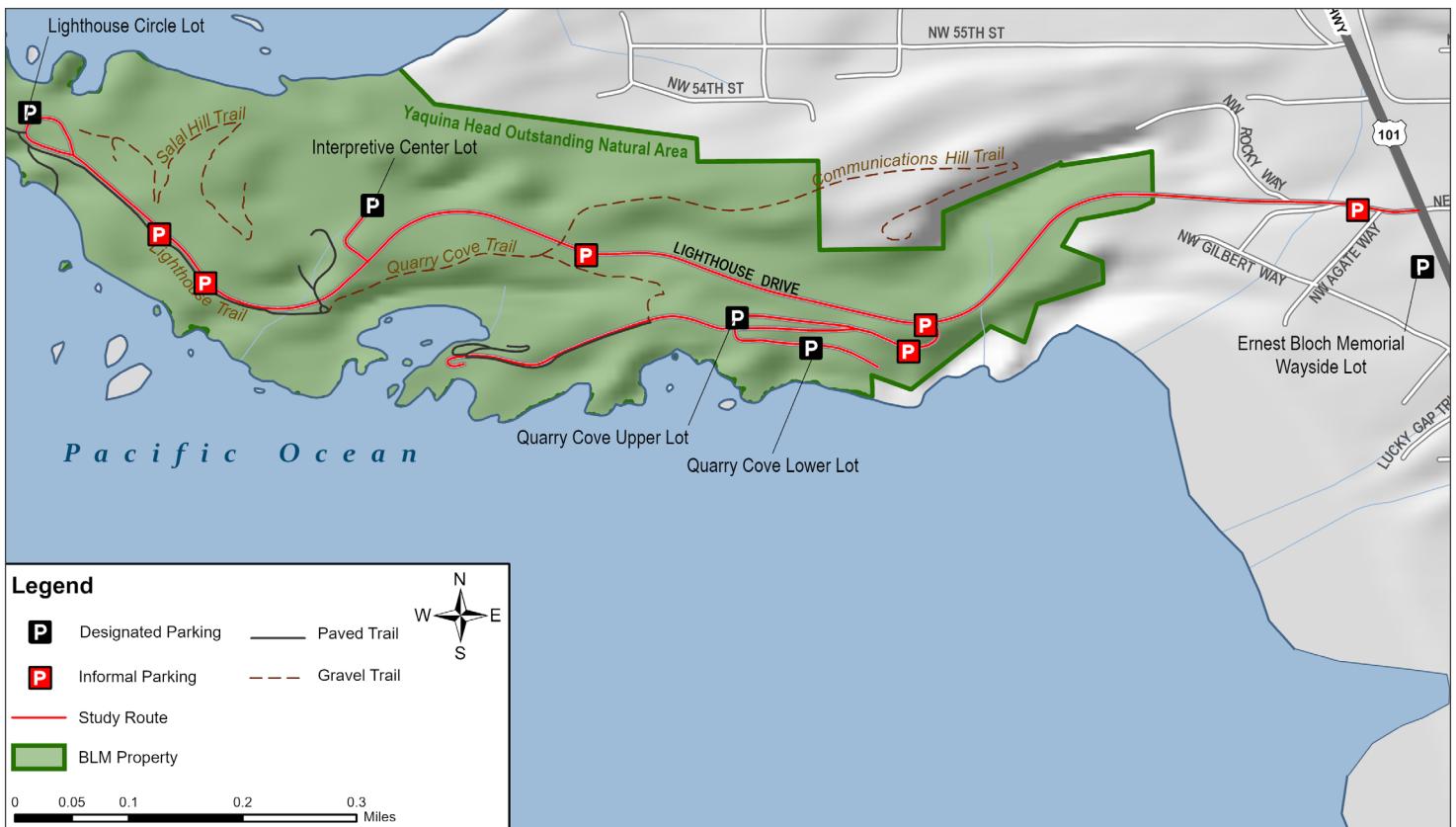


FIGURE 2: PARKING

### 3.1.4. Utilities

Several utilities are located within the Lighthouse Drive corridor including underground telephone, gas, power, water, and sanitary sewer. The utilities are generally located along the roadway centerline with meters located sporadically along the corridor on both sides of the roadway. Overhead power and telephone lines also cross Lighthouse Drive about 400 feet west of the US 101/Lighthouse Drive intersection.

The US Coast Guard maintains the facilities at the top of Communications Hill. The site includes communications equipment for aircraft, a cell phone tower, and research equipment for Oregon State University. Vehicular access to Communications Hill will need to be maintained so these facilities can be properly serviced.

An AFM is located at the entrance gate outside of the fee booth and is used to collect credit card payments. Electrical utilities including a high voltage switch pad, telephone utilities, and a meter are located at the entrance station. Additionally, the entrance booth includes a staff restroom served by water and sanitary sewer utilities.

### 3.1.5. Bridges and Culverts

Three intermittent unnamed streams cross Lighthouse Drive. The first stream crosses Lighthouse Drive approximately 250 feet west of the US 101 intersection. The second stream crosses Lighthouse Drive at the entrance station. The third stream crosses Lighthouse Drive near the Interpretive Center. No drainage features for these streams were identified based on available as-builts and field survey.



Utilities are provided near the entrance station for the AFM.

One culvert was identified on Lighthouse Drive during field investigations. The culvert was located approximately 200 feet west of the Quarry Cove entrance roadway. A few drainage culverts are also located near the Interpretive Center in the vicinity of Lighthouse Trail. Supplemental review of available as-built drawings confirms no other hydraulic features within the Yaquina Head ONA boundary.

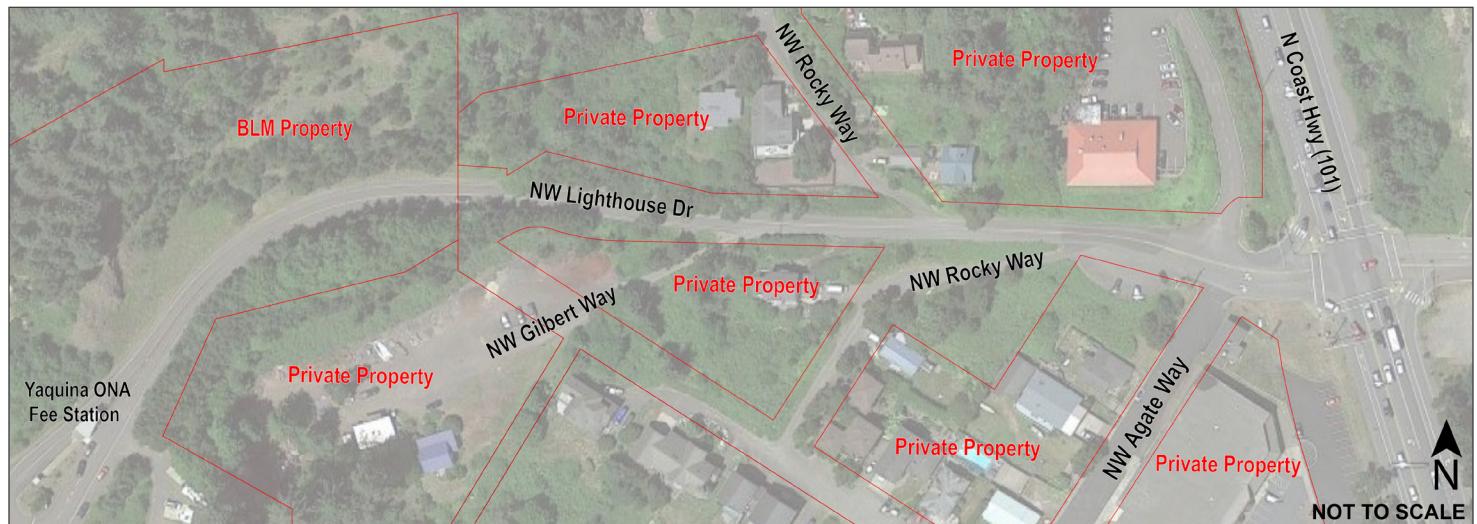


# YAQUINA HEAD

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### 3.1.6. Right-of-Way

BLM recently performed a boundary retrace to confirm their property boundary. The BLM right-of-way boundary occurs approximately 0.2 mile west of the US 101/Lighthouse Drive intersection. As seen in **Figure 3**, the BLM right-of-way is fairly wide with the exception of a pinch point just before the entrance station, where there is approximately 15 feet between the BLM boundary and the edge of the existing pavement. The northern BLM boundary borders the adjacent subdivisions. A city-owned water tank is also located just north of the BLM boundary and there has been discussion from the city about possibly moving the water tank or replacing it with a pump.



**FIGURE 3: RIGHT-OF-WAY MAP**

### 3.1.7. Maintenance Responsibility, Activities, and Vulnerabilities

ODOT is responsible for maintenance of US 101 and the Ernest Bloch Memorial Wayside parking area. The City of Newport is responsible for maintenance of Lighthouse Drive west of the US 101 intersection to the Yaquina Head ONA boundary. BLM is responsible for maintenance of Lighthouse Drive beginning at the Yaquina Head ONA boundary as well as all trails, parking areas, and buildings within the Yaquina Head ONA boundary.



BLM uses crack sealing techniques to repair cracks in the pavement at the ONA.

Historical asphalt maintenance records were provided by Yaquina Head ONA staff. The records include contract work dating back to 1998 and more recent maintenance work completed internally by BLM facilities staff. Records show that BLM staff conducts periodic maintenance including application of slurry seal, striping, and crack sealing.

Several locations along the Lighthouse Drive corridor have experienced pavement failures including transverse and longitudinal cracking and sloughing. The cause of these failures is typically a weakened or deteriorating subgrade. This distress on the pavement can be caused by a variety of factors including poor drainage, erosion, frost heave, lack of compaction, or weak materials. BLM staff noted an ongoing issue with sloughing on the Quarry Cove access road, which was previously filled and patched but continues to deteriorate.

### 3.1.8. Alternative Transportation Facilities and Services

#### PEDESTRIAN AND BICYCLES

Multiple pedestrian and bicycle opportunities are provided at Yaquina Head ONA. Visitors entering the site on foot or by bike do not have to pay amenity fees. Once inside the ONA, pedestrian trails range in difficulty and surface type. Bicycles are only allowed on paved areas of the site and on the Communications Hill Trail. **Table 2** summarizes trails at Yaquina Head ONA, and **Figure 4** displays them graphically.

**TABLE 2: YAQUINA HEAD ONA PEDESTRIAN AND BICYCLE TRAILS**

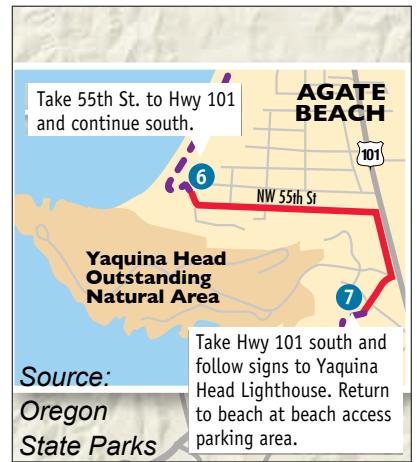
Trail Name	Rating	Walking Time	Steepest Grade	Surface Type	Bicycles Allowed?	Wheelchair Accessible?	Notes
Quarry Cove Trail (Lower)	--	--	--	Paved	--	Yes	<ul style="list-style-type: none"> <li>Access to Quarry Cove ADA Beach</li> <li>Disabled users can drive down to beach</li> </ul>
Quarry Cove Trail (Upper)	Most Difficult	10 minutes each way (to Interpretive Center)	33%	Gravel	No	No	<ul style="list-style-type: none"> <li>Steep concrete stairs</li> <li>Connection to Communications Hill and Lighthouse Trails</li> </ul>
Lighthouse Trail	Most Difficult	10 minutes each way (to Interpretive Center)	8%	Asphalt	No	Yes	<ul style="list-style-type: none"> <li>Paved path on south side of Lighthouse Drive separated from the roadway by guardrail</li> <li>Access to Cobble Beach via steep wooden stairs</li> </ul>
Salal Hill Trail	Moderate	25-30 minutes round trip	36%	Unimproved	--	No	<ul style="list-style-type: none"> <li>Accessed from lighthouse parking lot behind the keeper's garden leading to a point above the Interpretive Center</li> </ul>
Communications Hill Trail	Most Difficult	15 minutes each way	15%	Gravel Road	Yes	No	<ul style="list-style-type: none"> <li>Trailhead to hang/paragliding launch sites</li> <li>Primitive trail to water tank and Agate Beach neighborhood</li> </ul>
Lighthouse Access	--	--	--	Sidewalk	--	Yes	<ul style="list-style-type: none"> <li>Recently reconstructed sidewalks from lighthouse parking lot to lighthouse and observation decks</li> </ul>

-- Not stated on trail signs.

Source: Bureau of Land Management, Trail Wayfinding signs, viewed on site in May 2021.

Other designated trails or pedestrian/bicycle routes in the vicinity of the study area are listed as follows.

- Lighthouse to Lighthouse Trail:** Lighthouse Drive is featured as part of the 10-mile trail on Newport's published bike maps. The route connects the Yaquina Bay and Yaquina Head Lighthouses traveling mainly on city streets and US 101.
- Oregon Coast Bike Route:** US 101 between the northern and southern Lincoln County lines is a designated bike route on the Lincoln County Bicycle Route Map. Bike lanes are provided on US 101 through the study area.
- Oregon Coast Trail (OCT):** A 362-mile hiking trail follows the Oregon coastline along beaches, state parks, public lands, US 101, city streets, and some easements on private property. Some sections called "gap sections" are identified in areas that are disconnected, inconvenient, unsafe, or inaccessible during certain seasons. The Agate Beach gap section instructs trail users to take 55th Street to US 101 and continue south following signs to Yaquina Head Lighthouse then returning to the beach at the Agate Beach access/parking area.

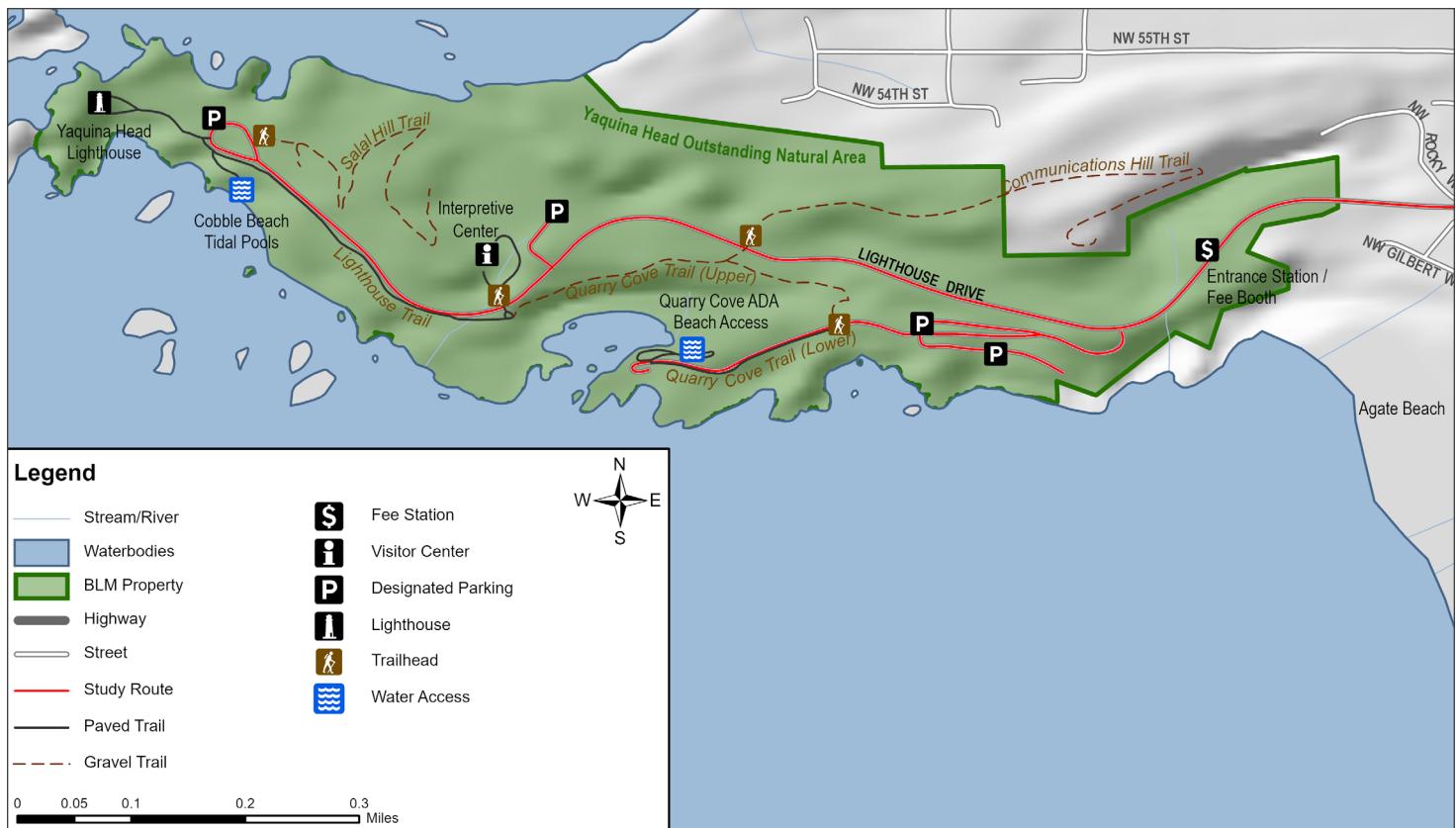


The Yaquina Head area is identified as a gap section in the OCT because the area lacks connectivity along the coastline.



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**FIGURE 4: YAQUINA HEAD ONA TRAILS**

## TRANSIT

Lincoln County Transit provides transit services to the Newport area via a city loop and inter-city routes between Lincoln City, Siletz, Yachats, Corvallis, and Albany.

- The **Newport City Loop** completes a full loop through Newport 6 times each day, 7 days a week. Buses are wheelchair accessible with bicycle racks. The closest transit stop to Yaquina Head ONA is Bloch Wayside/NE 52<sup>nd</sup> Street and is provided by request only.
- The **Transit Intercity – North County** route provides daily service along the coast in Lincoln County north of Nye Beach. Monday through Saturday, the bus completes 5 loops and stops at the US 101/NE 52<sup>nd</sup> Street intersection by request in the northbound direction only. On Sundays, the bus completes 4 loops and stops at the US 101/NE 52<sup>nd</sup> Street intersection on the first loop of the day and by request on the other 3 loops in the northbound direction only.
- The **Coast to Valley Express** is a service provided through a partnership between Lincoln County Transit and Benton County Transportation. The bus operates 7 days a week with 4 daily runs between Albany, Corvallis, and Newport with optional connections to Portland, the Portland International Airport, and other destinations on the coast. The Newport stop is located at Newport City Hall.
- A **Dial-A-Ride** service is also provided within the City of Newport. The buses operate from 8:00AM to 3:30PM Monday through Friday by reservation.



## 3.2. GEOMETRIC CONDITIONS

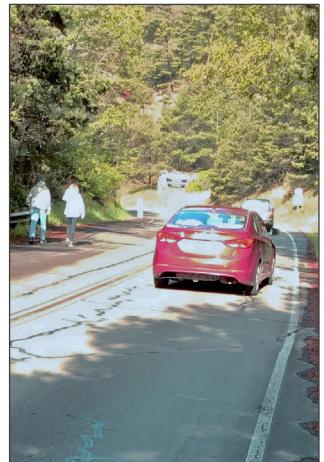
Existing roadway geometrics for Lighthouse Drive were evaluated and compared to current standards. As-built drawings from 1995 were available for the segment of Lighthouse Drive extending from the entrance station to the lighthouse parking lot. Field review and aerial photography were used to document existing roadway geometrics in this segment.

The collected traffic volumes classify Lighthouse Drive as a very low volume local road. Based on nationally accepted design standards, Lighthouse Drive generally meets all minimum design requirements regarding roadway widths, horizontal and vertical alignment, sight distance, and clear zone widths. The following deficiencies were identified:

- A narrow portion of the Quarry Cove access road does not meet the minimum roadway width.
- The curves on the Quarry Cove access road do not meet the minimum radii standards. This portion of the study area is signed at 15 miles per hour (mph), and none of the horizontal curves are considered to be potential areas of concern.
- The two curves to the east of Communications Hill were identified as providing limited sight distance due to the density of trees adjacent to the roadway.
- It is not always feasible to provide wide clear zone distances or side slopes due to the existing context of the roadway, including steep embankments or dense tree growth. Guardrail is in place along Lighthouse Drive in areas without sufficient side slopes.

## 3.3. SAFETY

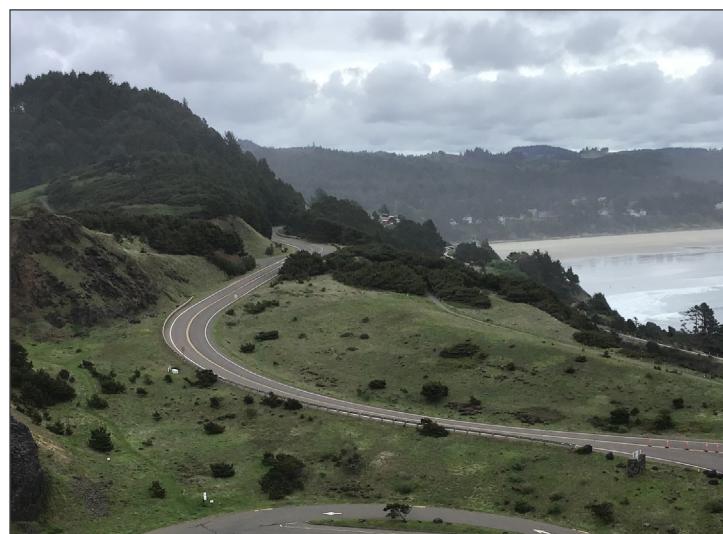
Concerns for pedestrian and bicycle safety have been noted and observed within Yaquina Head ONA and the surrounding area. In general, there is a lack of a continuous, dedicated facility for pedestrians on Lighthouse Drive. As a result, visitors entering the ONA on foot are often observed walking along the roadway shoulder and sometimes in the travel lanes. BLM staff and the public have noted potential conflicts between vehicles and pedestrians, especially in the section of Lighthouse Drive between the US 101 intersection and the entrance station.



*Due to a lack of dedicated pedestrian facility on Lighthouse Drive, many pedestrians walk in the roadway. Blind curves and high speeds further compound safety concerns.*

The ONA tends to experience high traffic volumes during peak periods at the entrance station, Keeper's Garden, and Lighthouse Circle, all of which lack dedicated crosswalks. Pedestrian-vehicle conflicts create safety concerns at these locations, within parking areas, and at other key crossing locations on Lighthouse Drive. At the entrance station, conflicts have been observed between pedestrians and opposing traffic as well as vehicles performing unsafe turnaround maneuvers. Staff safety has also been noted as a potential concern, particularly when staff are conducting line busting activities in live traffic. At Lighthouse Circle, there are no dedicated crosswalks or paths through the center of the parking lot. Many visitors walk randomly throughout the parking lot creating concerns for potential conflicts, especially since the mound in the center island blocks drivers' views.

Several other areas within the Yaquina Head site also lack pedestrian facilities or provide poor visibility. While some sidewalk is provided on the Quarry Cove access road, there is a gap in the sidewalk between the pullout on the south side of the couplet and the lower parking lot. The crosswalk between Quarry Cove Trail and Communications Hill Trail is located after a set of s-curves. Drivers sometimes travel too fast around these curves and do not realize there is a crosswalk approaching.



*A few locations at the Yaquina Head ONA do not meet minimum geometric design requirements.*



# YAQUINA HEAD

## Traffic Study



A continuous, protected pedestrian facility along the length of Lighthouse Drive is desired to improve pedestrian safety. Enhanced wayfinding may be needed to direct pedestrians to the path and reduce the potential for pedestrians in the roadway.

BLM staff and regular visitors have noted concerns regarding vehicle speeding issues on Lighthouse Drive. Speeding is primarily a concern on the segment of Lighthouse Drive between US 101 and the entrance station. Aggressive and unsafe driving has also been observed at the Interpretive Center intersection, with some visitors swerving into the opposing lane of traffic to bypass the cones directing traffic into the Interpretive Center parking lot. Visitors often circle the lighthouse parking lot waiting for parking spaces to become available, which causes congestion and general safety concerns since there are often pedestrians walking in the roadway at this location. Some visitors park in undesignated areas which sometimes includes obstructing travel lanes.

## 3.4. TRAFFIC CONDITIONS

Lighthouse Drive serves a variety of access purposes including residential, commercial, and recreational. Heading west from the US 101 intersection, approximately the first 0.1 mile of roadway contains several approaches that provide access to residential areas and businesses. The remainder of Lighthouse Drive generally serves users who are intending to visit Yaquina Head ONA. Passenger cars, delivery trucks, buses, RVs, emergency vehicles, bicycles, and pedestrians are all common on the roadway.

### 3.4.1. Visitor Entry Data

The BLM staff at the Yaquina Head ONA entrance station collect visitor entry data each day during regular operating hours. The staff tracks entering users and classifies them based on payment type, transportation mode, and visitor type. To approximate the total number of visitors, BLM uses a generalized estimate of 3 visitors per vehicle. Upon entry, BLM classifies vehicles as either a recreational or a non-recreational vehicle. Non-recreational vehicles include BLM staff, delivery vehicles, utility and maintenance vehicles, contractors, and other non-visitor vehicles. Recreational vehicles include all other vehicles which are assumed to be occupied by visitors. Only recreational vehicles are included in the visitation count.

Monthly visitor entry data were provided for the years 2015 through 2019. Overall, visitor numbers exhibited a steady growth rate of 2.8 percent per year. The data show that approximately 2,500 people visit Yaquina Head ONA on a typical day during the peak season, with spikes in visitation occurring over the weekends of Memorial Day and July 4<sup>th</sup> and at the end of July. The number of visitors recorded per month at the site over the 5-year period from 2015 to 2019 is displayed in **Figure 5**. As shown in the figure, visitation generally begins to increase in May with peak visitation observed in July. Numbers begin to decrease in October, and low volumes are recorded throughout the winter season. A slight increase in visitation is observed in the month of March, potentially corresponding to spring break and the spring gray whale migration.

An analysis of visitor transportation mode was also performed. Of the data provided by BLM, an average of 39 pedestrians, 6 bicycles, and 803 recreational vehicles were observed each day. This translates to approximately 2,450 daily visitors. Note, these values are recorded during the hours that the site is open and staffed by BLM. Many residents enter the site by foot or by bicycle before and after hours.

Upon entry, vehicles either present their pass (week, annual, or lifetime) or pay a fee to be issued a pass. When visitors have their pass already in hand, processing time at the gate is typically expedited. While there is considerable variability each day, the average mix of passes in hand and passes issued is nearly equal (53 and 47 percent, respectively). At the highest, the percent of visitors with a pass already in hand was 67 percent and was lowest at 24 percent.

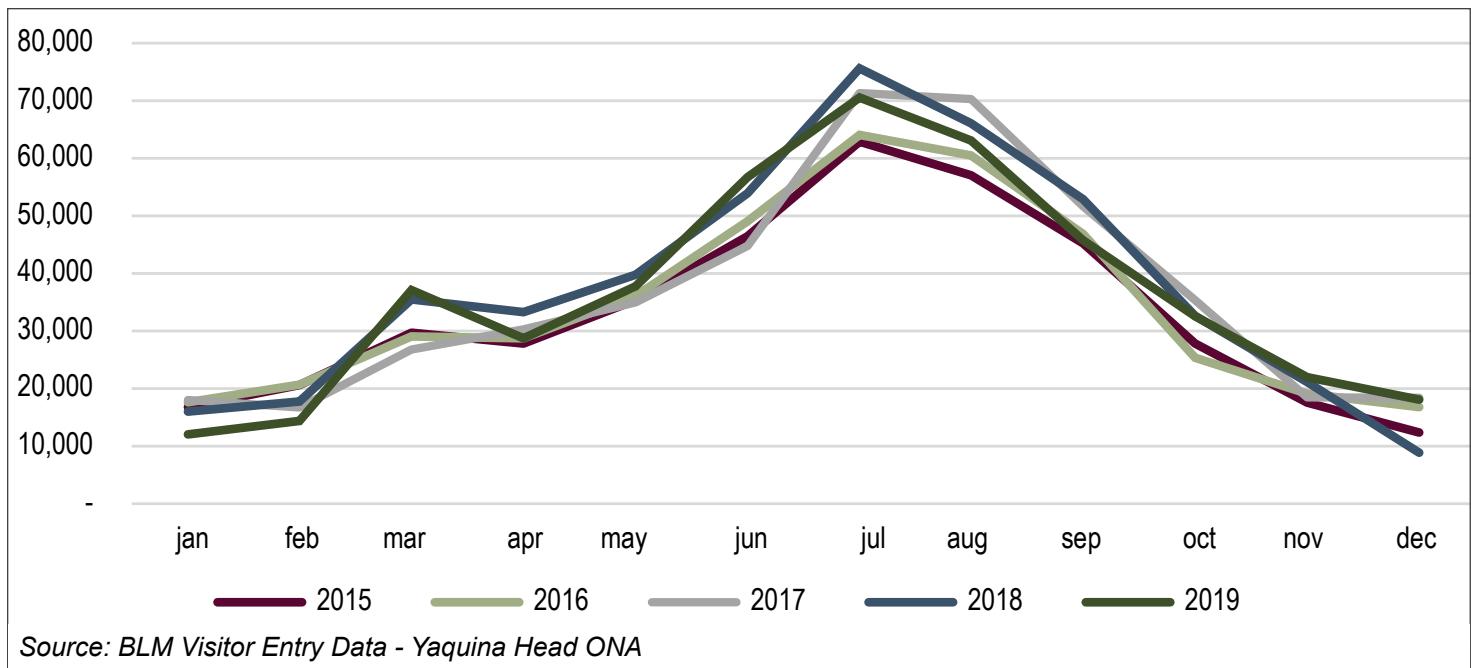


FIGURE 5: VISITORS PER MONTH

### 3.4.2. Traffic Volumes and Speeds

Traffic data were collected at Yaquina Head ONA in August 2021 including traffic volumes and speed information. Pneumatic road tubes were placed on Lighthouse Drive before and after the entrance station, on Lighthouse Drive between Quarry Cove and the Interpretive Center, on Lighthouse Drive near the Keeper's Garden, and along the access road for Quarry Cove to collect data. **Figure 6** presents a map of the locations where traffic data were collected along with the resulting volume data from the counts. See **Appendix B** for more information.

#### LIGHTHOUSE DRIVE TRAFFIC VOLUMES

Between 7:00 AM and 8:00 PM, a total of 586 and 694 vehicles entered the site on Friday and Saturday, respectively. A higher volume of traffic was observed on Saturday, which is expected given the recreational nature of Yaquina Head ONA. The entering and exiting patterns were found to be different between the two days, with a larger percentage of daily visitors arriving in the morning and leaving before noon on Friday. On Saturday, visitors appeared to arrive later and stay at the site longer with no defined peaks throughout the day. Based on a comparison of the number of vehicles counted at the sites both before and after the entrance, approximately 15 percent of vehicles on Lighthouse Drive reached the entrance and turned around without continuing into the site.

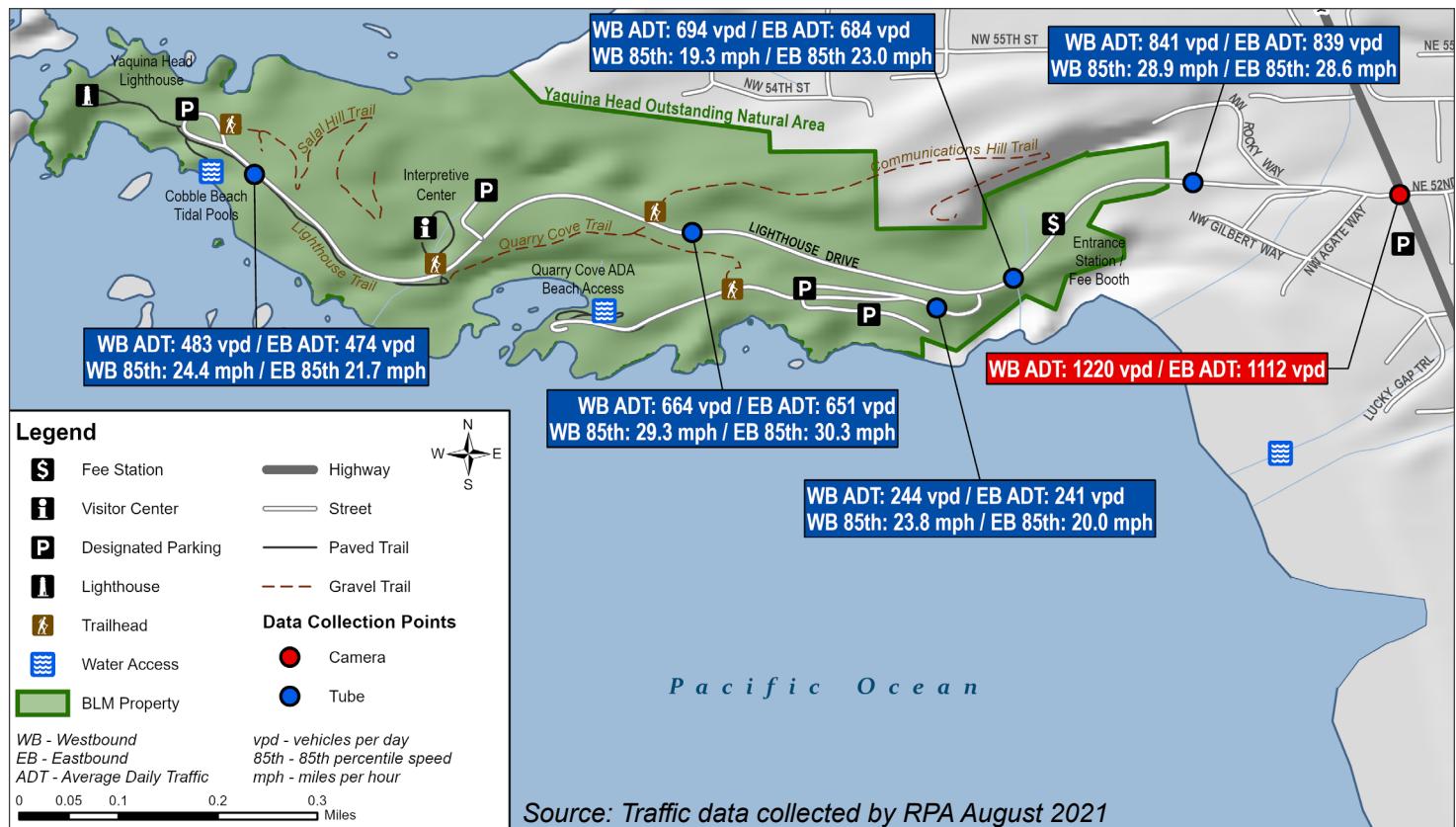
The parking lot at the end of Lighthouse Drive has 37 personal vehicle stalls, 3 large vehicle stalls, and 3 ADA accessible stalls. An additional 2 stalls are designated for official use only. Based on the collected traffic counts on Lighthouse Drive near the Keeper's Garden, this parking area reached or surpassed available capacity about 10 percent of the time on Friday and about 7 percent of the time on Saturday. On Friday, the lot was at capacity (45 cumulative vehicles or more) between 10:00 AM and 11:30 AM. The peaks on Saturday exceeded 45 vehicles for only one 15-minute interval at 10:30 AM. When the Interpretive Center is open, vehicles are directed into the Interpretive Center parking lot by cones placed at the intersection.

#### QUARRY COVE ACCESS ROAD TRAFFIC VOLUMES

Beyond the Yaquina Head ONA entrance, pneumatic road tubes were placed along the access road for Quarry Cove. The Quarry Cove parking lot has approximately 55 parking stalls. Based on the volume counts on the Quarry Cove access road, this parking lot never reached capacity on the days of observation. On Friday, two peaks occurred at 11:30 AM and 3:00 PM with approximately 16 vehicles each. On Saturday, 1 distinct peak occurred at 11:45 AM with 25 vehicles. Generally, 10 or more vehicles were counted in the Quarry Cove area for the majority of the day from 11:00 AM until 5:30 PM.



# YAQUINA HEAD Traffic Study



**FIGURE 6: TRAFFIC VOLUME DATA**

## VEHICLE SPEEDS

Most of the site is signed at 25 mph, except the Quarry Cove access road and Lighthouse Drive in the eastbound direction only near the Keeper's Garden, which are signed at 15 mph. US 101 through the study area is signed at 45 mph. Input from BLM suggested that posted speed limits are not well respected within the Yaquina Head ONA boundaries, and vehicles often speed through the site, endangering non-motorists and motorists alike.

Along with traffic volume information, the pneumatic tube counters were used to collect speed data. Using the collected data, the 85<sup>th</sup> percentile speed was determined for each count site. The 85<sup>th</sup> percentile speed is the speed at or below which 85 percent of vehicles are observed to travel. **Figure 6** presents the observed 85<sup>th</sup> percentile speeds. See **Appendix B** for more information.

Based on the 85<sup>th</sup> percentile speeds, all vehicles generally traveled below or within about 5 mph of the posted 25 mph speed limits. The most common spots at which speeding vehicles were noted were within the 15 mph zones. In the westbound direction on the Quarry Cove access road, 88 percent of vehicles were observed exceeding the speed

limit. Near Keeper's Garden, 20.2 percent of vehicles were observed exceeding the 15 mph speed limit. For all 25 mph zones combined, approximately 4.3 percent of vehicles were observed speeding. Comparatively, about 32.8 percent of vehicles were speeding within the combined 15 mph zones.

### 3.4.3. Projected Growth and Traffic Conditions

The *Newport Transportation System Plan<sup>5</sup>* (TSP) forecasted future (2040) traffic conditions using the latest (2018) Newport Travel Demand Model developed and maintained by ODOT. The model predicted future traffic volumes based on an assumed 21 percent overall increase in households and 20 percent increase in the number of jobs in Newport.

Based on TSP assumptions, Lighthouse Drive could experience traffic volumes greater than 3,000 during the peak summer season within the next 20 years. During the spring season, upwards of 2,500 vehicles could be observed on Lighthouse Drive by 2042.



# Chapter 4: Environmental Setting

*The environmental setting includes naturally occurring features and populations as well as human influences and characteristics. These elements provide context for transportation projects and may serve as potential constraints or opportunities during the project development process. Summaries reflect available environmental information. Appendix B provides additional details about environmental conditions within the study area.*



# YAQUINA HEAD

## Traffic Study

## 4.1. PHYSICAL ENVIRONMENT

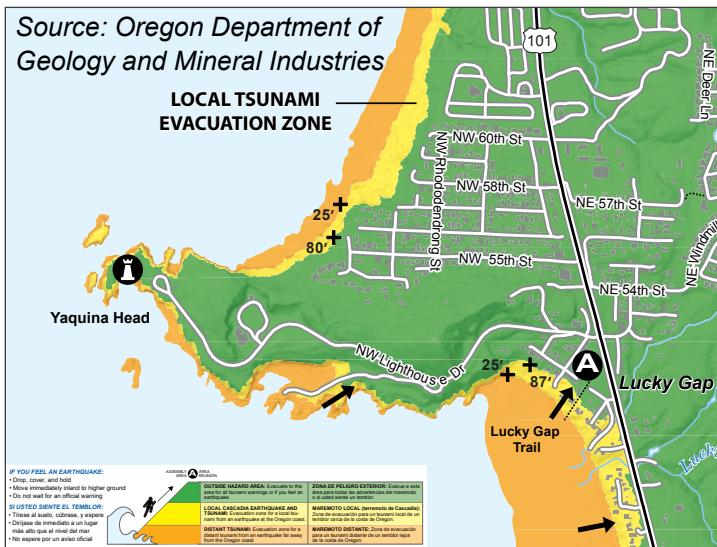
The physical environment includes natural elements such as soil and rock features, water sources, wetlands, floodplain areas, air quality, and human influences such as developed land areas, farmlands, hazardous materials sites, residences, and areas sensitive to noise impacts.

### 4.1.1. Land Ownership and Land Use

Lands surrounding Yaquina Head ONA are mostly privately held, although some bordering lands are owned by the City of Newport and Lincoln County. BLM owns the nearly 100 acres of Yaquina Head ONA including all roads. The right-of-way for Lighthouse Drive and US 101 is held in public interests. The City of Newport is responsible for Lighthouse Drive from the US 101 intersection extending about 850 feet west and ODOT is responsible for US 101. The small parking lot adjacent to Lighthouse Drive near the US 101 intersection is mostly within private right-of-way while the Ernest Bloch Memorial Wayside parking lot along US 101 south of Lighthouse Drive is within the US 101 right-of-way.

### 4.1.2. Soil Resources and Prime Farmland

Mapping developed by the US Department of Agriculture Natural Resource Conservation Service show that no prime farmland exists within the Lincoln County Area. About 11 percent of the lands are classified as farmland of statewide importance.



The majority of the Yaquina Head ONA is located outside the hazard zone for a tsunami caused by an earthquake.

### 4.1.3. Geologic Hazards

The study area lies within the Siletz-Yaquina Watershed and is primarily composed of Quaternary sediments and Miocene volcanic and marine sedimentary rocks.<sup>6</sup> Coastal erosion and landslides are extensive from Otter Rock southward to Yaquina Head. Large landslides occur on both the north and south sides of Yaquina Head. The majority of Yaquina Head ONA is considered to be at moderate to high risk for landslide occurrence. Additionally, seismic hazards are considered one of the major natural hazards in Oregon, with the strongest earthquake effects generally felt closer to the coastline. Tsunamis and coastal erosion are additional geologic hazards that could potentially affect the study area.<sup>7</sup> Due to its elevation, almost the entire ONA is outside the hazard area for a tsunami resulting from an earthquake. However, the Quarry Cove ADA access road is within the hazard area for both a local and distant tsunami.

### 4.1.4. Surface Waters

The study area lies entirely within the Siletz-Yaquina and Moolack Creek Watersheds. Although no prominent surface water features cross or run parallel to Lighthouse Drive, 3 intermittent unnamed streams cross Lighthouse Drive. These streams, by definition, only hold water during wet portions of the year (October through April).

### WATER QUALITY

The Moolack Creek Watershed is rated as impaired for aquatic life. The impairment categories were identified as low oxygen levels in the water and impaired biota, meaning that the biological community within the water body is unhealthy or the population numbers are significantly lower than expected. The Yaquina Head area is also rated as impaired for fish and shellfish consumption.

### 4.1.5. Groundwater

There are 6 wells within the Yaquina Head ONA: 5 water wells and 1 geotechnical well. One water well is used for industrial purposes and one was used for water monitoring purposes. The intended use of the other wells is unknown.

### 4.1.6. Wetlands and Waters of the U.S.

National Wetland Inventory<sup>8</sup> mapping for the study area shows primarily estuarine and marine wetlands, freshwater ponds, and various rivers and stream channels. Three unnamed, intermittent riverine features cross Lighthouse Drive at separate locations.

#### **4.1.7. Floodplains and Floodways**

The entirety of Lighthouse Drive runs adjacent to the coastal floodplain, but the roadway itself lies outside of the floodplain boundary. A small area on the end of Quarry Cove Road lies within the coastal floodplain boundary. The Federal Emergency Management Agency categorizes the headland and inland portion of the study area as Zone X, meaning this is an area of minimal flood hazard. The Pacific Ocean along Quarry Cove and Cobble Beach is subject to flooding by the 1-percent-annual-chance flood event due to high velocity waves that are typically present during storms (Zone VE).

#### **4.1.8. Hazardous Substances**

The Yaquina Head Lighthouse is listed as a very small quantity generator in the US Environmental Protection Agency (EPA) Hazardous Waste Site database.

#### **4.1.9. Air Quality**

Lincoln County is considered an attainment area for all pollutants, and therefore proposed transportation projects would likely not be subject to conformity requirements.

#### **4.1.10. Noise**

Residences in the study area are sensitive noise receptors that could be affected by roadway improvements within Yaquina Head ONA. Sites within the study area protected under Section 4(f) of the U.S. Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act may also be considered sensitive noise receptors.

Construction activities associated with improvements resulting in substantial roadway changes within Yaquina Head ONA may result in localized and temporary noise impacts in the vicinity of residences. These impacts can be minimized by incorporating measures to control noise sources during construction.

### **4.2. BIOLOGICAL RESOURCES**

The biological environment includes plants and animals known or likely to occur in the study area, including sensitive species protected by state and federal regulations.

#### **4.2.1. Vegetation**

Several vegetation types occur within the Yaquina Head ONA study area, including mixed hardwood and coniferous forest, coastal spruce, and western hemlock forest. The

majority of Yaquina Head ONA is classified as conifer, developed, or non-vegetated.

Invasive weeds are a growing concern in Lincoln County. Nine species of noxious weeds are known to occur within the study area. All are designated as 'List B' by the State of Oregon, meaning they are regionally abundant but may have limited distribution in some counties. Intensive control measures for these weeds are conducted at the state, county, or regional level and are determined on a case-by-case basis. The known noxious weeds within the study area are knotweed, herb Robert, ivy, giant knotweed, Armenian blackberry, field bindweed, bull thistle, Canada thistle, and St. Johnswort.

#### **4.2.2. Fish and Wildlife**

Bird observation is a common activity at Yaquina Head ONA. During the breeding season, typically from May to August, seabird breeding colonies can be observed within close range of Yaquina Head ONA facilities. According to the US Fish and Wildlife Service (USFWS), 5 species of seabird and 1 shorebird species breed on the coast at Yaquina Head ONA. Two varieties of cormorants can be observed: Brandt's and Pelagic. The Brandt's cormorants in the area typically nest on the rock tops along the coast, and the Pelagic cormorants nest among the cliff faces. Pigeon guillemots and western gulls are also observed along the cliff ledges. Black osytercatchers frequent the tides in search of food. The common murre, an abundant seabird in Oregon, is often observed on the nearshore sea stacks. Other birds that frequent or pass through Yaquina Head ONA include brown pelicans, bald eagles, harlequin ducks, surfbirds, and black turnstones.



*Bird and wildlife viewing is a popular activity at Yaquina Head ONA.*



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Other wildlife that are commonly observed in the area are gray whales and harbor seals. Gray whales pass by Yaquina Head ONA just off the coast, and harbor seals can be observed with their young resting on the coastal rocks, which are managed by the USFWS as part of the Oregon Islands National Wildlife Refuge. They provide sanctuary for the harbor seals and seabirds and are closed to public access year-round.

### 4.2.3. Threatened and Endangered Species

There are 9 species federally listed as threatened or endangered that are known or believed to either reside within the study area or have the potential to be indirectly affected by project activities within the study area. The species include the pacific marten, marbled murrelet, northern spotted owl, western snowy plover, short-tailed albatross, leatherback sea turtle, loggerhead sea turtle, olive ridley sea turtle, and the Oregon silverspot butterfly. Species often move and habitats change, therefore the noted species are not guaranteed to be found within or near the study area at the time of a future project.

### 4.2.4. Other Species of Concern

Species of concern are native animals or plants that are at risk to declining population trends, threats to their habitats, and restricted distribution, among other factors. The red tree vole, a small rodent that inhabits treetops, is native to coniferous forests west of the crest of the Cascade Mountains in Oregon and northwestern California and generally are found at lower elevations. Within Oregon, the north coast area, which does not include Lincoln County, is the primary focus of species preservation and habitat management efforts. Given that they are primarily a tree-dwelling species, they are very vulnerable to activities such as development, recreation, and road construction, that could potentially cause tree reduction or disturbance.<sup>9</sup>

## 4.3. SOCIAL AND CULTURAL RESOURCES

The study evaluated the social and cultural environment within the study area, including characteristics of the human population, living and working conditions, recreation uses, culturally important sites, and visual character. These elements reflect human experiences and values.

Source: Erin Ross



*The Yaquina Head ONA may be habitat for the endangered Oregon silverspot butterfly. Impacts to their habitat should be avoided or otherwise mitigated with any potential improvements.*

### 4.3.1. Demographic Conditions

The City of Newport is slightly more diverse, racially and ethnically, than both Lincoln County and the state of Oregon. Persons identifying as White make up approximately 71 percent of the population in Newport, 83 percent of the population in Lincoln County, and 76 percent of the population in Oregon. The percentage of the population identifying as Hispanic or Latino is greater in Newport (20 percent) compared to Lincoln County (9 percent) and Oregon (13 percent). Persons identifying as Black or African American make up nearly 2 percent of the population in Oregon and Newport compared to 0.6 percent in Lincoln County. The percent of the statewide population identifying as Asian is about 4 percent in Oregon and approximately 2 percent and 1 percent in Newport and Lincoln County, respectively. For all other races, the city, county, and state have comparable population distributions.

### ENVIRONMENTAL JUSTICE

To better meet responsibilities related to the protection of public health and the environment, the EPA has developed an environmental justice mapping and screening tool called EJSCREEN based on nationally consistent data and an approach that combines environmental and demographic indicators in maps and reports. While the EJSCREEN report (**Appendix B**) indicates that most environmental and demographic indicator values for Yaquina Head ONA are below comparable values for the State of Oregon, EPA Region, and the nation, minority and/or low-income populations are present in the area.

### 4.3.2. Economic Characteristics

Median household incomes in Newport and Lincoln County are both below the state median values. The median income in Newport is approximately 22 percent lower than that of the statewide median, while that in Lincoln County is 24 percent lower than the statewide median. The poverty rates in Newport and Lincoln County are both above that of the overall poverty rate in Oregon. The statewide unemployment rate is also less than that of the city and county rates.

In 2019, the City of Newport employed approximately 4,467 people. The largest employing industry in the city was accommodation and food services (18 percent). Retail trade employed 13 percent and health care and social assistance employed 11 percent of the population in Newport. The highest paying industries were utilities (\$103,750), professional, scientific, and technical services (\$53,750), and public administration (\$52,708).

Historically, the tourism industry has thrived in Newport. Newport boasts a plenitude of tourist attractions including museums and city parks. Recreational opportunities are also in abundance including fishing, boating, biking, and various other activities. The national and state parks and historical sites in the area also continue to attract tourists.

### 4.3.3. Cultural and Historic Resources

The Yaquina Head Lighthouse is classified as being of natural historic significance, and it is denoted with a Lincoln County Historical Society marker. The site is also listed on the National Register of Historic Places (NRHP). The NRHP is an official list of historic places in the US that have been deemed worthy of preservation. Qualified historic locations may receive preservation assistance and incentives. According to the Tribal Directory Assessment Tool, three tribes with potential interest in Lincoln County include the Confederated Tribes of Siletz Indians of Oregon, Confederated Tribes of the Grand Ronde Community of Oregon, and the Confederated Tribes of the Warm Springs Reservation of Oregon.

### 4.3.4. Section 4(f) Resources

Section 4(f) of the *U.S. Department of Transportation Act* protects publicly owned public parks, recreation areas, wildlife/waterfowl refuges, and historic sites of national, state, or local significance on public or private land that

are potentially eligible for listing or are listed on the NRHP. The Yaquina Head Lighthouse is listed on the NRHP and impacts to the study area should be investigated and appropriately considered in accordance with Section 4(f) if improvement options are forwarded from this study.

### 4.3.5. Section 6(f) Resources

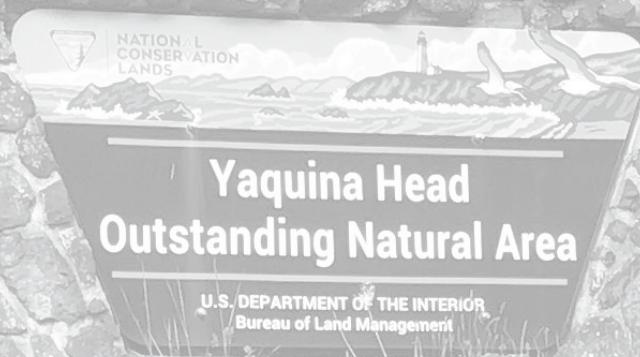
Section 6(f) protection applies to public recreational sites purchased or improved with *Land and Water Conservation Fund Act* funds. It does not appear that any projects funded under Section 6(f) of the are within the vicinity of the study area.

### 4.3.6. Visual Resources

The study area boasts a high level of scenic quality. Protruding approximately a mile into the Pacific Ocean, Yaquina Head ONA is comprised of lush vegetation, sandy beaches, and a dark basalt coast. The rocky areas of Cobble Beach provide excellent tidepool viewing opportunities. The *City of Newport Comprehensive Plan* expanded the Ocean Shorelands Boundary in 1991 to include Yaquina Head as a major visual resource of the Newport area due to the seaward exposure of the headland.



The Yaquina Head Lighthouse is listed on the NRHP and is subject to protections under Section 4(f).



# YAQUINA HEAD

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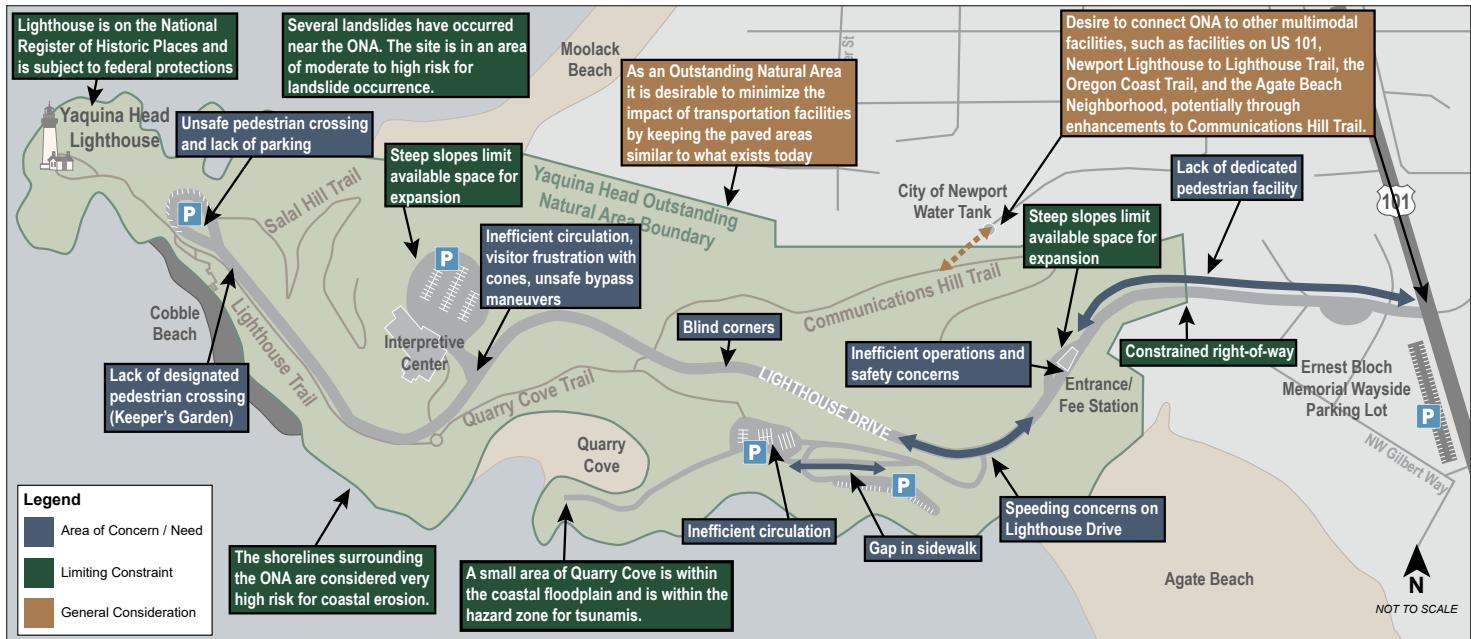
# Chapter 5: Goals, Objectives, and Other Considerations

*Goals, objectives, and other considerations were identified based on a comprehensive review of existing information and input from the study team, stakeholders, and the public. A summary of the identified needs and concerns, limiting constraints, and other considerations that helped guide development of the goals and objectives is shown in Figure 7.*

*Goals and objectives are important in explaining why a potential improvement option may be necessary, whereas other considerations serve as constraints that may limit potential improvements. The following statements reflect the existing social, environmental, and engineering conditions and recognize the local and regional use of Lighthouse Drive and the adjoining transportation system.*



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**FIGURE 7: KEY FINDINGS SUMMARY**



## Goal 1: Improve operation of the roadway corridor, entrance station, and parking lots.

Yaquina Head ONA receives approximately 500,000 visitors each year. The number of visitors to the site is expected to continue growing due to increased recreational interest and opportunities. Consequently, Lighthouse Drive and other site transportation facilities are projected to experience increased traffic volumes. As the number of visitors continues to increase, it will be important to provide a transportation system that can efficiently accommodate increasing traffic volumes for many years to come.

Field observation and personal accounts from BLM staff and Yaquina Head ONA visitors indicate a need to improve the overall operability of the transportation system to accommodate visitor demand. With the current configuration of the entrance gate, vehicles often back up while waiting in the entrance line, occasionally extending all the way to US 101, causing visitor delay and frustration. Visitors and staff have also indicated a need for improved vehicle circulation throughout the site, especially in the Quarry Cove, Interpretive Center, and Lighthouse parking lots. Additional ADA and RV parking is also desirable.

### **OBJECTIVES:**

- Reconfigure the entrance station to improve efficiency.
- Reconfigure parking lots to improve circulation and provide adequate ADA and RV parking opportunities.



## ***Goal 2: Improve the safety of the transportation system for all roadway users.***

Lighthouse Drive lacks dedicated non-motorized facilities between the US 101 intersection and the Interpretive Center, increasing the potential for vehicle-pedestrian conflicts on the roadway, especially on blind corners with limited sight distance. Additionally, non-motorists have indicated that the travel speeds of vehicles within the site contribute to poor safety and feelings of discomfort.

### **OBJECTIVES:**

- Reduce potential for vehicle/non-motorist conflicts.
- Construct facilities that lower vehicle speeds.



## ***Goal 3: Provide multimodal transportation facilities that connect to destinations within the site and to the regional transportation system.***

Visitors, stakeholders, and staff have expressed a desire for improved multimodal transportation connections to destinations and recreational opportunities within the site, as well as to the larger regional transportation system. In addition to attractions within the Yaquina Head ONA, other prominent recreational trails in the vicinity of the ONA include the OCT, Lighthouse to Lighthouse Trail, and Oregon Coast Bike Route. Providing improved connectivity for pedestrians, bicycles, and vehicles between these attractions and the ONA will improve accessibility to the site and potentially increase visitation. Improving connectivity to the existing public transportation system in Newport, Lincoln County, and the broader state of Oregon, is also important to ensure equitable access to the site and offer mode choice.

### **OBJECTIVES:**

- Facilitate multimodal transportation access to recreational opportunities within the Yaquina Head ONA and the broader region.
- Provide multimodal facilities consistent with local planning efforts and recreational needs.
- Integrate with regional public transportation travel options.



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### *Goal 4: Extend the useful life of transportation facilities.*

To keep the site's transportation facilities operating safely and efficiently for visitors, various upgrades, repairs, or maintenance activities may be necessary. If facilities are insufficiently maintained, roads can quickly deteriorate, impacting visitor travel and requiring costly repairs or replacements. Although ongoing maintenance is performed by BLM staff, the existing pavement on Lighthouse Drive is over 20 years old and is beginning to exhibit deteriorating condition in a number of locations, and a section of the Quarry Cove access road has continually experienced sloughing issues, despite repairs.

#### **OBJECTIVES:**

- Conduct appropriate preventive maintenance activities to extend the life of existing facilities.



### *Other Considerations*

Yaquina Head ONA is a protected area designated by Congress to provide for the conservation and development of the scenic, natural, and historic values of the area; the continued use of the area for education, scientific study, and public recreation; and protection of the wildlife habitat of the area. The Yaquina Head Lighthouse, holds historical value and is a popular tourist destination. When proposing potential improvements to the ONA, potential impacts to the environment, cultural, scenic, and recreational aspects of the site and surrounding areas should be considered. Any adverse impacts should be avoided, minimized, or otherwise mitigated with positive impacts elsewhere within the site.

To preserve the ONA, it is important to BLM, stakeholders, and visitors to minimize the amount of new pavement and impermeable surfaces required for improvements and provide additional vegetation wherever feasible. Likewise, it is important to minimize temporary impacts from construction and be mindful of any barriers to construction feasibility due to geotechnical and other environmental constraints. New facilities should fit within existing right-of-way to minimize costs and impacts. To determine if facilities are financially feasible, the cost of construction and routine maintenance should be considered and eligibility for potential funding sources should be reviewed. Beyond the ONA boundary, it is important to ensure projects align with any ongoing and future local and regional planning efforts such as the Newport TSP and *Greater Newport Area Vision 2040*.

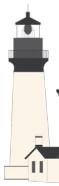
The following constraints and other factors should be taken into consideration when identifying potential improvement projects within the Yaquina Head ONA.

- Context, function, and use of the ONA
- Impacts to environmental resources
- Temporary construction impacts
- Construction feasibility and physical constraints
- Maintenance cost and responsibility
- Alignment with local and regional planning efforts
- Existing right-of-way
- Funding availability



# Chapter 6: Improvement Options

*Several concerns were identified that could be potentially mitigated through implementation of sitewide multimodal management strategies and site-specific improvements as summarized in the following sections.*



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## 6.1. SITEWIDE IMPROVEMENT STRATEGIES

Several concerns were identified that could be potentially mitigated through traffic calming, wayfinding, improved accommodations for pedestrians, bicyclists, and transit riders, and implementation of other sitewide strategies. Beneficial strategies that could be feasible to implement in the Yaquina Head ONA are described in the following sections. Varying levels of additional staffing may be required to implement the proposed strategies. If pursued, a determination of staffing availability and additional needs will be made by BLM prior to implementation. A summary of the proposed strategies is provided in **Table 3**.

### 6.1.1. Traffic Calming Strategies

Traffic calming has been shown to increase the quality of roadway user experience, particularly for non-motorized users. Traffic calming methods, depending on the technique, can be used to reduce vehicle speeds or volumes. Most of the roadways within the Yaquina Head ONA are signed at 25 mph, except the Quarry Cove access road in both directions and Lighthouse Drive in the eastbound direction near the Keeper's Garden, which are signed at 15 mph. Vehicles have been observed to travel above the posted speed limits at the site. Given the high presence of pedestrians on and adjacent to the roadway, especially along Lighthouse Drive, there is an increased potential for conflict between pedestrians and vehicles.

Implementation of traffic calming measures would be beneficial in helping to reduce vehicle speeds and increase the safety for non-motorized users. Several potential traffic calming techniques have been identified for possible implementation on roadways within Yaquina Head ONA. A summary of the advantages, disadvantages, and other considerations for each strategy is in the following sections.



Slower speeds are desired to protect non-motorized users on site.



A sitewide speed limit of 15 mph may be desirable at Yaquina Head ONA.

### LOWER POSTED SPEED LIMIT

The *Manual on Uniform Traffic Control Devices*<sup>10</sup> (MUTCD) generally recommends that the posted speed limit should be within 5 mph of the 85<sup>th</sup> percentile speed of free-flowing traffic, which is the speed that 85 percent of vehicles travel at or below. The 85<sup>th</sup> percentile speed is typically considered to be the speed at which drivers are comfortable driving on a road and is a good indicator of a reasonable speed limit. However, the MUTCD also specifies other characteristics that may be considered, such as roadside development, parking presence, and pedestrian activity.

While the MUTCD does not provide guidance on how to incorporate these factors into the process of setting a speed limit, the *Methods and Practices for Setting Speed Limits*<sup>11</sup> prepared by FHWA and the Institute of Transportation Engineers describes several methods for altering speed limits. One method, referred to as the engineering approach, entails first determining a speed within 5 mph of the 85<sup>th</sup> percentile speed and then adjusting it accordingly after reviewing the roadside environment and characteristics.

Based on speed data collected at multiple locations within the ONA in August 2021, the 85<sup>th</sup> percentile speeds were all generally below or within 5 mph of the posted 25 mph speed limits. Recorded 85<sup>th</sup> percentile speeds ranged from 19.3 mph (Lighthouse Drive west of the entrance) to 30.3 (Lighthouse Drive between Quarry Cove and the Interpretive Center). Most of the speeding vehicles were observed in the 15 mph zones. Approximately 4.3 percent of vehicles were speeding within the combined 25 mph zones, while 32.8 percent of vehicles were speeding within the combined 15 mph zones.

Given the high pedestrian activity on Lighthouse Drive and the roadway context within the ONA, engineering judgment may be used to lower the posted speed limit below the 85<sup>th</sup> percentile speed. A sitewide speed limit of 15 mph may be appropriate to lower travel speeds and reduce confusion over changing speed limits at the site. It is however important to note that lowering the speed limit does not guarantee that vehicles will travel at the posted speed limit since the 85<sup>th</sup> percentile speed is generally a representation of typical driver behavior. Additionally, enforcement is needed to ensure vehicles travel at the posted speed.

## SPEED FEEDBACK SIGNS

Dynamic speed feedback sign systems are traffic control devices that are programmed to provide a message to drivers exceeding a certain speed threshold. These systems are typically installed in conjunction with a speed limit sign and usually include a speed-measuring device such as a loop detector or radar to measure vehicle speeds. When vehicles exceed a predetermined speed threshold, the feedback signs display messages such as "YOUR SPEED XX MPH," "SLOW DOWN," or similar messaging to alert drivers traveling above the posted speed limit.

When appropriately complemented with enforcement, speed feedback signs can be an effective method for reducing speeds at a desired location. Without enforcement, drivers who pass the sign regularly may become accustomed to its presence and may begin to disregard its messages. This may not be a substantial concern at Yaquina Head, since the site attracts more irregular visitors than frequent users.



Source: City of Fort Walton Beach

*Speed feedback signs display a message when drivers are exceeding the posted speed limit.*

## WARNING SIGNS

The MUTCD provides guidance for additional warning signs that may be effective in reducing vehicle speeds. Warning signs such a pedestrian warning sign (W11-2) or a share the road (W16-1P) plaque may alert drivers to the potential for pedestrians and bicyclists on or near the roadway and may result in slower vehicular travel speeds. MUTCD guidance for the installation of signs of this type recommends using engineering judgment to determine the need for additional warning signs on the roadway. At the ONA, pedestrian warning signs are already used near pedestrian crossings. If bicycle use increases, share the road signage may be useful. However, signs should be used sparingly to avoid causing information overload for users and/or detract from the natural setting of the ONA.



Source: MUTCD

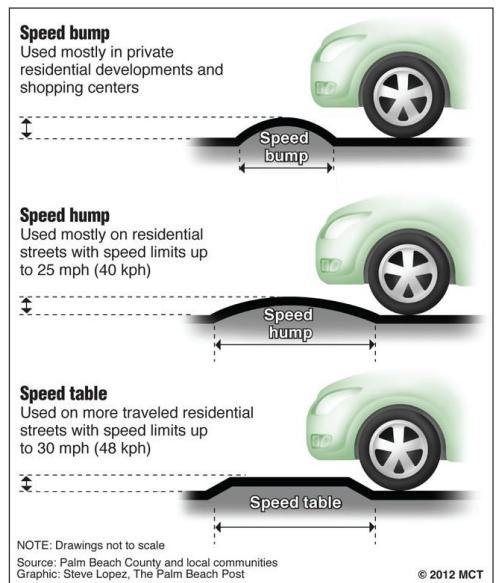
*Pedestrian warning signs are already used at some locations on site.*

## SPEED BUMPS, HUMPS, AND TABLES

Speed bumps, humps, and tables are vertical obstacles commonly used in traffic management to reduce vehicle travel speeds. All 3 devices are vertical structures in the road that jolt the occupants of a vehicle moving too quickly over them. They can be made from asphalt, concrete, plastic, rubber, or metal.

Speed bumps are the most aggressive traffic calming device and are most useful in parking lots and driveways. A speed bump generally slows traffic to 2–10 mph, giving both people and cars time to react safely to one another. Speed bumps are rarely used on public roadways because they require vehicles to slow to a near stop to pass over them and can cause damage to cars moving at posted speeds. Speed bumps are typically 2 to 4 inches high and between 6 inches to 2 feet long measured in the direction of vehicular travel.

Speed humps are raised areas of pavement that are often installed across low-volume, low-speed roadways to slow traffic speeds. Speed humps are typically 3 to 4 inches in height and 12 to 14 feet in length. Speed humps can reduce travel speeds to 15 to 20 mph. Speed humps are most often placed in a series to maintain speed reduction through a long corridor.



*Speed bumps, humps, and tables vary in width and height and serve different transportation purposes.*



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Speed tables are midblock traffic calming devices that raise the entire wheelbase of a vehicle to reduce its traffic speed. Speed tables are longer than speed humps and have a flat top, typically with a height of 3 to 3.5 inches and a length of 22 feet. Where a speed table coincides with a pedestrian crossing, it should be designed as a raised crosswalk. Speed tables are often designed using pavement markings, colored pavers, or other distinctive materials to help make the speed table visible for all roadway users.

On roadways within the Yaquina Head ONA, speed humps or speed tables installed at pedestrian crossings would be the most appropriate tool for reducing vehicle speeds. While these devices have mostly positive impacts and are typically successful in reducing average vehicle speeds, they may impact the ease of emergency-vehicle travel on the roadways where they are installed. As a result, speed humps are not recommended for installation on major roadways or emergency routes. This is particularly troublesome at the ONA since Lighthouse Drive is the only ingress and egress route for the site. Additionally, since speed humps interrupt the free flow of traffic, they may be frustrating to visitors and staff and prompt a negative response from their implementation.



*Providing gaps in speed management devices can help with emergency vehicle access.*

## NARROW TRAVEL LANES

Travel lanes are striped to define the intended travel path for vehicles within a corridor. Historically, wider travel lanes (11 to 13 feet) have been used to provide a more forgiving buffer to drivers, especially in high-speed environments. Conversely, narrower lanes may feel more uncomfortable to drivers, naturally encouraging them to slow down to navigate the roadway. In addition to managing speeds, narrower lanes also reduce exposure and crossing distances for pedestrians at crossings.

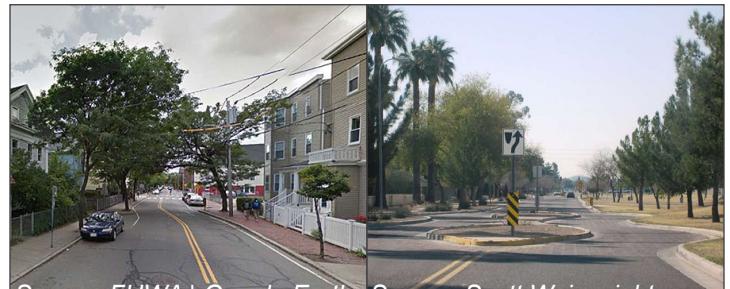
The travel lanes at the Yaquina Head ONA vary but are generally 11 feet in width. Generally, travel lane widths of 10 feet are considered appropriate to provide adequate vehicle safety while still discouraging speeding. However, additional width may be necessary for routes carrying high volumes of heavy trucks or buses and at locations with tight curves. Narrowed lane widths can easily be achieved by restriping the existing pavement for minimal cost. The space gained could then be used to accommodate non-motorized users such as a pedestrian pathway or bike lanes.

## LATERAL SHIFTS AND CHICANES

A lateral shift is a realignment of an otherwise straight roadway that causes travel lanes to shift direction in an effort to reduce vehicle speeds. Typically, lateral shifts separate opposing traffic with the aid of a raised median. Without the median, a motorist could easily cross the centerline in order to drive the straightest path possible or veer into the path of opposing traffic, reducing the effectiveness of the device.

A chicane is a series of alternating curves or lane shifts that are positioned in a way that forces motorists to steer back and forth out of a straight travel path. The curvilinear path is intended to reduce the speed at which a motorist is comfortable traveling through the feature.

Lateral shifts can be applied on roadways with all levels of traffic volumes, while chicanes are most appropriate on low-volume roads. Both devices are most effective on roadways with speed limits of 35 mph or lower. Both devices can be used along a primary emergency vehicle route, provided traffic volumes are low enough to allow an emergency vehicle to straddle the roadway centerline and where medians are designed to be easily mounted or straddled by emergency vehicles if needed.



*Lateral shifts [left] and chicanes [right] help reduce vehicle travel speeds by forcing motorists to steer in non-linear paths. Chicanes are typically more effective at reducing speeds, but lateral shifts are typically more efficient for emergency vehicles.*

Both lateral shifts and chicanes can slow traffic by encouraging drivers to moderate their speed using horizontal deflection. However, the effectiveness of the devices is dependent on the length of the alignment shift, as well as the volume and distribution of traffic. The devices are less effective in situations where traffic volumes are significantly higher in one direction than the other, or where volumes are so low that the likelihood of encountering an opposing vehicle within the lateral shift/chicane zone is low. Chicanes typically achieve a greater speed reduction than lateral shifts.

### **6.1.2. Pedestrian Accommodation Strategies**

Multiple pedestrian opportunities are provided at Yaquina Head ONA and in the surrounding area. Visitors entering the site on foot do not have to pay entrance fees. Once inside the ONA, several pedestrian trails ranging in difficulty and surface type are provided. A common concern at the Yaquina Head ONA is the lack of a continuous, dedicated facility for pedestrians on Lighthouse Drive between US 101 and the lighthouse. As a result, visitors entering the ONA on foot often walk on the roadway, and near-miss conflicts between vehicles and pedestrians have been observed, especially in areas with limited sight lines. Pedestrians using Lighthouse Drive consist primarily of

local residents, OCT users, and visitors who park at Ernest Bloch Memorial Wayside and walk to the site to avoid paying vehicle entrance fees.

Another challenge is the general lack of connectivity between multimodal facilities surrounding the ONA, such as the Lucky Gap Trail providing access to Agate Beach, a small trail off NW Gilbert Way providing access to Ernest Bloch Memorial Wayside, and the Oregon Coast Bike Route on Oceanview Drive. The TSP outlines several locations in Newport that are in critical need of improvements to pedestrian facilities including the Yaquina Bay area, the OCT, and crossings on US 101. There is a need to address existing gaps in pedestrian facilities, poor connections, vehicle speeds, and safety issues in order to complete the pedestrian system and help make walking a more attractive and efficient travel option in the area. Specific recommendations for pedestrian and bicycle facilities were identified in the TSP and the projects occurring near the Yaquina Head ONA are provided in **Table 3**. Completing these important connections would help expand transportation and recreational opportunities in the area, fill a gap in the existing OCT, and enhance connectivity between Yaquina Head ONA and Yaquina Bay. Currently, the OCT terminates at the beach just north of Yaquina Head ONA and begins again on Agate Beach.

**TABLE 3: RECOMMENDED PROJECTS FOR AGATE BEACH AREA (NEWPORT TSP)**

ID	Location	Description
TR2	<b>US 101 (North)</b> NW Oceanview Dr to North UGB	Construct a shared use path (SUP) on the east side of US 101. Sidewalk infill will also be completed on the west side south of NW 60th Street. SUP project should be consistent with previous planning efforts (e.g., Agate Beach Historic Bicycle/Pedestrian Path, Lighthouse to Lighthouse Path).
TR3	<b>US 101</b> NW Lighthouse Dr to NW Oceanview Dr	Construct a SUP on the west side of US 101, with sidewalk infill on the east side. SUP project should be consistent with previous planning efforts (e.g., Agate Beach Historic Bicycle/Pedestrian Path, Lighthouse to Lighthouse Path).
TR5	<b>NW Lighthouse Drive</b> US 101 to End	Construct a SUP on one side only and other improvements as identified by the BLM/FHWA. Note: pedestrian/bicycle crossing improvements may be needed at the intersection of US 101/NW Lighthouse Drive.
TR7	<b>NW Rocky Way</b> NW 55th St to NW Lighthouse Dr	Construct a SUP and other improvements as identified by BLM/FHWA.
TR8	<b>NW Lighthouse Drive</b> US 101 to terminus	Construct a SUP on one side and other improvements as identified by BLM/FHWA.
CR3	<b>NW 55th Street/US 101</b>	Install an enhanced pedestrian and bike crossing to connect to the SUP on the east side of US 101
BR16	<b>NW 55th Street</b> NW Gladys St to NW Piney St	Install signing and striping as needed to designate a bike route.
SW24	<b>NW 55th Street</b> NW Gladys St to NW Piney St	Complete existing sidewalk gaps.

Source: City of Newport, Transportation System Plan, December 2021.



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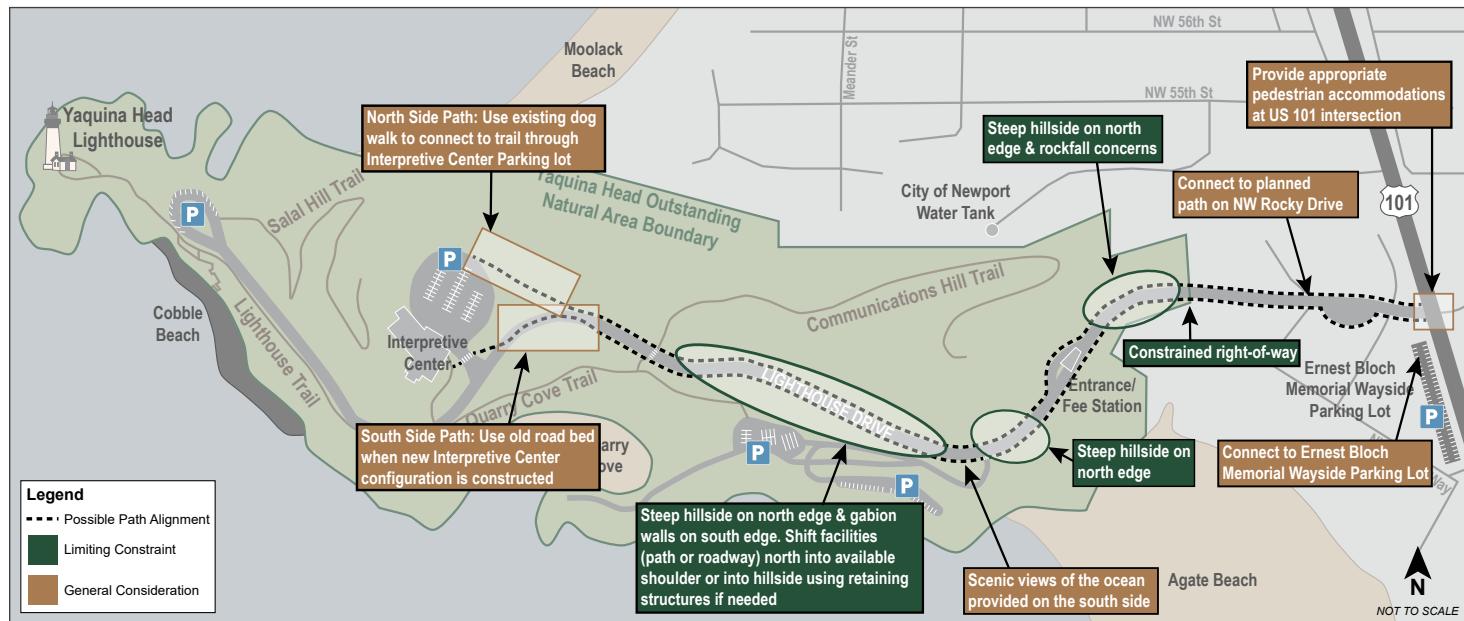
Between the Interpretive Center and the lighthouse, a separated pedestrian path is located on the south side of Lighthouse Drive. The path width varies in some sections but the usable walking surface is generally 8 feet wide with a guardrail barrier separating the path from the roadway. BLM, the City of Newport, and ODOT would like to provide a continuous separated pedestrian facility between US 101 and the lighthouse, similar to the path that exists today. The path would parallel Lighthouse Drive along its entire length, with additional connections between existing trails to provide a continuous and connected route. Coordination with the City of Newport will be required to complete the path between US 101 and the Yaquina Head ONA boundary.

### SHARED USE PATH DEVELOPMENT

One of the primary considerations for developing a separated pedestrian facility will be to determine which side of Lighthouse Drive the path should follow, either the north side or the south side. Due to space constraints, it will be difficult to accommodate a path on both sides of the roadway in most locations. A summary of the constraints and other factors that should be considered when designing and developing the path is provided in **Figure 8**.

There are many factors that may determine which side of the roadway is most appropriate, including available space for roadway widening, existing utilities, connections to other pedestrian facilities and attractions, desirable views from the path, and geotechnical hazards. In some locations, the existing roadway width may be sufficient to accommodate a path with only minor modifications. However, in other locations, significant excavation and installation of retaining structures may be required. Additionally, there may be locations where it may not be feasible or cost-effective to construct an 8-foot-wide path with a barrier as recommended. These constrained locations are shown in **Figure 8**. The most appropriate design of the path, including width, location, and separation type would need to be determined during future design phases.

Without more detailed investigation and design, the cost difference between placing the path on the north versus south side of Lighthouse Drive is unknown. However, construction of a paved 8-foot wide path along Lighthouse Drive from the BLM property boundary to the Interpretive Center is estimated to cost approximately \$600,000. A separated path from the US 101 intersection to the BLM property boundary would be under the jurisdiction of the City of Newport and would be funded separately.



**FIGURE 8: SHARED USE PATH CONSTRAINTS AND OTHER CONSIDERATIONS**

## **NORTH SIDE OF LIGHTHOUSE DRIVE**

Placing the separated pedestrian path on the north side of Lighthouse Drive is generally more feasible in the segment between US 101 and the Yaquina Head entrance station. More space is available for the path without having to considerably shift the roadway alignment. West of the entrance station, the roadway would have to be realigned or the path would have to shift to the south side of the Lighthouse Drive due to a pinch point created by steep side slopes and rocky cliffs. Keeping the path on the north side of the roadway around the perimeter of the entrance station may be a user safety concern due to a history of landslides and rockfall events occurring on the slopes surrounding the north side of the entrance station.

West of the entrance station above the Quarry Cove parking lot, a steep hillside is located on the north side of Lighthouse Drive and a steep drop off is supported by gabion walls on the south side. In this segment, approximately 8 feet of useable shoulder could be reclaimed for a path. Limited space is available for roadway expansion. If expansion is necessary to accommodate the path, the facilities would have to shift into the northern hillside to avoid impacts to the gabion on the south side. Additional retaining structures may be required to maintain structural stability of the hillside.

The path is generally feasible to construct on the north side of Lighthouse Drive for the remainder of the segment to the Interpretive Center, although the alignment may vary based on the improvement option selected for the Interpretive Center parking lot. At the Interpretive Center, the path would shift to its existing location on the south side of the roadway using the pedestrian tunnel under Lighthouse Drive at the Interpretive Center.

A path located on the north side of Lighthouse Drive would lend itself well to complete connections to Communications Hill Trail and to the proposed path on NW Rocky Way from the Newport TSP. However, a crossing at or near the US 101 intersection would be required to facilitate a connection for the Oregon Coast Trail and to other existing and proposed trails leading south of the study area.

## **SOUTH SIDE OF LIGHTHOUSE DRIVE**

Placing the pedestrian path on the south side of Lighthouse Drive would be more technically challenging in the segment between US 101 and the entrance station due to space limitations. The alignment of Lighthouse Drive would likely have to shift to accommodate the path, however, if a second entry lane is added to the entrance station, this realignment would occur anyway. The path would likely be feasible to construct on the south side of Lighthouse Drive for the remaining segment between the entrance station and the Interpretive Center, with the road being shifted north into the hillside in some locations, as discussed previously.

Crossings would occur at the entrance to the host site and at Quarry Cove. The south side alignment would provide direct connections to the Ernest Bloch Memorial Wayside parking lot, Quarry Cove, and existing trails on the south side of Lighthouse Drive without requiring pedestrians to cross the roadway. Additionally, the ocean is on the south side of Lighthouse Drive, so the views from the path would be less obstructed if the path were to be constructed on the south edge of the roadway.



*It is envisioned that a shared use path on Lighthouse Drive would be constructed similarly to the existing Lighthouse Trail with a barrier separating pedestrians from vehicle traffic.*



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### SEPARATION TYPES

The existing Lighthouse Trail is separated from Lighthouse Drive using guardrail. This type of barrier provides physical separation between pedestrians and vehicles, thereby increasing safety and providing a comfortable walking environment. However, it takes up a significant amount of space that could potentially be used to provide a wider pedestrian path. Several other types of separation could be considered instead that can provide an even greater degree of protection, minimize maintenance needs, or maximize the amount of available space for pedestrians.



**Guardrail:** This is the existing barrier in use to separate the pathway. It consists of wood posts mounted in the roadbed with steel sheeting attached to the front of the posts. Installed, guardrail is approximately 1 foot wide and 2 feet tall. The steel sheeting is susceptible to rusting due to environmental elements. Guardrail is typically installed along roadways where hazards exist to protect vehicles. When used as a pedestrian barrier, guardrail provides a significant degree of protection between users.



**Cable Rail:** This type of barrier is already in use at the site, primarily as a barrier between walkways and protected natural areas. The cable rails at Yaquina Head consist of steel posts connected by tension cables. Shapes and sizes of cable rail varies, however, the cable rails already used onsite are approximately 4 feet tall and 2 inches wide. The steel used for the posts and cables can be susceptible to rusting. Depending on the materials used, installation method, and intended use, cable rails may not be designed to withstand impact from vehicles during a crash. Proper deflection distances behind the rails would be necessary.



Source: Lighthouse Bollards & Caps

**Bollards:** Bollards are vertical posts that are often used to control traffic or prevent vehicles from colliding with pedestrians and structures. Bollards can come in many different shapes, sizes, and materials including metal, stone, concrete, or plastic. They can be permanently mounted in the ground or be temporary and portable, such as the bollards used to guide vehicles into the Interpretive Center during peak hours. Flexible, surface-mounted, plastic bollards are presently used at the entrance station to divide opposing lanes of traffic. Standard bollard sizes range from 3 to 6.5 inches wide and are typically 3 feet tall. Bollards should be spaced about 3 to 5 feet apart to allow for pedestrian and wheelchair access but deter the entrance of a vehicle. Concrete or stone bollards are the most sturdy and may require less maintenance over time.



Source: NYCDOT

**Jersey Barrier:** Jersey barriers can be made of either plastic or concrete and are typically 24 inches wide and 32 inches tall. Concrete jersey barriers provide the maximum amount of pedestrian protection but require the most lateral space. Plastic jersey barriers are filled with water to provide crash protection but can be penetrated by fast moving vehicles. Both types are movable with appropriate equipment. Compared to plastic water-filled barriers, concrete jersey barriers are less susceptible to environmental elements and may require less maintenance over time.



Source: Google Earth

**Grade Separation/Curbings:** This type of separation consists of installing the pedestrian path at a specified height above the roadway, typically 4 to 6 inches, much like a sidewalk with curb and gutter. Grade separation maximizes the amount of available space for pedestrians because there is no physical barrier that takes up space laterally. However, this configuration provides the least amount of protection in a crash since there is no physical barrier to absorb impact from a crash.

### 6.1.3. Strategies to Encourage Alternative Transportation

Yaquina Head ONA is most often visited by personal vehicle or by foot. Some visitors also enter the ONA by bus for educational school tours. Few visitors enter by bicycle, and transit options directly to the ONA are limited. The current configuration of the site caters to personal vehicles and offers limited opportunities and accommodations for other modes. In addition to pedestrian treatments discussed in the previous section, several strategies are proposed to encourage the use of alternative transportation modes, such as bicycling, transit, and other environmentally friendly modes. Implementation of these strategies could help alleviate parking capacity concerns, reduce vehicular conflicts, and support BLM's desire to have visitors enjoy the site outside of a vehicle.

#### REGULAR TRANSIT SERVICE



LINCOLN COUNTY TRANSIT

a full loop through Newport each day. City loop buses are wheelchair accessible and are equipped with bicycle racks. At the time of writing, the closest transit stop to Yaquina Head ONA was Bloch Wayside/52nd Street and was provided by request only.

To encourage increased transit ridership and visitation to the site, BLM could consider coordinating with local transit services to provide regular service to the ONA. Consideration should be given to potential pick up and drop off locations and general logistics if buses intend to travel onsite. Potential undesirable delays could be incurred if buses are required to wait in lines at the entrance station during peak visitation hours. Similarly, it may be undesirable to position a bus stop at Lighthouse Drive/US 101 without having dedicated pedestrian facilities to allow transit riders to safely complete the last leg of the journey to the site.

BLM is planning to prepare an updated business plan for the Yaquina Head ONA, in which the site's fee structure will be assessed and potentially modified. If desired, BLM could consider allowing city buses to pick up and drop off riders on site and allow these visitors to access the site without having to pay entrance fees.

#### BICYCLE ACCOMMODATIONS

Bicycles are currently only allowed on paved areas of the site and on the Communications Hill Trail. To support increased use of bicycles at the ONA, additional dedicated bicycle facilities could be provided, including bike racks, bike lockers, and shared-lane markings and signage.

Due to its location on the OCT, Yaquina Head is a popular attraction for trail riders. Providing bike racks at key destinations across the site could help encourage riders to park their bikes and tour the site for longer periods of time. Many of these riders are traveling long distances, so they are often carrying cargo on their bikes and may be hesitant to leave their belongings out of sight for long periods of time. For this reason, it may be desirable to provide several bike racks at all destinations (Quarry Cove, Interpretive Center, lighthouse), or provide bike lockers in a convenient location where riders could drop their gear in a locked box for safe storage.

For riders who are less confident riding with traffic, shared-lane markings (or sharrows) and signage on Lighthouse Drive may also be beneficial for promoting ridership. Shared-lane markings help increase awareness of bicyclists in the roadway by indicating a shared roadway environment for bicycles and vehicles. These markings help encourage bicyclists to position themselves safely in lanes too narrow to comfortably fit a vehicle and bicycle traveling side by side. To further alert drivers to the potential presence of bicyclists, MUTCD bicycle warning signs (W11-1) with share the road supplemental plaques (W16-1) could be used.



Bicycle warning signs (top) and sharrows (bottom) can help increase awareness of bicycles in the roadway.

Electric bicycles or electric-assist bicycles, often called e-bikes, are becoming increasingly popular because they can make biking easier or more comfortable for users. The State of Oregon defines e-bikes as a bicycle with 2 or 3 fully functional pedals equipped with a motor that does not exceed 1000 watts and is designed with a maximum speed of 20 mph. E-bikes are considered a bicycle by the Oregon Vehicle Code and are allowed on any roadway, bike lane, or path that is approved for bicycles but are prohibited from sidewalks. In October 2019, the Department of the Interior



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(DOI) announced Secretary's Order 3376, *Increasing Recreational Opportunities Through the Use of Electric Bikes*, which will allow the use of low-speed electric bicycles on DOI-managed public lands, such as Yaquina Head ONA, where traditional biking occurs. Supporting the use of e-bikes may help increase bike ridership and decrease reliance on personal vehicles at the site.

### **BIKE SHARE PROGRAM/ONSITE BIKE RENTALS**

Some visitors may want to tour the Yaquina Head ONA by bicycle but, due to travel and other constraints, may not have a bike to ride on site. To accommodate these users and reduce vehicular traffic on site, it may be beneficial to develop a bike share program offering short-term bike rentals. A bike share program typically has a station with a payment kiosk where rentals can be paid for and picked up. Each station has several docks (anywhere from 10 to 100+, depending on local traffic volumes) used to store and lock the bikes, although dockless bike share programs are being used in some cities. The system is automated and does not require daily management. Payment systems vary, but can be based on membership structures, hourly usage, or both. The bikes themselves can be branded with recognizable colors or the logos of sponsors.

At Yaquina Head ONA, the bike share program could be internal to the site, with bikes only being available for pick up/drop off at the ONA. However, consideration could be given to coordinating with the City of Newport to provide other bike share stations across the city to expand biking options and encourage fewer vehicular trips. This may be especially beneficial for promoting the Lighthouse to Lighthouse Trail, Oregon Coast Bike Route, and other bicycle activities and attractions. Usually, users don't have to return a particular bike to a specific station. However, this requires program employees to move bikes between stations by truck or trailer to maintain an even distribution of bikes across the system.



Source: City of Asbury Park  
A bike share program could help expand bike ridership on site and across Newport if coordinated with the city.

Bike-share programs, particularly those run by municipalities or nonprofits, may not be entirely user-funded. Some programs tap private individuals or local companies to become station sponsors responsible for maintenance, upkeep, and repairs. Programs might also receive grants from local transportation authorities, municipal governments, or private companies.

### **ONSITE SHUTTLE BUS**

The prospect of a shuttle bus that transports passengers to different locations within the ONA has been proposed in previous conversations with BLM. The concept is intended to reduce vehicular trips at the site, while still allowing passengers to travel by vehicle to primary destinations within the ONA, such as Quarry Cove, the Interpretive Center, and the lighthouse. This would allow visitors to park in the large parking lots at Quarry Cove and/or the Interpretive Center and ride the shuttle to their other destinations. This is beneficial for groups with young children or persons with limited mobility who can't physically walk between destinations. A shuttle system could also help reduce parking needs in constrained locations, such as at the lighthouse.

Several variables should be considered with this scenario. BLM would have to determine whether this service would be provided by BLM staff or an outside company. BLM would also have to consider how the service would be paid for including any user fees associated with the service, the frequency of service, and specific routes.

### **GUIDED TOUR BUS**

As an alternative to an onsite shuttle, BLM could provide a guided tour bus with commentary on the site's history, natural and cultural features, and other important information. If desired, BLM could also coordinate with the Oregon Parks and Recreation Department, Friends of Yaquina Lighthouses, City of Newport, and other organizations/agencies to expand the tour service to other destinations in Newport or on the Oregon Coast. Considerations for a guided tour bus would be similar to those for the onsite shuttle bus.



Source: Lincoln County Transit  
A shuttle bus could be used to decrease personal vehicle trips on site. The bus could also offer guided tours at other Oregon Coast destinations.

## ELECTRIC VEHICLE ACCOMMODATIONS

Oregon is home to one of the largest and most robust networks of electric vehicle fast charging stations in the US. The West Coast Electric Highway is a network of fast charging stations located every 25-50 miles along I-5, Highway 99, and other major roadways in the Pacific Northwest. Travel Oregon is helping develop itineraries on Oregon's Electric Byways that pass by environmentally friendly businesses and key landmarks across the state. Travel Oregon has also partnered with Forth, a non-profit organization dedicated to expanding equitable access to electric transportation, to offer rebates for tourism-related businesses in Oregon that successfully install charging stations.

BLM could consider providing electric vehicle charging stations at the ONA to help boost tourism, encourage environmentally friendly travel practices, and support the adoption of electric vehicle infrastructure across the state. Providing charging stations at the Interpretive Center may also encourage visitors to park and charge their vehicles while they tour the rest of the site on foot.



Source: Seaside, Oregon

Oregon is making great strides in expansion of electric vehicle accommodations across the state. BLM could support this effort by providing a charging station at Yaquina Head ONA while also potentially boosting tourism at the site.

### **6.1.4. Wayfinding Strategies**

Wayfinding refers to information systems that guide people through a physical environment and enhance their understanding and experience of the space. Wayfinding is particularly important in complex and high-stress built environments, such as transportation facilities, and can be developed for both pedestrians and motorists, who each have unique challenges navigating roadway corridors. Comprehensive wayfinding systems often combine signage, maps, symbols, colors, and other communication techniques to help guide visitors to their destinations and reduce confusion.

There are 4 types of wayfinding signs: identification, directional, informational, and regulatory. At Yaquina Head ONA, wayfinding is needed to communicate a variety of information including fee requirements and turnaround options in advance of the entrance station, which lane to get in at the entrance station, directions to key destinations within the site, parking availability at the lighthouse, and walking and biking directions. Signs sharing this type of information already exist at the site, but many of these signs are small, temporary placards requiring staff time to set out and pick up each day. Installing larger permanent signs would reduce staff time and be more prominent to visitors. Wayfinding signs also offer an opportunity to provide signage on site that is cohesive and consistent with BLM/Yaquina Head ONA branding and messaging.

Increasingly, wayfinding systems are integrating with mobile applications, digital displays, and other wireless technologies to communicate with broader audiences. These types of systems could be beneficial to install where dynamic information is valuable, such as at the Interpretive Center to indicate parking availability at the lighthouse. Intelligent transportation systems can be used to detect the number of vehicles entering and exiting the lighthouse circle in order to calculate how many parking spaces are available at a given time. This information could be displayed as vehicles approach the Interpretive Center to encourage visitors to park in the Interpretive Center lot and walk down to the lighthouse, reducing the number of circulating trips at the lighthouse. This would be helpful in communicating to visitors why they are directed into the Interpretive Center lot rather than directly to the lighthouse.



Source: Signal-Tech

BLM uses temporary wayfinding signs (left) for various purposes already; permanent signs with dynamic information displays (right) could help reduce staffing needs.



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### 6.1.5. Pavement Preservation and Maintenance Strategies

Maintenance of transportation facilities accessing Yaquina Head ONA is shared between ODOT, the City of Newport, and BLM. ODOT is responsible for US 101 and Ernest Bloch Memorial Wayside, the City of Newport is responsible for Lighthouse Drive between US 101 and the ONA boundary, and BLM is responsible for all facilities within the ONA boundary. Within the site, the most recent roadway maintenance work, including application of slurry seal, striping, and crack sealing, has been completed by BLM facilities staff. Contracted asphalt work has also been completed in past years. Several roadways within the ONA have experienced continuing pavement failures including transverse and longitudinal cracking and sloughing.

Roadway preservation is a long-term strategy for enhancing functional roadway performance by using integrated, cost-effective maintenance practices that extend roadway life, improve safety and motorist satisfaction, and achieve sustainable roadway conditions. The following sections discuss pavement preservation strategies and maintenance practices that could be implemented at Yaquina Head ONA.

#### OPTIMAL TIMING

Traditionally, federal, state, and local agencies have allowed roadways to deteriorate to “fair” or “poor” condition before steps were implemented to rehabilitate the road. However, recent findings show that this management strategy is both costly and time consuming. Agencies have realized that regularly implementing a series of low-cost preventive maintenance treatments is the most cost-effective way to manage and preserve roadways while also avoiding continual rehabilitation. The most effective roadway preservation strategy consists of implementing planned roadway treatments at the optimum time to address minor deficiencies before they become major failures.

**Figure 9** illustrates this roadway preservation concept with an emphasis on optimal timing. The example compares 2 paved roadways starting at the same condition. One scenario is managed under the traditional approach of rehabilitating the roadway and allowing it to deteriorate to a state of failure. Failure occurs when the road is in fair to poor condition shown by the rehabilitation trigger line. At this line, irreversible structural damage has occurred, resulting in the need for costly rehabilitation of the entire roadway.

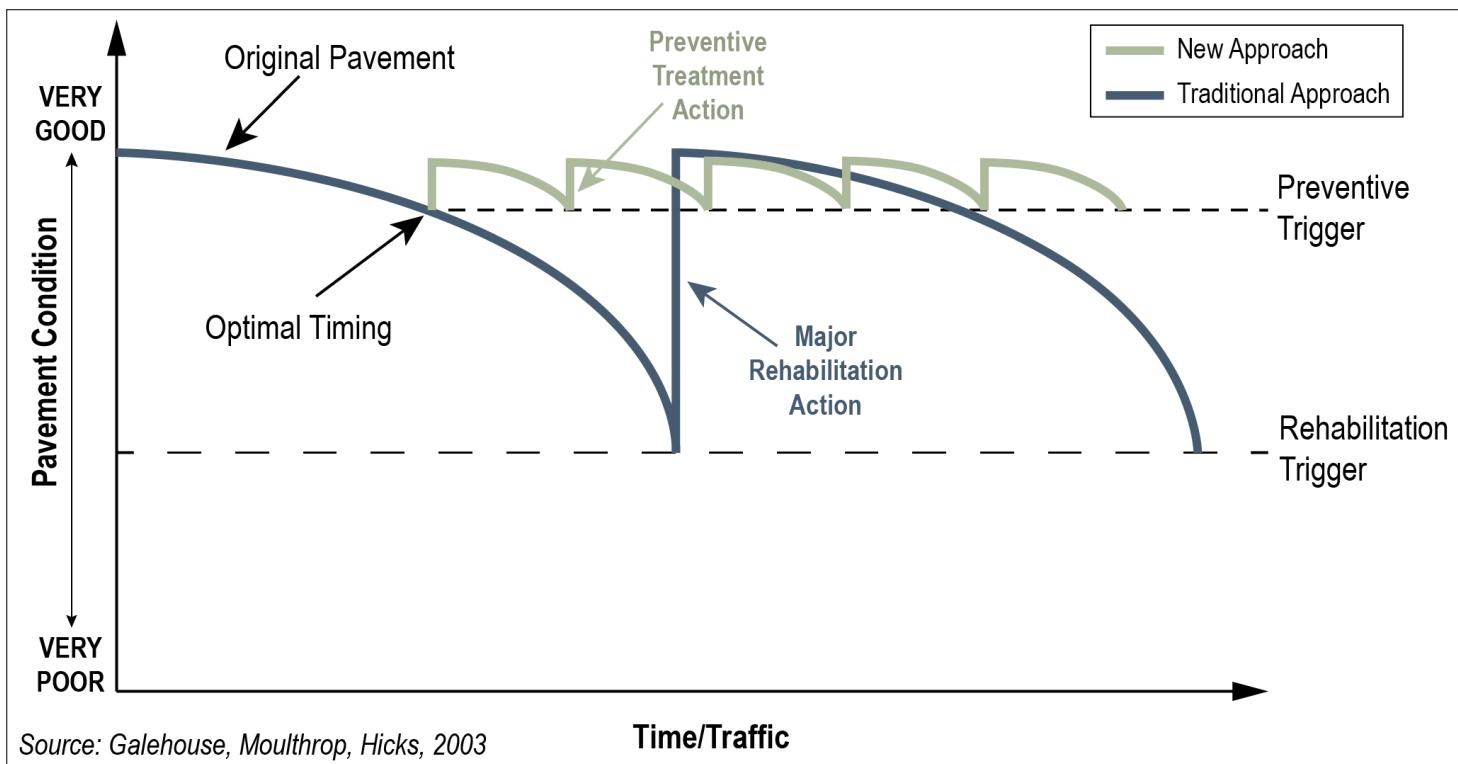
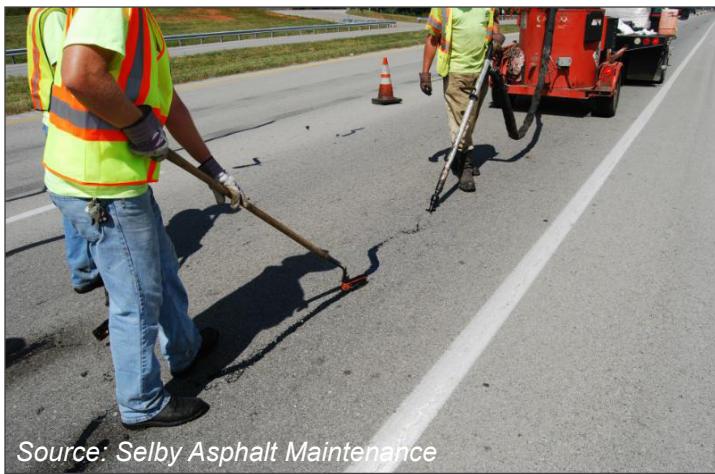


FIGURE 9: OPTIMAL TIMING PAVEMENT PRESERVATION CONCEPT<sup>12</sup>

As shown in **Figure 9**, the new approach scenario implements regular pavement preservation techniques, which are low-cost preventive maintenance treatments implemented when the roadway reaches a predetermined level. The timing of treatment implementation is crucial for the success of the preservation plan. If the treatments are implemented after the optimal time, the roadway will be deteriorating at a rate from which it cannot recover and the investment in maintenance will be wasted. However, if the preventive maintenance is implemented at the optimal time, the roadway will be restored to near original condition, and if routine maintenance continues it will result in much greater intervals between roadway rehabilitations.

### **PREVENTIVE ASPHALT MAINTENANCE ACTIVITIES**

Preventive measures typically include crack sealing, fog seals, chip seals, and/or hot-mix asphalt thin overlays (non-structural). Each of these treatments are most effective when implemented at the optimal time. The optimal application time for each treatment should be established in accordance with the roadway's condition rating and field verification. The expected life of each treatment is dependent on traffic volumes and environmental conditions; however, non-structural overlays typically last the longest, followed by chip seals and crack seals. Chip sealing is the most commonly used treatment in the Pacific Northwest. Microsurfacing, ultrathin bonded wearing course, cape sealing, and cold in-place recycling are other asphalt pavement preservation treatments that have been used by agencies in the region. However, most of the agencies do not regularly use these treatments based on previous performance, costs, and existing roadway conditions.<sup>13</sup>



Source: Selby Asphalt Maintenance

BLM typically performs crack sealing treatments to preserve the pavement at Yaquina Head ONA. Several other methods are used across the state with chip sealing being the most commonly used.

### **DRAINAGE IMPROVEMENTS**

Inadequate drainage is a primary factor in pavement failures. Proper drainage is vital to remove water from roads and maintain a healthy roadway network. A proper drainage system includes the traveled way, shoulders, ditches, and culverts. These elements work together to prevent water from penetrating the road surface. The crown and cross slope of the roadway and shoulder help move water to the roadside so ditches and culverts can carry it away. When water stands on the road it can seep into the road base which saturates and weakens the road strata, causing cracking, rutting, and potholes. It is important to closely monitor roadway drainage and fix any problems immediately.

Maintaining vegetation in ditches is also desirable to provide adequate drainage and prevent erosion. Mowing vegetation and cutting brush is necessary to keep water flowing smoothly. Keeping culverts and other drainage structures free of sediment and debris also helps avoiding road deterioration and flooding.

### **ROUTINE MAINTENANCE ACTIVITIES**

In addition to preventive maintenance activities, non-preventive (or routine) maintenance is also needed to keep the roadway in proper working order. This includes trimming vegetation to maintain driver sight lines, maintenance of road signs and striping, road sweeping and debris removal, litter cleanup, noxious weed control, snow removal, and spot repairs.

### **EMERGENCY MAINTENANCE ACTIVITIES**

Emergency maintenance is typically conducted following an emergency condition such as a landslide or flood event or in response to road failures needing urgent repair. Coastal erosion and landslides are extensive in the area surrounding Yaquina Head. The majority of the ONA is considered to be at moderate to high risk for landslide occurrence. The ONA is also located in a region that is expected to experience very strong to severe shaking in the instance of an earthquake. Landslide and rockfall events have occurred at the site, most recently near the entrance station. The steep rocky cliffs resulting from past quarrying activity at the site and the general geologic composition of the area have made several of the slopes unstable. Landslides, rockfall events, and erosion can cause significant impacts to transportation within the site including blocking travel routes, causing roadway damage, or causing bodily harm to visitors and staff. In the event



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In the past, landslides have occurred on this hillside near the entrance station, blocking traffic and staff exit from the fee booth.

of one of these occurrences, immediate debris removal should be conducted and the need for slope stabilization should be investigated. As a precautionary measure, retaining structures, rockfall barriers, and catchments can be installed to prevent substantial damage should an event occur.

Lighthouse Drive runs adjacent to the coastal floodplain, but the roadway itself lies outside of the floodplain boundary. Some areas of the ONA, including part of Quarry Cove Road, lies within the coastal floodplain boundary. Depending on the severity of a flood event, road washouts and other severe damage could occur. However, the primary impact of flooding is saturation of the road surface which can weaken the asphalt, cause deterioration, and make the asphalt more susceptible to damage such as cracks, deformations, and potholes in the long term. Installing proper drainage and repairing surface deformations when they occur can help minimize the impacts of a flood event and prevent severe damage.

### **6.1.6. Strategies to Accommodate Oversize and Accessible Parking**

The Yaquina Head ONA strives to accommodate a range of user abilities and vehicle types as part of its purpose to support education, scientific study, and public recreation. In addition to standard passenger vehicle parking spaces, each designated parking area at the site provides oversized vehicle parking and accessible parking in compliance with applicable regulations. Considerations relating to parking configurations are discussed in the following sections.

#### **ACCESSIBLE PARKING**

Government entities must provide accessible parking spaces in parking lots in accordance with the 2010 *Americans with Disabilities Act Standards for Accessible Design*.<sup>14</sup> In addition, facilities that provide goods or services to the public have a continuing obligation to remove barriers to accessibility in existing parking facilities.

The required number of accessible parking spaces must be calculated separately for each parking facility, not calculated based on the total number of parking spaces provided at a site. At least 1 in 6 accessible parking spaces (always at least 1) must be designed to be van accessible. Based on the ADA guidelines, summarized in **Table 2** below, all parking lots at Yaquina Head ONA meet or exceed the minimum requirements for ADA parking spaces. Note, small parking lots of 4 or fewer spaces must have accessible spaces, but those spaces do not need to be signed and anyone, regardless of disability status, can park in the accessible space.

**TABLE 4: MINIMUM REQUIRED ACCESSIBLE PARKING SPACES**

Total Number of Parking Spaces Provided in Parking Facility	Minimum Number of Accessible Parking Spaces (Car and Van)	Minimum Number of Van-Accessible Parking Spaces (1 in 6 Accessible Spaces)
1 to 25	1	1
26 to 50	2	1
51 to 75	3	1
76 to 100	4	1
101 to 150	5	1
151 to 200	6	1

Source: 2010 ADA Standards for Accessible Design



ADA-accessible parking stalls are provided in all parking lots at Yaquina Head ONA; an increased number of ADA stalls is desired.

Accessible parking spaces must be located on the shortest accessible travel route to an accessible entrance. Where buildings have multiple accessible entrances, the accessible parking spaces must be dispersed and located closest to the accessible entrances. An accessible route, without curbs or stairs and at least 3 feet wide, must always be provided from the accessible parking to the accessible entrance.

Accessible parking spaces are 8 feet wide while van-accessible spaces are 11 feet wide. Access aisles provide room for individuals to deploy vehicle-mounted wheelchair lifts and/or unload and use mobility devices such as wheelchairs or walkers. Aisles should be provided on both sides of an accessible space and should be 5 feet wide for both standard and van-accessible spaces. It is permissible for the aisles to be shared between 2 adjacent spaces. Access aisles must be marked (e.g., painted with hatch marks) to discourage parking in them. An alternate design allows a van-accessible space to be 8 feet wide if the adjacent access aisle is also 8 feet wide. Minimum stall lengths are not provided in the 2010 ADA Standards, but BLM guidance suggests a standard length of 20 feet.<sup>15</sup>

Accessible parking spaces must also be identified by signs that include the International Symbol of Accessibility. Signs at van-accessible spaces must include the additional phrase “van-accessible.” Signs should be mounted so that the lower edge of the sign is at least 5 feet above the ground to ensure visibility by both drivers and local enforcement officials.

ADA Standards do not prohibit front-in only, back-in only, or angled accessible parking spaces. However, where van-accessible spaces are angled, the standards require the access aisle to be located on the passenger side

(where vehicle ramps and lifts are typically deployed). Since users pull in or back in depending on which side the access aisle is needed, it is advisable to design both standard and van-accessible spaces so that they can be entered in either direction. Otherwise, consider providing 1 access aisle at each regular accessible space instead of allowing 2 adjacent spaces to share an aisle so that access is available on both sides.

## RV PARKING

RV sizes vary considerably but typically range between 20 and 50 feet in length. RV parking spaces are also variable depending on the type and purpose of the parking space. For example, RV parking spaces in campgrounds are often much longer and wider to accommodate the activities that accompany camping, such as picnicking and grilling. RV stalls in RV parks are similar but must be at least 20 feet wide to comply with fire codes. When parking lots provide designated RV parking, stalls are often large enough to accommodate most RV sizes. Most RV parking spaces are a minimum of 20 feet wide and 40 feet long while a standard vehicle parking space is generally 9 feet by 18 feet long. Where designated RV parking is not provided, some RVs will be able to fit in a standard parking space, while larger models will need to take up multiple spaces.

The number of RV parking spaces needed in a parking lot varies based on site and facility needs. There are no requirements or standard guidance available. Input from BLM staff suggests that on the busiest day at the site, 7 to 8 RV stalls are needed in the Interpretive Center parking lot to accommodate demand. There are currently only 3 RV stalls in the Interpretive Center parking lot. On busy days, RVs have been observed parking on the outer edge of the parking lot partially blocking through traffic.



Angled RV parking stalls are provided at lighthouse circle. An irregularly shaped RV/Bus lane is also provided. Both are often occupied by personal vehicles during peak visitation times.



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Spaces designed for RVs and trailers are not exempt from accessibility coverage, but the 2010 ADA standards do not include technical provisions specific to these spaces. Accessible RV or trailer spaces may be located among other RV or trailer spaces so long as they are on the shortest accessible route to nearby facility entrances. Access aisles serving accessible spaces must be as long as the vehicle space they serve.

The *Architectural Barriers Act Standards*<sup>16</sup> apply to facilities designed, built, altered, or leased with federal funds. Yaquina Head ONA is subject to compliance with these standards. The standards include provisions for RV parking and pull-up spaces at outdoor developed areas on federal lands such as camping and picnic facilities. The standards specify that parking spaces and pull-up spaces for recreational vehicles shall be a minimum of 20 feet wide except where 2 adjacent RV parking spaces are provided, when 1 parking space may be a minimum of 16 feet wide.

### 6.1.7. Management Strategies

Yaquina Head ONA is managed by several BLM staff, including both year-round and seasonal workers, and volunteer site hosts. The staff manage the entrance station, educational tours, the Interpretive Center, and the general park operations. The site hosts provide support to BLM staff and work various shifts at the tidepools, lighthouse, and Interpretive Center or wherever needed. The following strategies are proposed to help manage the site efficiently during day-to-day operations, peak visitation periods, and emergency situations.

#### ENTRANCE STATION MANAGEMENT

The Yaquina Head entrance station is presently managed by BLM staff. Between 1 to 2 rangers are stationed in the fee booth during park hours to greet visitors, check and issue passes, manage ADA clickers for Quarry Cove, track visitor entry numbers, and collect cash payments. Visitors paying by credit card are directed to an AFM kiosk located just to the west of the main booth. During peak visitation periods, BLM staff conduct "line busting" which involves standing in live traffic between traffic cones and directing pass holders to proceed to the left side of the booth through 1 of the lanes typically used for outbound traffic.

To expedite visitor processing time, a second fee station with a second entry lane is recommended. It is envisioned that 1 or both of the new stations would be equipped with a credit card kiosk and a barrier gate with an automatic arm to allow the second station to operate automatically during

peak periods. At the time of writing, BLM staff were unable to collect and process credit card payments without a self-serve AFM. In the future, however, it is expected that BLM staff could either process credit card payments in the fee booth or install an AFM in the entry lane to allow visitors to pay by credit card without having to park and get out of their vehicle at the self-serve kiosk. It is also envisioned that pass holders may be able to scan their pass, with the automated barrier gate immediately allowing entry into the site.

With these modifications, it is expected that processing times would be shortened considerably and standing queues would be much smaller. The addition of a second booth would also provide more space for queues to build without having to extend down the city-owned portion of Lighthouse Drive. Both fee booths could be designed to operate fully automatically, however, it is desirable to BLM to have a booth staffed by at least 1 staff member so they can greet and orient visitors to the site, as this is sometimes the only contact rangers have with visitors. Staff also like to be present to issue ADA clickers and talk with visitors as they leave the site.

The entrance station is also equipped with in-ground loop conductors for traffic monitoring purposes. BLM uses vehicle counts from the loops to track the number of visitors to the site each day. Staff also manually track recreational vehicles versus non-recreational vehicles (BLM staff, delivery vehicles, utility and maintenance vehicles, contractors, and other non-visitor vehicles), pedestrians, bicycles, buses, and pass status. This data is used to track visitation at the site for planning and management purposes. It is desirable to keep some level of automatic visitation data either through loop conductors, radar, video, or other system.



Source: NRB Modular Solutions

An automated fee booth with attached credit card kiosk and automatic barrier arm could help expedite visitor entry times.

## **EMERGENCY MANAGEMENT**

When improving the site, it is important to consider and address emergency transportation issues, both for small-scale and large-scale emergencies. In the event of a small-scale emergency, such as the need for immediate medical attention or a building fire, easy and efficient access by emergency vehicles will be critical. As discussed under the site-specific improvements (**Section 6.2**), access by emergency vehicles was considered with each potential improvement option. All preferred concepts would be designed to accommodate oversize emergency vehicles, such as pumper and ladder trucks, and would also allow more direct access by emergency vehicles in emergency situations. For example, the new circulation pattern at the Interpretive Center would allow emergency vehicles to travel the shortest path through the parking lot and not require them to circulate around the entire outside edge of the lot. Additionally, installing a second entry lane into the site would help create additional space for vehicles to pull over so an ambulance or other emergency vehicle could enter the site more quickly. However, installing a pedestrian path along the entirety of Lighthouse Drive may use up the space previously dedicated for roadway shoulders that could be used in emergency situations. When the roadway is reconstructed, consideration should be given to whether additional shoulder space is needed for vehicles to pull over in emergency situations, or if the sporadic turnouts along Lighthouse Drive are sufficient.

Lincoln County's *Multi-Jurisdictional Natural Hazards Mitigation Plan*<sup>17</sup> provides resources, information, and mitigation strategies for reducing risk of disaster and long-term effects resulting from natural hazards. The plan notes that the area around Yaquina Head and Moolack Beach is particularly vulnerable for coastal erosion and, because of its role in defining and supporting the community, the Yaquina Head Lighthouse is identified as an important historic resource to protect from the impact of disasters. Due to its elevation, almost the entire ONA is outside the hazard area for a tsunami resulting from an earthquake. However, the Quarry Cove ADA access road is within the hazard area for both a local and distant tsunami. Emergency evacuation for Quarry Cove visitors, especially disabled visitors, should be considered.

Source: *The Columbian*



*Preparation of an evacuation plan can help with rescue efforts during a large scale emergency.*

In the event of a natural disaster such as wildfire, earthquake, or tsunami, emergency evacuation is particularly challenging at Yaquina Head ONA with Lighthouse Drive being the only ingress/egress route. BLM would have to consider how visitors and staff should evacuate the site, whether by foot, by vehicles, or both. Typically, evacuation on foot is preferred to reduce traffic congestion that could delay or prohibit evacuation. A mix of vehicles and pedestrians in the constrained space of Lighthouse Drive could be potentially dangerous. Installation of a pedestrian path along the entire length of Lighthouse Drive could help alleviate some concerns. Advertising the evacuation plan and evacuation routes for the site through wayfinding signs could also be beneficial. The Ernest Bloch Memorial Wayside parking area is the closest designated assembly area to the ONA.

### ***6.1.8. Summary of Sitewide Improvement Strategies***

**Table 5** on the following page presents a summary of the strategies discussed in the previous sections.



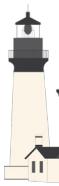
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**TABLE 5: SITEWIDE IMPROVEMENT STRATEGIES**

Strategy/Option	Advantages	Disadvantages	Other Considerations
<b>TRAFFIC CALMING STRATEGIES</b>			
Lower Posted Speed Limit	<ul style="list-style-type: none"> <li>Lower vehicle speeds may be more comfortable for pedestrians walking along the roadway</li> </ul>	<ul style="list-style-type: none"> <li>Lower speed limit may not be well observed by visitors</li> <li>Would require enforcement to be effective</li> </ul>	<ul style="list-style-type: none"> <li>Consistent speed limits throughout the site would likely be better observed</li> <li>Engineering judgment should be used to set the speed limit if not using the 85<sup>th</sup> percentile speed</li> </ul>
Speed Feedback Signs	<ul style="list-style-type: none"> <li>May encourage visitors to observe posted speed limits</li> </ul>	<ul style="list-style-type: none"> <li>Additional signage may contribute to information overload</li> <li>Would require enforcement to be effective</li> </ul>	<ul style="list-style-type: none"> <li>Can become less effective over time for regular site visitors</li> </ul>
Warning Signs	<ul style="list-style-type: none"> <li>Could help reduce vehicle speeds if placed appropriately</li> <li>Could help increase awareness of pedestrians/bicycles near the roadway</li> </ul>	<ul style="list-style-type: none"> <li>Additional signage may contribute to information overload and detract from natural setting</li> </ul>	<ul style="list-style-type: none"> <li>Consider appropriate placement and number of signs throughout site</li> </ul>
Speed Bumps, Humps, and Tables	<ul style="list-style-type: none"> <li>Physical obstruction forces drivers to slow down</li> <li>May improve safety and reduce speeds at pedestrian crossings</li> </ul>	<ul style="list-style-type: none"> <li>May be frustrating to visitors</li> <li>Increased maintenance required</li> <li>Can cause damage to vehicles</li> <li>May impact emergency vehicle access within the site</li> </ul>	<ul style="list-style-type: none"> <li>Consider placement for maximum effectiveness</li> <li>Consider pavement markings and signage to ensure visibility</li> </ul>
Narrow Travel Lanes	<ul style="list-style-type: none"> <li>May encourage drivers to slow down</li> <li>Reduces exposure and crossing distances for pedestrians</li> </ul>	<ul style="list-style-type: none"> <li>May be difficult for trucks, RVs, and buses to maneuver tight curves</li> </ul>	<ul style="list-style-type: none"> <li>Consider reallocation of roadway travel lanes to be used for pedestrian facilities</li> </ul>
Lateral Shifts and Chicanes	<ul style="list-style-type: none"> <li>May encourage drivers to slow down</li> <li>Chicanes typically achieve a greater speed reduction than lateral shifts</li> </ul>	<ul style="list-style-type: none"> <li>Less effective where traffic volumes are higher in 1 direction or where likelihood of encountering opposing vehicle is low</li> <li>Increased maintenance required</li> </ul>	<ul style="list-style-type: none"> <li>Consider medians to ensure vehicles do not cross centerline</li> <li>Consider emergency vehicle access such as mountable medians</li> </ul>
<b>PEDESTRIAN ACCOMMODATION STRATEGIES</b>			
Path on North Side of Lighthouse Drive	<ul style="list-style-type: none"> <li>Provides an easier connection to the TSP-proposed NW Rocky Way path</li> <li>Wouldn't have to shift roadway alignment significantly to accommodate path between US 101 and entrance station</li> </ul>	<ul style="list-style-type: none"> <li>Path or roadway would likely have to shift south after entrance station due to limited available space</li> <li>Potential user safety concern due to landslides and rockfall on north side cliffs</li> <li>Farther from desirable ocean view</li> </ul>	<ul style="list-style-type: none"> <li>Consider appropriate crossing locations to facilitate connections to Ernest Bloch Memorial Wayside, the OCT, and other pedestrian facilities</li> </ul>
Path on South Side of Lighthouse Drive	<ul style="list-style-type: none"> <li>Provides an easier connection to existing pedestrian facilities within the ONA</li> <li>Closer to desirable ocean views to the south</li> </ul>	<ul style="list-style-type: none"> <li>Lighthouse Drive would have to be shifted north to accommodate path on south side between US 101 and entrance station</li> </ul>	<ul style="list-style-type: none"> <li>Consider appropriate crossing locations to facilitate connections to NW Rocky Way and other pedestrian facilities outside the ONA</li> </ul>
Separation Types	<ul style="list-style-type: none"> <li>Guardrail and cable rails match the existing infrastructure onsite</li> <li>Jersey barriers provide the maximum degree of pedestrian protection</li> <li>Bollards can be fixed or temporary depending on site needs</li> </ul>	<ul style="list-style-type: none"> <li>Metal and plastic barriers are more susceptible to deterioration from environmental elements and require more maintenance over time</li> <li>Jersey barriers and guardrail require the most lateral space</li> </ul>	<ul style="list-style-type: none"> <li>Consider which separation type best balances protection for pedestrians, aesthetics, maintenance needs, and usable pedestrian space</li> </ul>
<b>STRATEGIES TO ENCOURAGE ALTERNATIVE TRANSPORTATION</b>			
Regular Transit Service	<ul style="list-style-type: none"> <li>May help boost tourism</li> <li>Could reduce parking needs if highly used</li> <li>Could potentially be accommodated through Lincoln County Transit</li> </ul>	<ul style="list-style-type: none"> <li>May not be profitable if ridership is low</li> </ul>	<ul style="list-style-type: none"> <li>Consider location of rider drop off; consider potential delays caused by waiting in entrance station queue to ONA; consider pedestrian connections outside ONA</li> </ul>

Strategy/Option	Advantages	Disadvantages	Other Considerations
STRATEGIES TO ENCOURAGE ALTERNATIVE TRANSPORTATION (CONTINUED)			
Bicycle Accommodations	<ul style="list-style-type: none"> <li>May help increase bicycle use onsite and encourage visitation by OCT users</li> <li>Shared lane markings help increase awareness of bicyclists in roadway</li> </ul>	<ul style="list-style-type: none"> <li>Additional signage for shared lanes may contribute to information overload</li> </ul>	<ul style="list-style-type: none"> <li>Consider best location for bike racks or bike lockers</li> <li>Consider how e-bikes are best accommodated within existing laws</li> </ul>
Bike Share Program/Onsite Bike Rentals	<ul style="list-style-type: none"> <li>May help boost tourism</li> <li>If implemented in coordination with the city, could help reduce vehicular use and parking demands</li> <li>Environmentally friendly option for traveling through the ONA</li> </ul>	<ul style="list-style-type: none"> <li>Can be costly; fees passed on to users may not be desirable, especially if compounded with site entrance fees</li> <li>Helmets are generally not provided, which can be a safety concern</li> </ul>	<ul style="list-style-type: none"> <li>Consider partnering with the City of Newport to provide expanded biking options</li> <li>Consider where bike share stations would be located and who would maintain distribution of bikes across the system</li> </ul>
Onsite Shuttle Bus	<ul style="list-style-type: none"> <li>Visitors could park and ride the shuttle bus to other onsite destinations, reducing parking needs at other locations</li> <li>Beneficial for groups with young children or disabled persons</li> </ul>	<ul style="list-style-type: none"> <li>May be cost prohibitive, expenses include purchase, maintenance, and operations of buses as well as staffing needs</li> </ul>	<ul style="list-style-type: none"> <li>Consider how the shuttle would be funded (user fees, grant, etc.)</li> </ul>
Guided Tour Bus	<ul style="list-style-type: none"> <li>May help boost tourism</li> <li>Could reduce parking needs if highly used</li> <li>Information provided by tour guide could help enhance the visitor experience</li> </ul>	<ul style="list-style-type: none"> <li>May not be profitable if ridership is low</li> </ul>	<ul style="list-style-type: none"> <li>Consider partnering with other jurisdictions to provide a guided tour along the Oregon Coast</li> </ul>
Electric Vehicle Accommodations	<ul style="list-style-type: none"> <li>Supports Oregon's desire for electric vehicle adoption across the state</li> <li>Environmentally friendly option for traveling through the ONA</li> </ul>	<ul style="list-style-type: none"> <li>If electric vehicle charging station is located outside of ONA, or not well-advertised, may not boost tourism on site</li> </ul>	<ul style="list-style-type: none"> <li>Consider location of electric vehicle charging stations for maximum use</li> </ul>
WAYFINDING STRATEGIES			
Wayfinding Strategies	<ul style="list-style-type: none"> <li>Help guide visitors throughout the site and reduce confusion</li> <li>Reduce staffing needs to set out temporary signs</li> <li>Technologically integrated signs can display information in real time</li> </ul>	<ul style="list-style-type: none"> <li>Additional signage may contribute to information overload</li> <li>Dynamic signs may require increased maintenance and utility needs</li> </ul>	<ul style="list-style-type: none"> <li>Opportunity to enhance Yaquina Head ONA branding/messaging</li> </ul>
PAVEMENT PRESERVATION AND MAINTENANCE STRATEGIES			
Optimal Timing	<ul style="list-style-type: none"> <li>Most cost-effective way to manage and preserve roadways</li> <li>Extends service life</li> <li>Fixes minor deficiencies before they become failures</li> </ul>	<ul style="list-style-type: none"> <li>If treatments are not implemented at the optimal time, previous maintenance investments will be wasted</li> </ul>	<ul style="list-style-type: none"> <li>Development of a pavement preservation plan will help ensure treatments are completed regularly and at the optimal time</li> </ul>
Preventive Asphalt Maintenance Activities	<ul style="list-style-type: none"> <li>Treatments are most effective when implemented at the optimal time</li> <li>Chip sealing is the most common preventive technique in the Pacific Northwest</li> </ul>	<ul style="list-style-type: none"> <li>The expected life varies based on traffic volumes and environmental conditions</li> </ul>	<ul style="list-style-type: none"> <li>Other pavement preservation techniques can be used but effectiveness and appropriateness may vary based on cost and existing roadway conditions</li> </ul>
Drainage Improvements	<ul style="list-style-type: none"> <li>Proper drainage prevents water from penetrating the roadbed, preserving the pavement</li> </ul>	<ul style="list-style-type: none"> <li>Inadequate drainage is a primary factor in pavement failures</li> </ul>	<ul style="list-style-type: none"> <li>Proper vegetation maintenance prevents erosion and flooding and helps provide adequate drainage</li> </ul>
Routine Maintenance Activities	<ul style="list-style-type: none"> <li>Help keep the roadway in proper working order and are beneficial for operations and safety</li> </ul>	<ul style="list-style-type: none"> <li>Staff time is required to complete maintenance duties on a regular basis</li> </ul>	<ul style="list-style-type: none"> <li>Developing a maintenance plan will help ensure all routine maintenance activities are completed regularly</li> </ul>
Emergency Maintenance Activities	<ul style="list-style-type: none"> <li>Precautionary measures can help prevent substantial damage when an emergency occurs</li> </ul>	<ul style="list-style-type: none"> <li>Typically conducted in response to an emergency condition or catastrophic failure</li> </ul>	<ul style="list-style-type: none"> <li>Conduct site analysis to determine where vulnerabilities occur and the most appropriate preventive measures</li> </ul>



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Strategy/Option	Advantages	Disadvantages	Other Considerations
<b>STRATEGIES TO ACCOMMODATE ONSITE AND ACCESSIBLE PARKING</b>			
Accessible Parking	<ul style="list-style-type: none"> <li>Designated parking locations ensure key site attractions are accessible to disabled individuals</li> <li>Providing a minimum number of ADA-accessible parking spaces is required under federal regulations</li> </ul>	<ul style="list-style-type: none"> <li>The minimum number of ADA stalls may not be sufficient at the ONA due to historic visitor needs and trends</li> <li>Designating more than the minimum number of ADA stalls reduces available parking for other visitors.</li> <li>During times of high visitation, enforcement may sometimes be needed to ensure ADA parking designations are respected.</li> </ul>	<ul style="list-style-type: none"> <li>Assess the appropriate number and placement of ADA parking spaces for each parking area</li> <li>Assess accessible routes from ADA parking to buildings</li> </ul>
RV Parking	<ul style="list-style-type: none"> <li>Designated RV locations minimize inappropriate parking throughout the site and facilitate turning maneuvers for larger vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>There is no standard guidance available for the number of RV stalls needed</li> <li>RV stalls are not exempt from accessibility standards but there are no specific technical provisions</li> <li>Due to their length, visitors may treat RV parking stalls as travel lanes</li> </ul>	<ul style="list-style-type: none"> <li>Determine the appropriate number of RV stalls based on historic visitor trends</li> </ul>
<b>MANAGEMENT STRATEGIES</b>			
Entrance Station Management	<ul style="list-style-type: none"> <li>A second fee booth and entry lane would help expedite processing times and should eliminate the need for "line busting"</li> </ul>	<ul style="list-style-type: none"> <li>Automated fee booths would reduce staff communication with visitors</li> </ul>	<ul style="list-style-type: none"> <li>Consider the best method(s) for monitoring visitation data</li> </ul>
Emergency Management	<ul style="list-style-type: none"> <li>Site-specific improvements will be designed to accommodate oversized emergency vehicles</li> <li>Advertising the site's evacuation plan and evacuation routes with wayfinding signs can be beneficial</li> </ul>	<ul style="list-style-type: none"> <li>Emergency evacuation is particularly challenging since Lighthouse Drive is the only ingress/egress route</li> <li>Quarry Cove ADA access road is within the tsunami hazard area, and evacuation for Quarry Cove visitors, especially disabled visitors, should be considered</li> </ul>	<ul style="list-style-type: none"> <li>Developing an evacuation plan can help visitors and staff know how to evacuate in an emergency</li> </ul>

## 6.2. SITE-SPECIFIC IMPROVEMENTS

This section contains descriptions and performance summary of preferred configurations intended to address identified conflict points and areas of concern at the entrance station, Quarry Cove, Interpretive Center, and lighthouse. The preferred configurations reflect input from stakeholders and the public, staff feedback, information gathered from an evaluation of the existing and projected conditions of the study area, and a planning-level feasibility analysis. The preferred configurations are intended to address the identified needs and objectives defined for the Yaquina Head ONA.

### 6.2.1. Alternatives Analysis Process

Initially, a range of possible alternatives were prepared for consideration by BLM and the OC. After review and input, the configurations were revised and analyzed based on criteria including management and maintenance, traffic and safety performance, environmental impacts, geotechnical feasibility, and overall constructibility. The revised concepts and an analysis of advantages and disadvantages of each option according to the criteria were presented to BLM staff for additional input. The study team then conducted a site visit to identify any constraints or barriers that may limit the feasibility of an option. Through the site visit and coordination with BLM and FHWA staff, preferred configurations were identified for each of the four site-specific locations. The preferred configurations were determined to best balance competing needs, interests, and perspectives while also minimizing overall impacts and cost. The preferred configurations reflecting confirmation of site conditions are presented in this chapter. A description of each preferred configuration, performance evaluations, potential impacts, cost estimates, overall feasibility, and potential constraints are provided in the following sections. The options that were considered but not advanced can be found in **Appendix C**.

### DESCRIPTION

A description of the preferred configuration and associated traffic flow are provided. Images showing a conceptual design of the preferred configuration, anticipated impacts resulting from construction, and traffic circulation patterns are also provided.

### MANAGEMENT/MAINTENANCE

Each concept was reviewed from a staff management perspective addressing topics such as staffing and staff transportation needs, enforcement needs, emergency management, and general site management implications. To keep the site's transportation facilities operating safely and efficiently for visitors, various upgrades, repairs, or maintenance activities may also be necessary. An evaluation of maintenance needs and requirements was another consideration for each concept.

### TRAFFIC PERFORMANCE

A high-level evaluation of traffic performance was performed for each concept. The evaluation included an analysis of circulation patterns and turning movements, access needs, and connectivity for vehicles and non-motorized users. The ability of each option to accommodate large vehicles, including emergency vehicles, was also considered. Overall operational performance of each option was also a factor, including vehicle processing times, queue storage, and general congestion. Additionally, a parking capacity analysis was performed to determine if the proposed option provided adequate ADA, RV, and standard parking stalls based on visitation needs and intended use of each parking lot.

### SAFETY PERFORMANCE

Speeds, unsafe driver behavior, and non-motorist protection were identified as primary safety concerns at the site. Safety performance was assessed through a high-level evaluation analysis of potential vehicle conflict areas, pedestrian conflict areas, accessibility, and general user safety. The potential for unsafe driving behavior, including bypass maneuvers and speeding, was also evaluated.

### ENVIRONMENTAL IMPACTS

To preserve the ONA, it is important to BLM, stakeholders, and visitors to minimize the amount of new pavement required for improvements and provide additional vegetation wherever feasible. Likewise, it is important to minimize temporary and permanent environmental impacts from construction. Potential notable environmental impacts are listed for each option. If improvements are advanced for implementation, detailed analysis would be required during the project development process to quantify specific resource impacts and identify associated permits, laws, regulations, and mitigation requirements that may apply.



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### GEOTECHNICAL FEASIBILITY AND OVERALL CONSTRUCTIBILITY

A planning-level field analysis was performed to determine the geotechnical feasibility of each option. Existing conditions such as steep hillsides, rocky cliffs, utilities, and right-of-way were evaluated and considered for potential constraints to feasibility and overall constructibility of each concept. Further field studies would be required for any concept advanced into future project development phases to determine design details and feasibility.

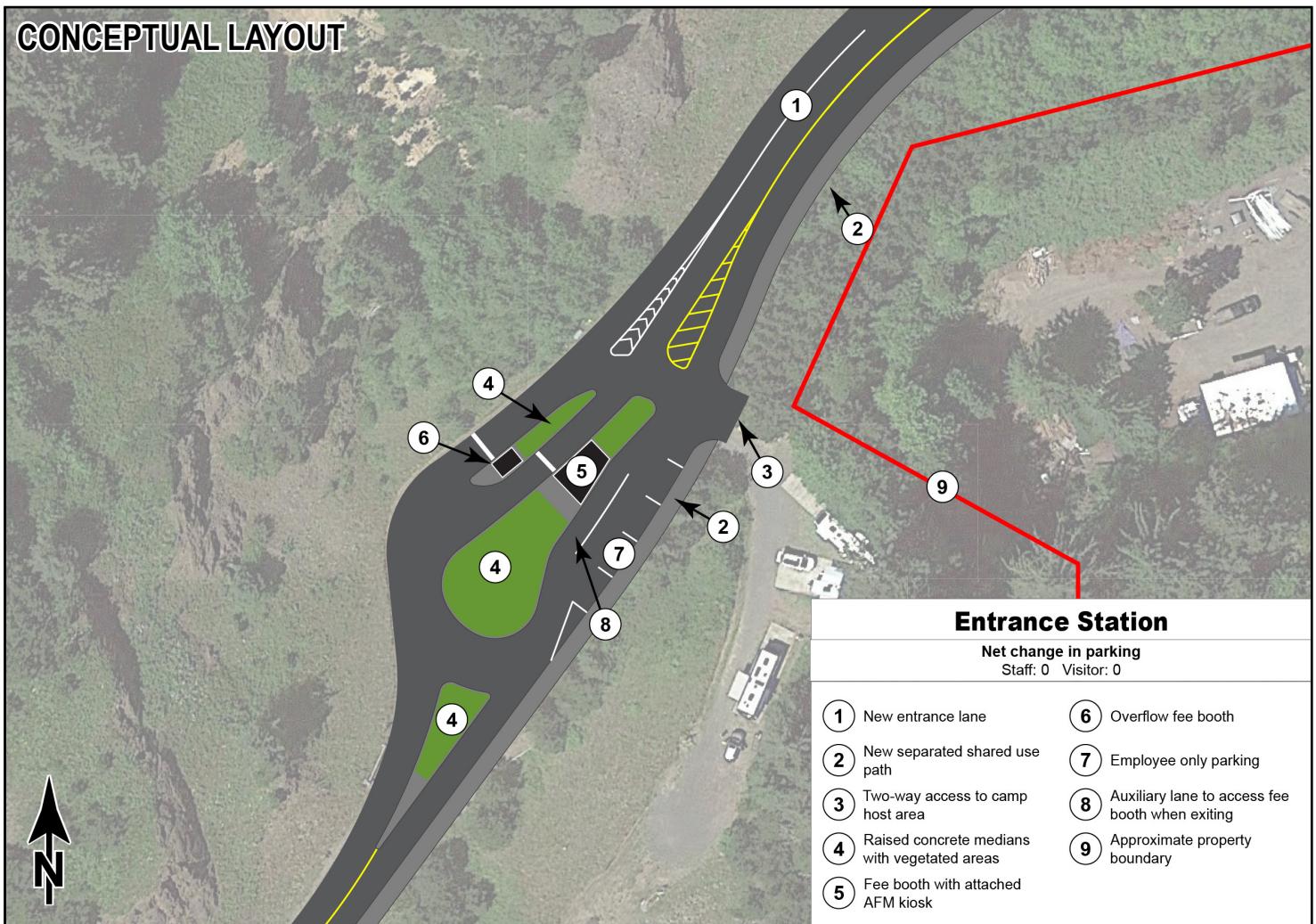
### ESTIMATED COST

Planning-level cost estimates were developed for each preferred configuration. The estimates include costs for construction engineering, preliminary engineering, traffic control, and mobilization. A general contingency to account for unknown factors and anticipated project development risk level was also included in the cost estimates for all configurations. The estimates are presented in 2022 dollars and can be expected to increase with inflation depending on the anticipated future year of expenditure. **Appendix D** contains planning-level cost estimates for each of the preferred configurations presented.



## ENTRANCE STATION PREFERRED CONFIGURATION

### CONCEPTUAL LAYOUT



### DESCRIPTION:

In this configuration the entrance station would remain in its existing location. Some roadway expansion would be necessary to provide a second entrance lane with a secondary fee booth. It is envisioned that one or both of the new entrance stations would be equipped with a credit card kiosk and a barrier gate with an automatic arm. An auxiliary exit lane would be provided to allow visitors to stop at the fee booth to talk to the ranger or return an ADA clicker. A SUP would also be constructed on one side of Lighthouse Drive beginning at the US 101 intersection and continuing westward onto the site. In the preferred configuration, the path is shown on the south side due to desirable views and separation from an active landslide area on the north side of the entrance station. Placement of the path could be pursued on the north side if constructability or other issues were identified to the south during design.

### MANAGEMENT/MAINTENANCE:

The second entry lane with automated fee booth would provide flexibility based on staffing capacity. During the off season, one lane could be closed or automated to reduce staffing needs. The second lane would also diminish the need for staff to stand in the roadway to conduct line busting. Four staff parking stalls are anticipated to be sufficient during the typical day. An auxiliary exit lane is provided to allow visitors to stop at the fee booth to talk to the ranger or return an ADA clicker. The entrance to the camp host area is designed to allow easy access by RVs and easy turnarounds by staff with large vehicles. Increased maintenance would be required for the SUP on Lighthouse Drive.

### ESTIMATED COST:

\$1.9M - \$2.3M

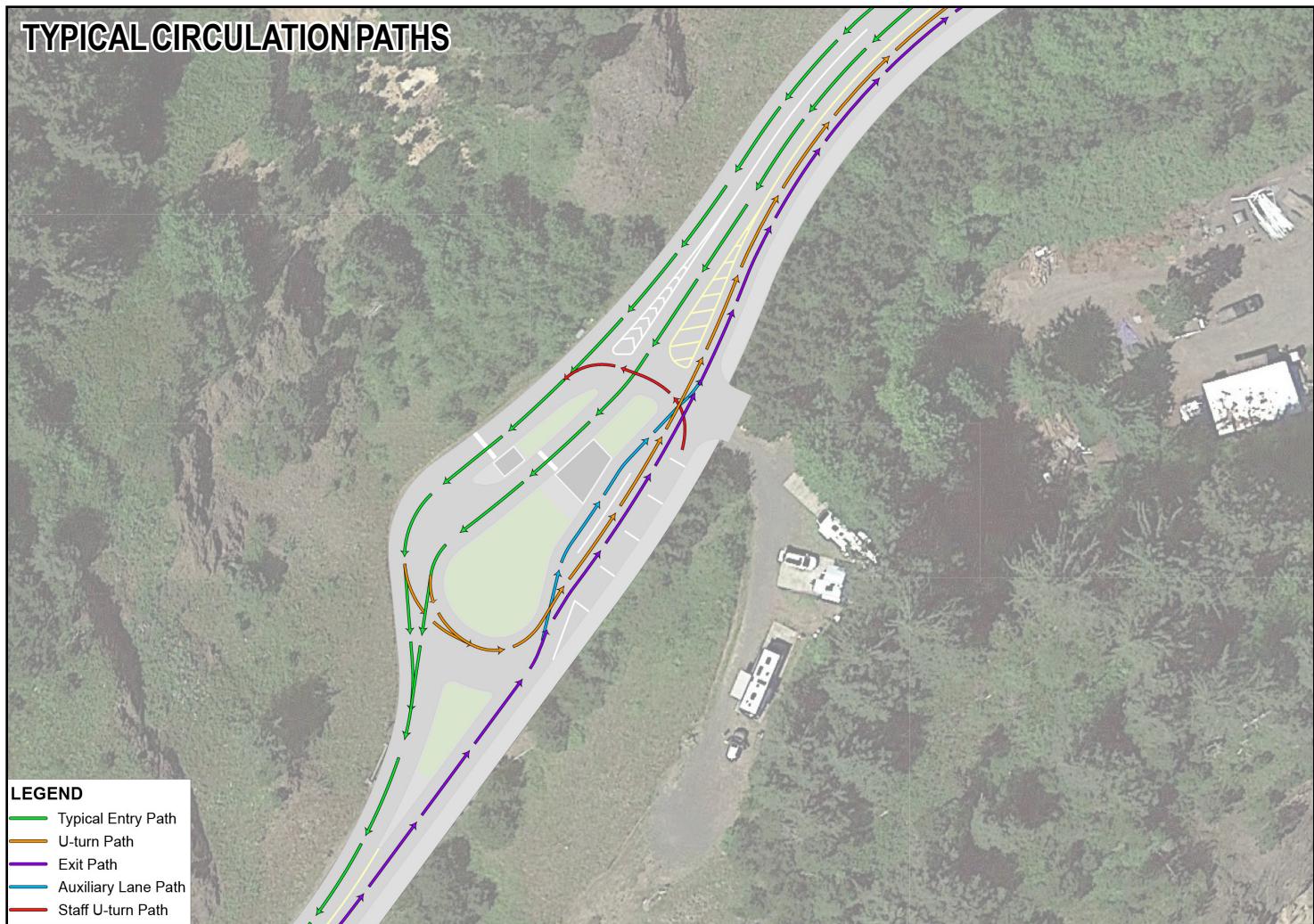


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### ENTRANCE STATION PREFERRED CONFIGURATION

#### TYPICAL CIRCULATION PATHS



#### TRAFFIC PERFORMANCE:

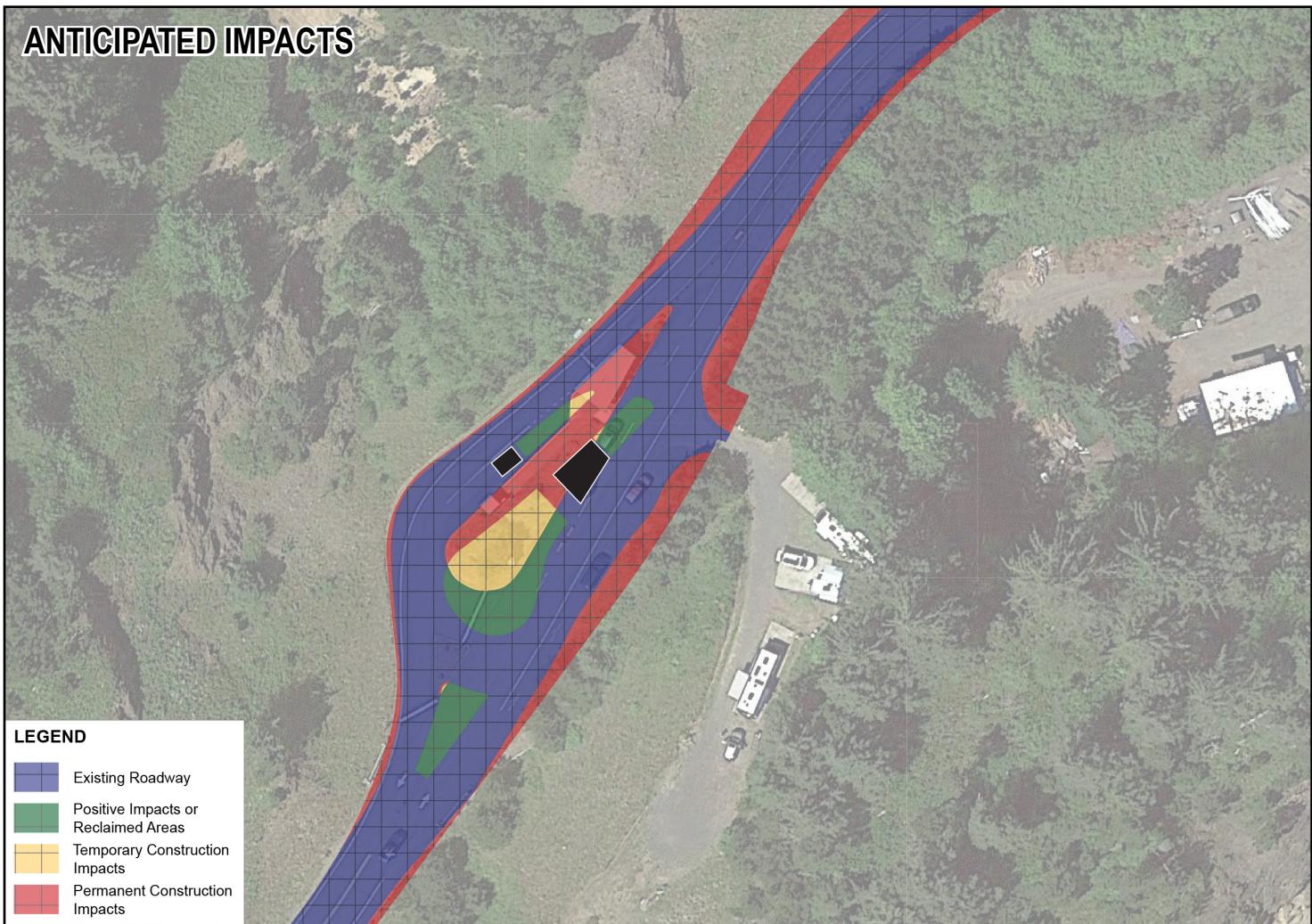
The dual entry lanes with credit card kiosks and barrier gates with automatic arms would help expedite entrance times and reduce queues. Additional informational signage could be incorporated to indicate the fee structure and other common visitor misconceptions to reduce the number of visitor turnarounds. Additional signage would be needed to direct visitors into the appropriate lane based on payment method, pass status, or other variable. More detailed analysis will be required during the design phase to determine the appropriate length of the second entry lane to accommodate visitor demand and reduce queuing effects on Lighthouse Drive outside the ONA boundary.

#### SAFETY PERFORMANCE:

Compared to the existing configuration, this concept has a greater number of merging and diverging conflict points. However, dual entry lanes increase staff safety by removing the need for staff to stand in the roadway to conduct line busting. Incorporating credit card kiosks within or attached to the fee booths would also diminish the need for visitors to park, pay for their pass, and walk to the fee booth to collect their pass from a ranger. Additionally, the proposed SUP would provide protection for non-motorists and physical separation from vehicles, reducing the potential for conflicts. If the SUP is provided on the north side of the entrance station, visitor safety concerns pertaining to landslides and rockfall should be considered and properly mitigated.

## ENTRANCE STATION PREFERRED CONFIGURATION

### ANTICIPATED IMPACTS



### ENVIRONMENTAL IMACTS:

This configuration is designed to fit closely within the existing roadway footprint. Some expansion will be required on the north side of the entrance station to accommodate a second entry lane, and on the south side of the entrance station to accommodate a SUP. If a SUP is installed on the north side, the roadway would have to shift south to avoid potential impacts to the northern hillside that is an active landslide area. Vegetation could be incorporated into the concrete medians where feasible to minimize the additional pavement needed.

### FEASIBILITY/CONSTRUCTIBILITY:

The hillside on the northern edge of the entrance station is an active landslide area, and impacts to this hillside should be avoided as much as possible. Rockfall barriers, retaining structures, or catchments may be needed to stabilize the slope and prevent hazardous landslide events from occurring. The length of the second entry lane should be evaluated in terms of traffic performance but should not extend past the BLM property boundary, which is approximately 500 feet east of the existing fee booth. Potential geotechnical and slope stability constraints should be investigated when determining the feasible length of the second lane. Right-of-way constraints on the south side of the entrance station should also be taken into consideration. A pinch point approximately 175 feet east of the existing fee booth provides approximately 15 feet of space between the edge of the existing pavement and the property boundary. Although no right-of-way acquisition is anticipated, property boundaries would need to be confirmed during design.

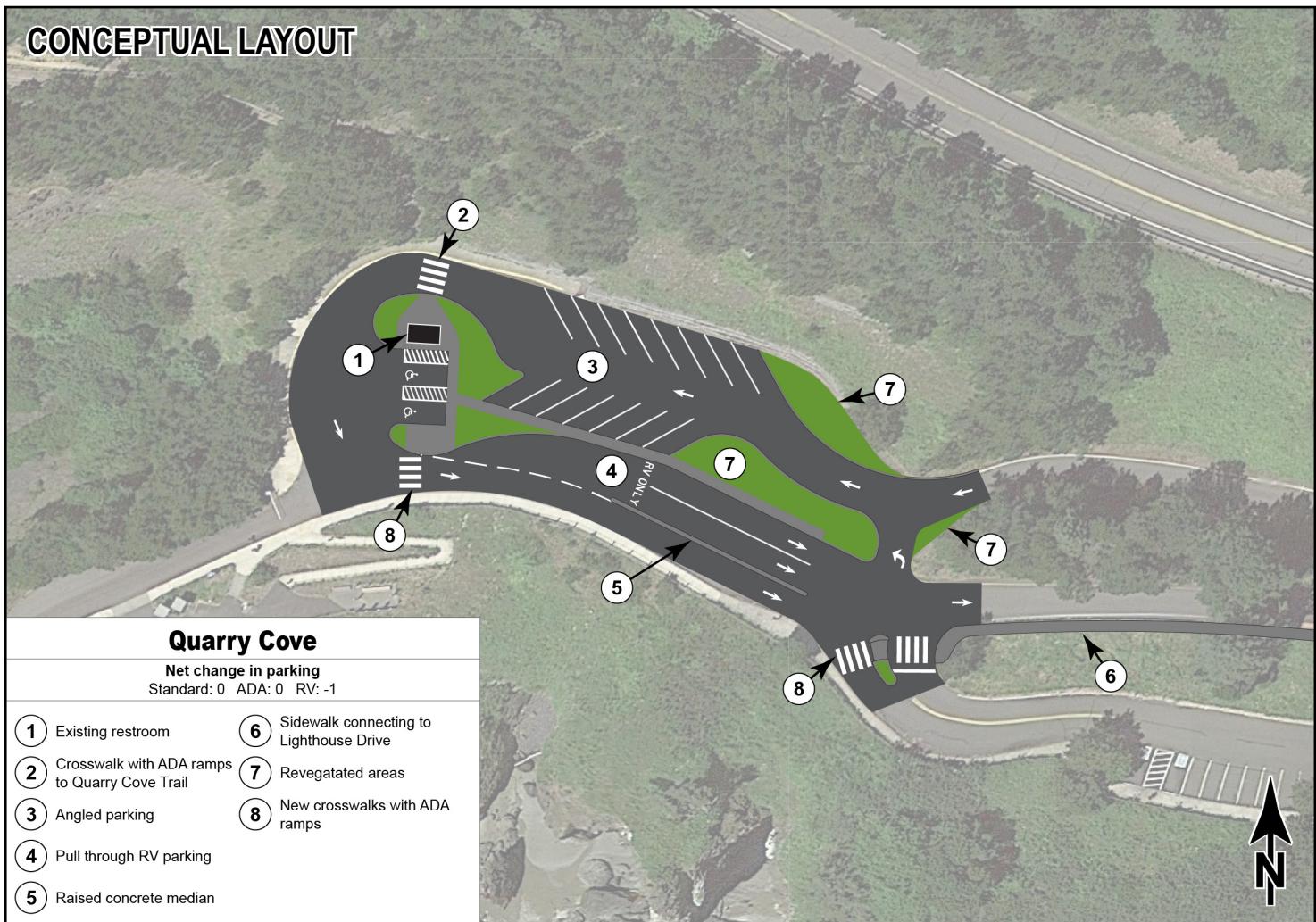


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### QUARRY COVE PARKING LOT PREFERRED CONFIGURATION

#### CONCEPTUAL LAYOUT



#### DESCRIPTION:

This configuration is intended to improve circulation and provide a more logical traffic flow within the existing parking lot footprint. In this configuration, all entering traffic would circulate through a single parking aisle with angled parking stalls on both sides. Two ADA parking stalls would be provided by the restrooms, and two RV/bus parking lanes would be provided on the south side of center island. A sidewalk would also be provided on the exit road between the parking lot and Lighthouse Drive.

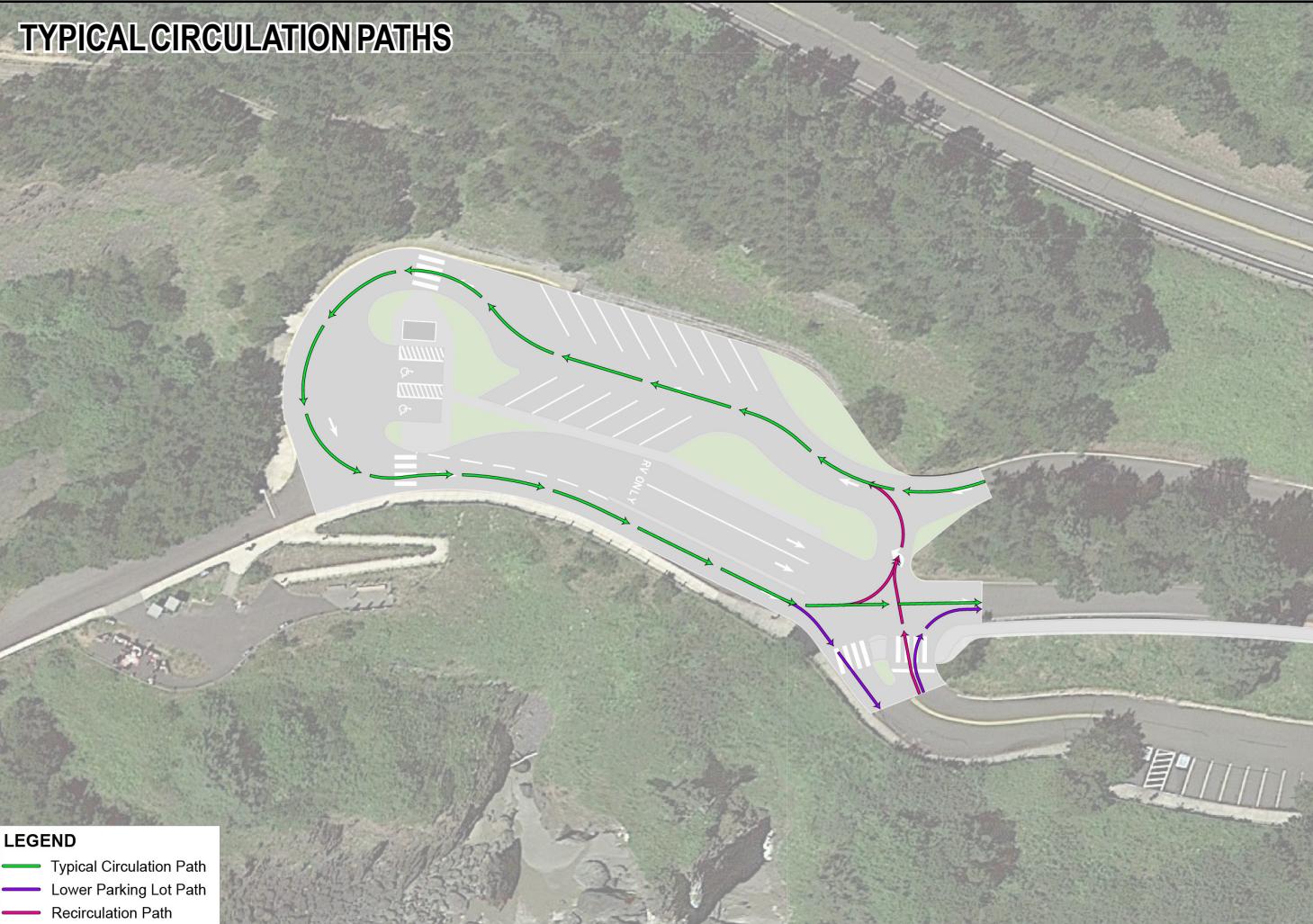
#### MANAGEMENT/MAINTENANCE:

Slightly more maintenance will be required for the sidewalk between the parking lot and Lighthouse Drive. The overall management of this lot is substantially similar to the existing configuration.

#### ESTIMATED COST:

\$600,000 - \$900,000

## QUARRY COVE PARKING LOT PREFERRED CONFIGURATION



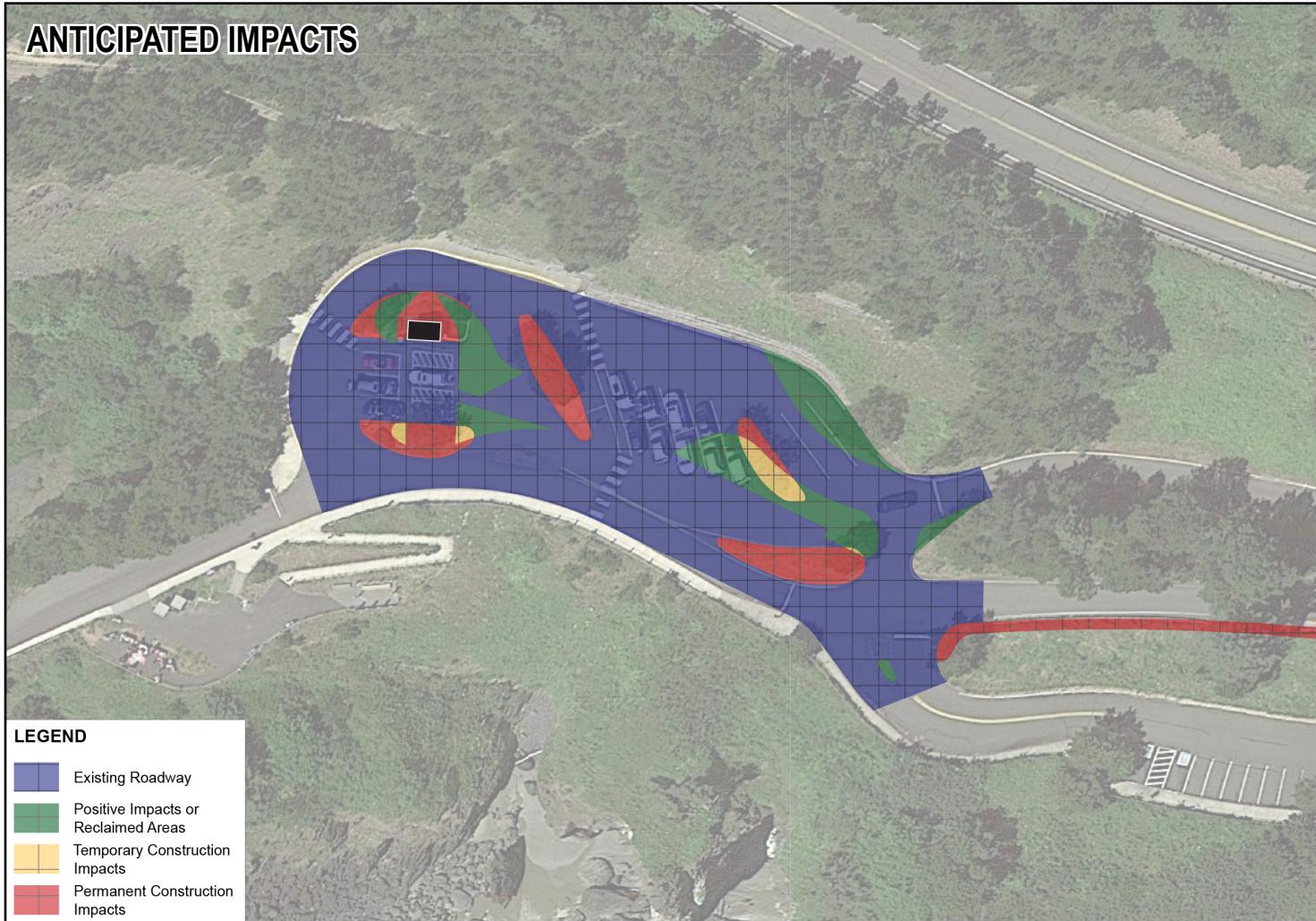
TRAFFIC PERFORMANCE:	SAFETY PERFORMANCE:
<p>This configuration allows more logical and functional circulation through the upper parking lot and provides a more logical flow into the Quarry Cove overflow parking area. To reduce vehicle conflicts, all entering vehicles are directed to circulate through the upper lot before exiting or traveling into the lower lot, which may be frustrating to some visitors. The total number of standard and ADA parking spaces remains the same with this configuration compared to existing. The angled stall closest to the restroom could be converted to an additional ADA stall if desired. There is a loss of one RV/bus parking stall.</p>	<p>The revised circulation pattern is more logical and would likely reduce the potential for conflict due to driver confusion and unintentional wrong-way driving. Construction of the sidewalk on the exit road will help enhance connectivity and provide protection for non-motorists. The crosswalks provide logical connections and help streamline pedestrian movements through the parking lot.</p>



# YAQUINA HEAD Traffic Study

## QUARRY COVE PARKING LOT PREFERRED CONFIGURATION

### ANTICIPATED IMPACTS



### ENVIRONMENTAL IMACTS:

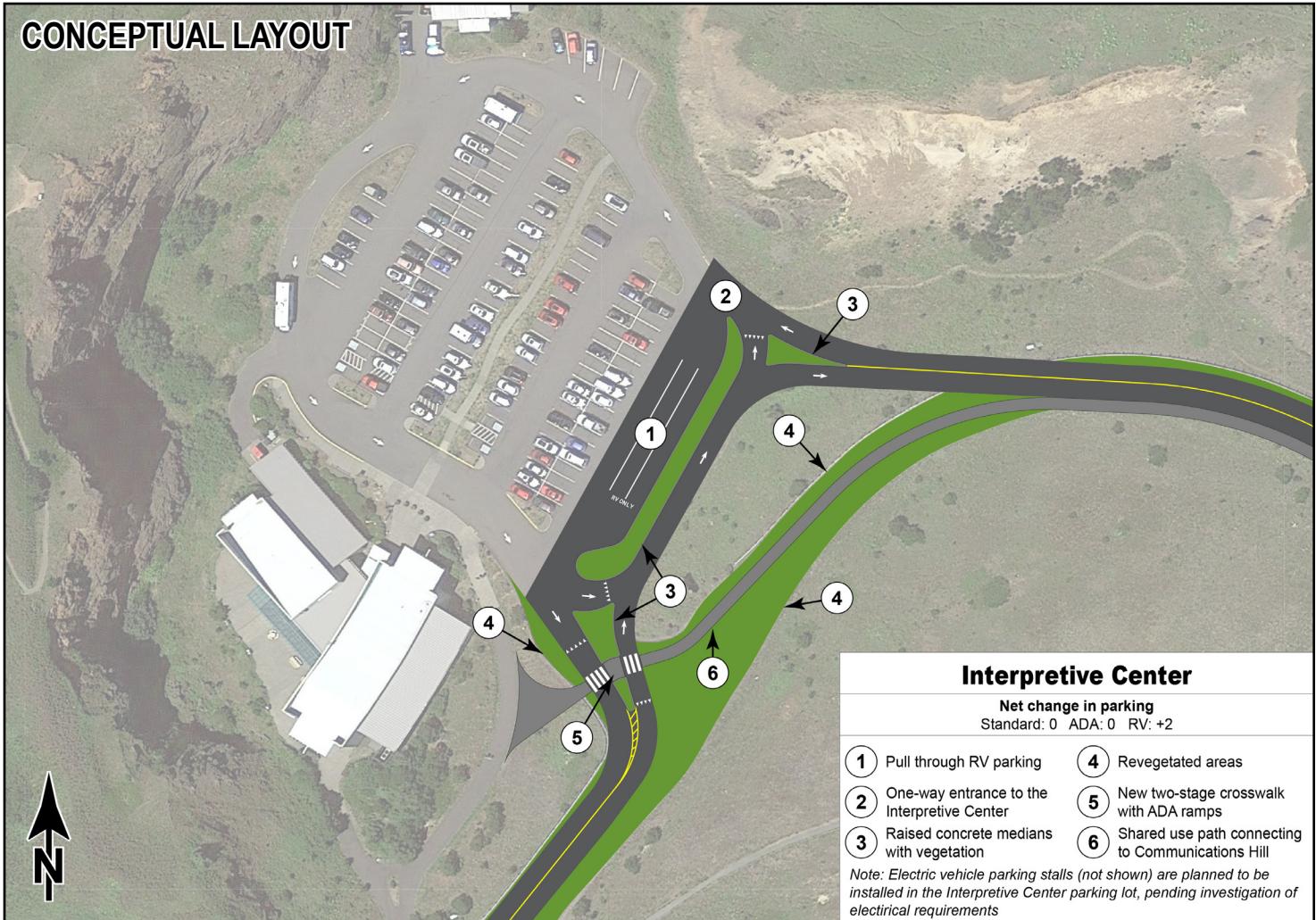
The new configuration is generally designed to fit within the existing paved footprint, with some areas near the entrance allowing for removal of pavement and revegetation. A loss of vegetation would occur where the new sidewalk is installed. Vegetation would be provided within the concrete medians where feasible. The restrooms would remain in their existing location to avoid utility impacts.

### FEASIBILITY/CONSTRUCTIBILITY:

A planning-level feasibility analysis indicates that the parking lot configuration is feasible to construct. However, the overall feasibility of the sidewalk between Lighthouse Drive and the parking lot would have to be determined through further field surveys and geotechnical analyses.

## INTERPRETIVE CENTER PARKING LOT PREFERRED CONFIGURATION

### CONCEPTUAL LAYOUT



### DESCRIPTION:

In this configuration, all traffic would circulate through the Interpretive Center parking lot via a new approach road where the existing dog walk is located. All traffic would be directed to circulate around the outside perimeter of the lot in a counterclockwise motion. A concrete median would help separate eastbound exiting traffic from the remainder of the lot to reduce potential conflicts. A SUP connecting from the Interpretive Center to Communications Hill Trail would be installed in the existing roadbed between the new approach and the existing entrance/exit intersection. Alternatively, a SUP could be installed on the north side of Lighthouse Drive and be routed to connect with the existing path in the center aisle of the parking lot. An additional RV/bus lane would be provided adjacent to the existing lane on the edge of the lot, for a net gain of 2 RV/bus spaces. The configuration and circulation of the internal parking lot would need to be determined in future design phases.

### MANAGEMENT/MAINTENANCE:

This configuration directs all traffic into the Interpretive Center parking lot without requiring staff to move traffic cones each day. By directing all traffic into the parking lot, it is anticipated that more vehicles would park in the Interpretive Center parking lot, potentially reducing the parking demand at the lighthouse. Dynamic signage could be implemented to indicate the number of available parking spaces at the lighthouse to reduce vehicle circulation at the lighthouse. However, regular visitors may be confused or frustrated by the new configuration that eliminates the ability to drive directly to the lighthouse without circling the Interpretive Center parking lot. Increased maintenance would be required for the SUP on Lighthouse Drive. BLM can revisit the configuration and circulation of the internal parking lot during future design phases to best meet user and staff needs.

### ESTIMATED COST:

\$1.1M - \$1.9M

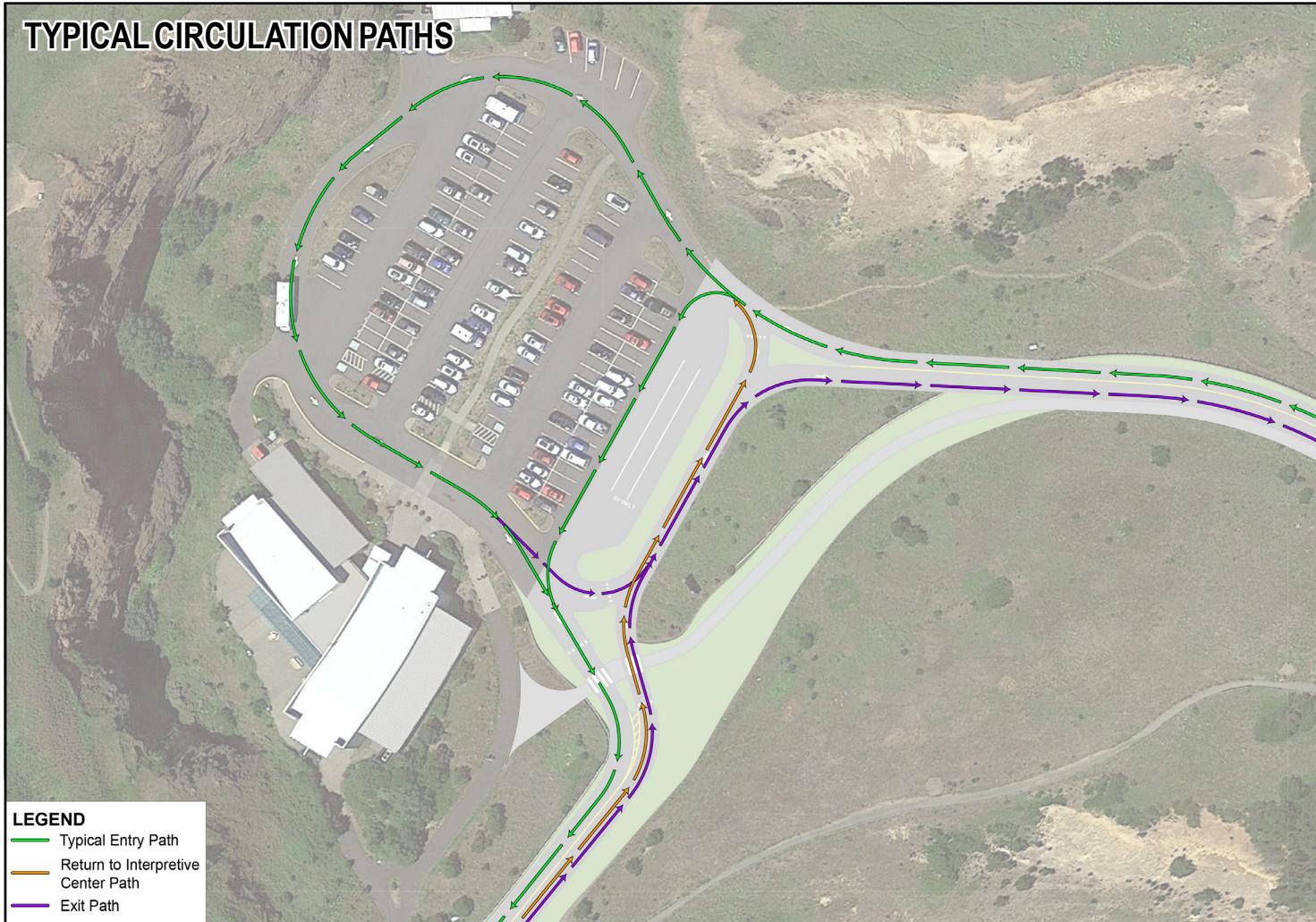


# YAQUINA HEAD

## Traffic Study

### INTERPRETIVE CENTER PARKING LOT PREFERRED CONFIGURATION

#### TYPICAL CIRCULATION PATHS



#### TRAFFIC PERFORMANCE:

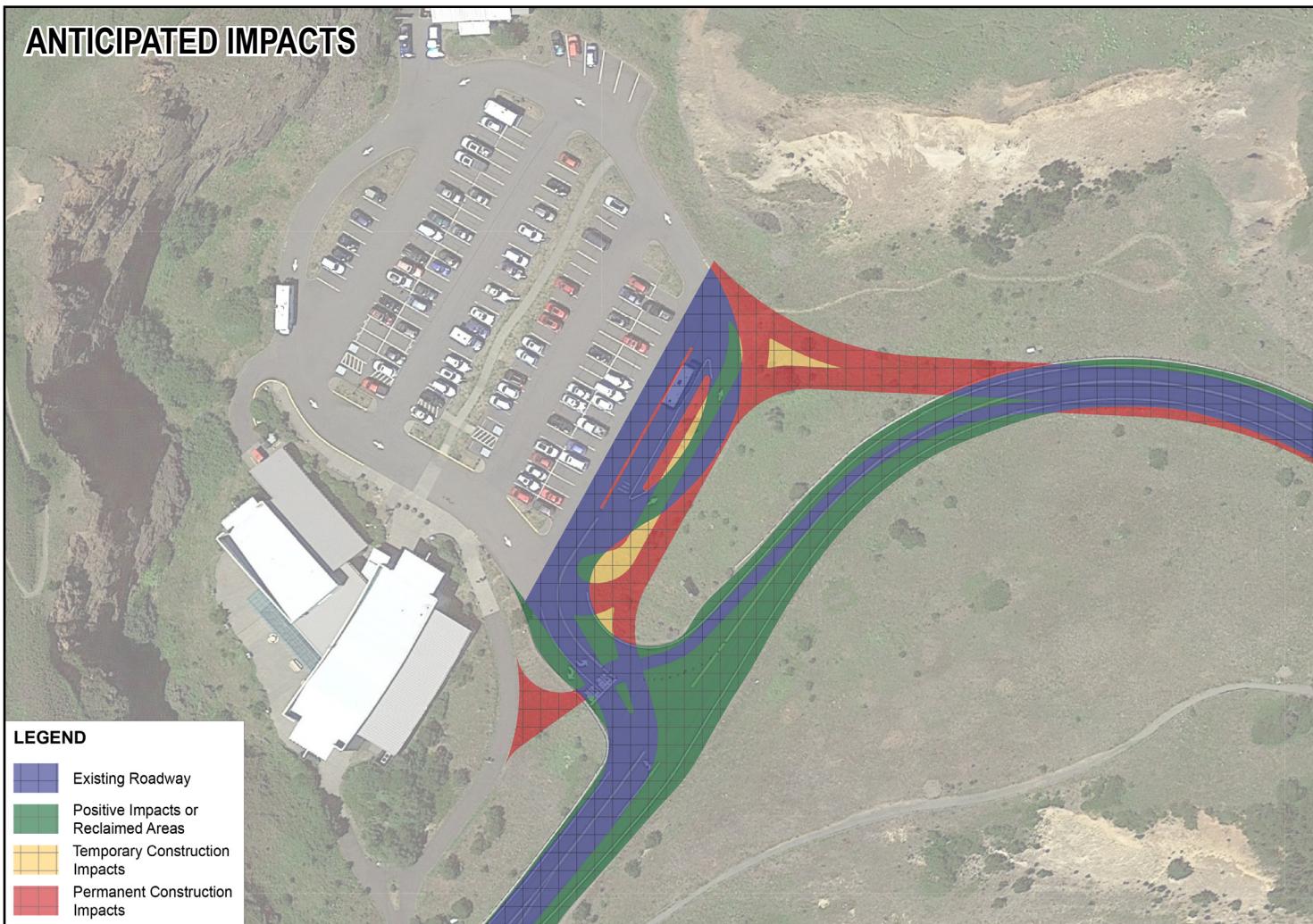
With all traffic routed into the Interpretive Center parking lot, traffic congestion could increase within the lot. However, the separation of eastbound traffic from the remainder of the lot may help alleviate this issue. Due to the potential for increased traffic flow on the northern perimeter of the lot, the parking spaces nearest the maintenance building may be difficult to back out of during peak periods. These spaces may be better suited for staff parking. RVs and buses would have to circle the perimeter of the lot in order to park correctly in the RV/bus lanes on the southeast side of the lot and would also have to circle the lot a second time when leaving. The concrete medians would help direct traffic through the lot and may help make the one-way circulation more logical to visitors, compared to the existing configuration. The new configuration would also eliminate the existing intersection and the need for a stop sign. Although two intersections are provided in the new configuration, only yielding maneuvers are required.

#### SAFETY PERFORMANCE:

A two-stage pedestrian crossing is incorporated where the proposed SUP crosses Lighthouse Drive to meet the existing SUP extending from the Interpretive Center. This type of crossing requires pedestrians to cross only one lane of traffic at a time, allowing refuge in the center island between the entrance and exit lanes. The reconfigured parking lot would remove left-turn movements out of the Interpretive Center and replace that movement with a yield-controlled merging maneuver, which is considered safer due to the lower potential for severe conflicts. Potentially more conflicts are anticipated in the first aisle of the parking lot between the RV parking lanes and the first row of standard parking. It is anticipated that regular visitors may choose to travel down this aisle to more quickly exit and continue to the lighthouse rather than circling the perimeter of the lot.

## INTERPRETIVE CENTER PARKING LOT PREFERRED CONFIGURATION

### ANTICIPATED IMPACTS



### ENVIRONMENTAL IMPACTS:

Considerable impacts would result due to construction of the new entrance road. However, the segment of Lighthouse Drive between the new entrance road and existing intersection would be obliterated and revegetated, except where the new SUP is constructed. Without the need for an eastbound left-turn bay into the Interpretive Center, Lighthouse Drive can be narrowed and revegetated to introduce more positive impacts. Potential temporary impacts may occur during construction on the hillside between Lighthouse Drive and the parking lot and in the dog walk area. Vegetation would be incorporated into concrete medians wherever feasible.

### FEASIBILITY/CONSTRUCTIBILITY:

The slope and alignment of the new entrance road would have to be determined through further field surveys and geotechnical analyses due to steep slopes and potentially constraining rock faces on the northeast side of the parking lot. The SUP could be constructed in the roadbed of the existing portion of Lighthouse Drive that would be removed with this configuration. Constructing the SUP in the roadbed would alleviate feasibility issues that may otherwise exist due to the slope of the new entrance road or the proximity to potentially unstable rockfaces on the northeast side of the parking lot.

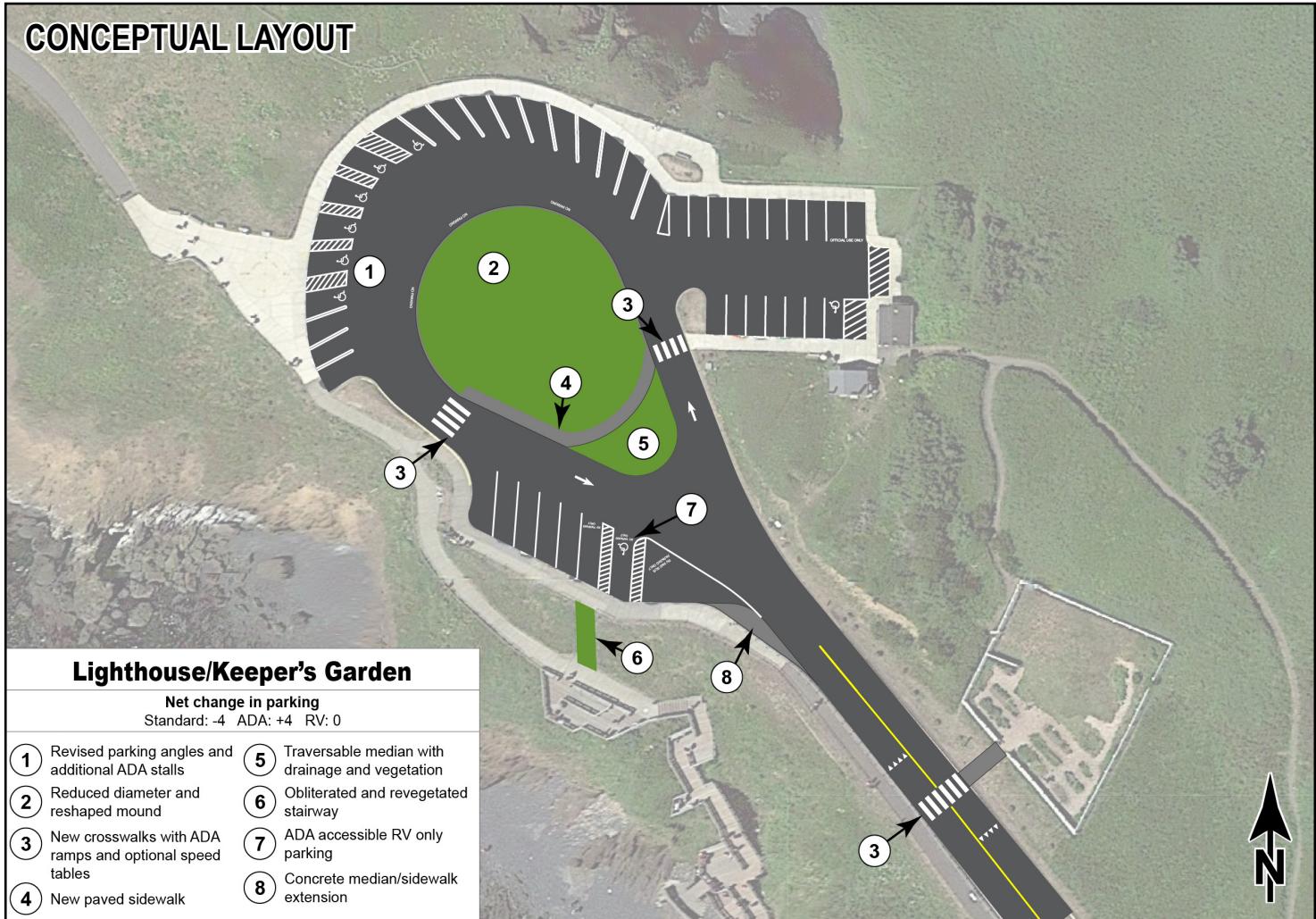


# YAQUINA HEAD

## Traffic Study

### LIGHTHOUSE/KEEPER'S GARDEN PREFERRED CONFIGURATION

#### CONCEPTUAL LAYOUT



#### DESCRIPTION:

The reconfigured lighthouse parking lot would include wider parking stalls with more functional parking angles and more designated ADA-accessible parking. The size of the center island would be reduced to improve vehicular circulation. A sidewalk would be constructed through the center of the parking lot with ADA curb ramps and optional raised crosswalks, or speed tables, to slow traffic and enhance pedestrian visibility. A crosswalk with optional speed table would also be provided from Lighthouse Trail to the Keeper's Garden with a short SUP facilitating easier access to the garden.

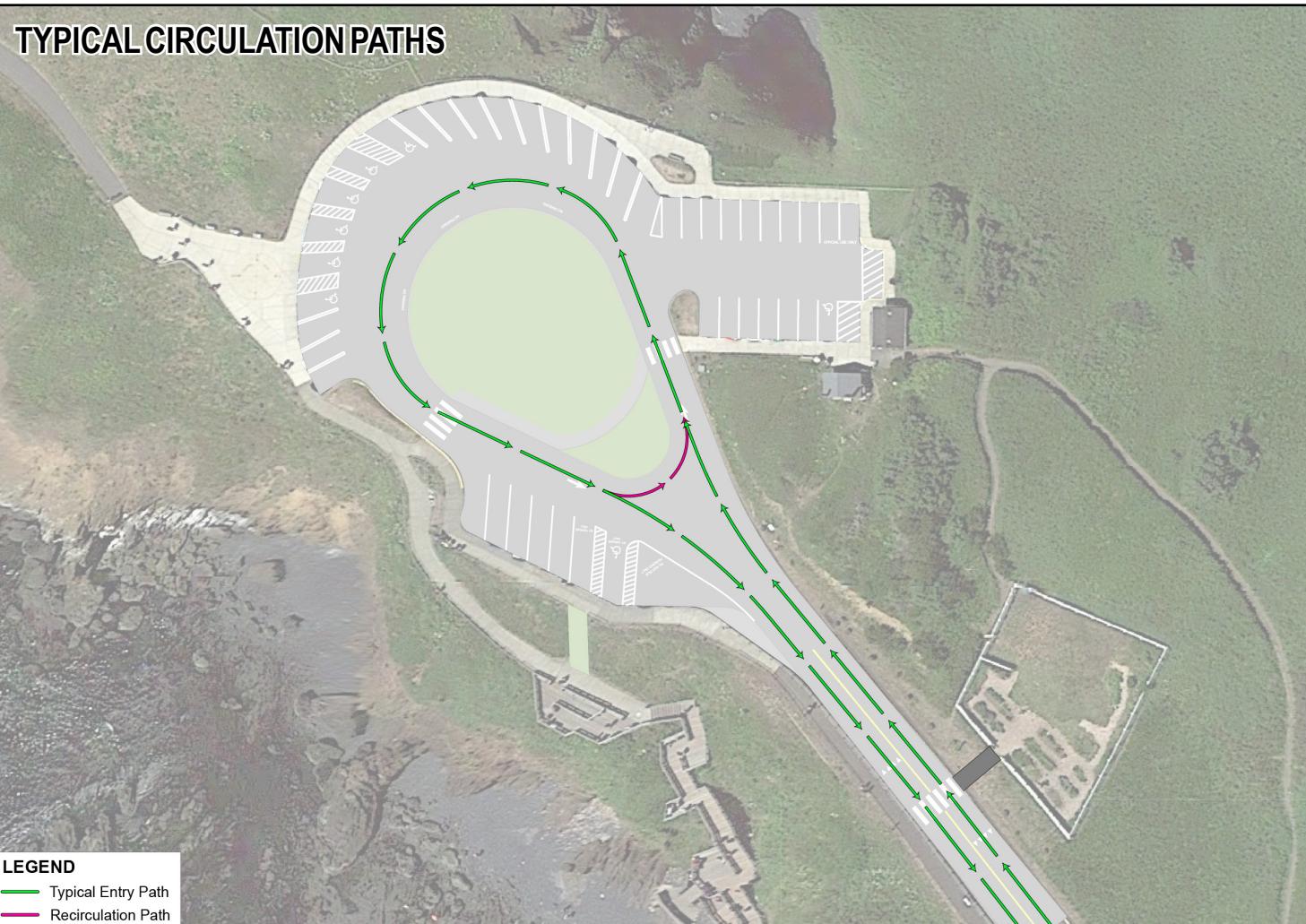
#### MANAGEMENT/MAINTENANCE:

Slightly more maintenance would be required for the SUP leading to the Keeper's Garden and the sidewalk across the center island, however, removal of the stairs to Cobble Beach would decrease required maintenance efforts. The reshaped center island would allow suitable circulation area for large vehicles including BLM maintenance vehicles. If speed tables are pursued, they may impact travel by low-profile vehicles. Although the reconfigured lot would better define parking and circulation, some visitors may become frustrated with the reduction in parking for standard vehicles and the presence of speed tables. During busy periods, enforcement may be needed to ensure ADA and RV/bus stalls are used appropriately.

#### ESTIMATED COST:

\$300,000 - \$700,000

## LIGHTHOUSE/KEEPER'S GARDEN PREFERRED CONFIGURATION



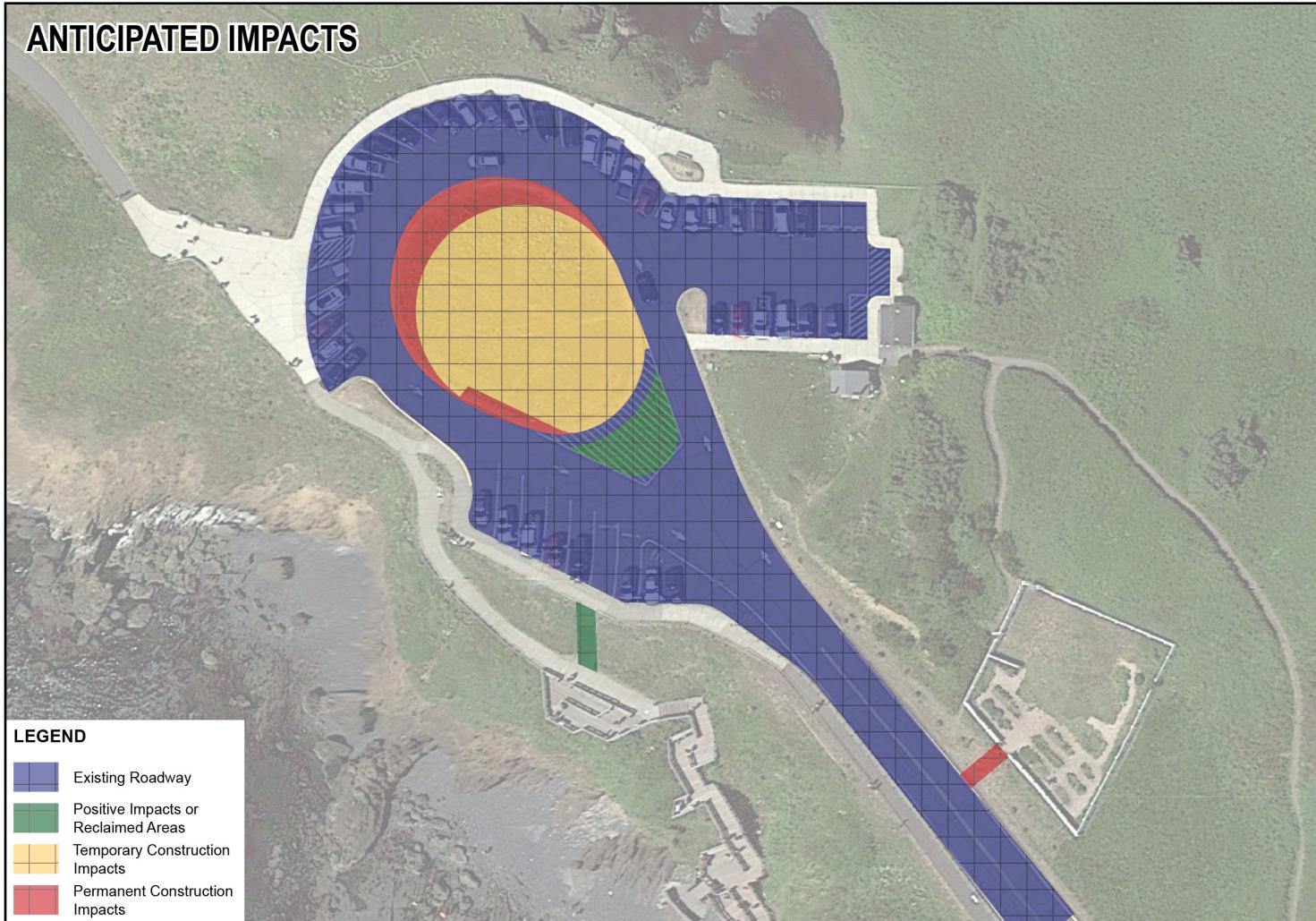
TRAFFIC PERFORMANCE:	SAFETY PERFORMANCE:
<p>This configuration provides revised striping for parking stalls to improve parking angles. The revised striping also converts 4 standard parking stalls to 4 ADA stalls and designates at least one accessible RV/bus stalls. The parking stalls that provide the best views of the lighthouse remain as standard stalls. The center mound would be reduced in size and reshaped to allow for better circulation for large vehicles and allow better views of available parking and pedestrians in the roadway. The pedestrian path through the center mound would help streamline pedestrian movements. Removing the stairway to Cobble Beach would also help promote use of the sidewalk.</p>	<p>The sidewalk through the center island, crosswalks with optional speed tables, and SUP to the Keeper's Garden would help streamline pedestrian movements, enhance visibility of pedestrians, and provide protection for non-motorists through the parking lot. The configuration would also help reduce the potential for inappropriate parking at the eastern nose of the center island and in the irregularly shaped portion of the designated RV/bus parking stall.</p>



# YAQUINA HEAD Traffic Study

## LIGHTHOUSE/KEEPER'S GARDEN PREFERRED CONFIGURATION

### ANTICIPATED IMPACTS



### ENVIRONMENTAL IMACTS:

The new configuration is designed to fit within the existing roadway footprint. A loss of vegetation would occur where the mound is reduced in size and where the SUP to the Keeper's Garden is installed. Additional vegetation would, however, be incorporated where the stairs are removed and in the extension of the center island. Additional impacts would have to be investigated in future environmental analyses, as there is potential that some features could be culturally significant.

### FEASIBILITY/CONSTRUCTIBILITY:

A planning-level feasibility analysis indicates that this configuration is feasible to construct. Some modifications to utilities may be needed in the center island.



# Chapter 7: Implementation

*This study evaluated the existing transportation system at the Yaquina Head ONA to determine areas of concern within the study area and identify improvements to address concerns and enhance the safety and overall experience of all users. A set of sitewide strategies and preferred configurations for four site-specific locations were identified through a comprehensive review of available information on the existing and projected transportation conditions, environmental setting, and other characteristics of the study area, coupled with focused outreach with the public and other stakeholders. Implementation of specific strategies will depend on funding availability, additional environmental analysis, design constraints, and construction considerations determined in coordination with various agencies, stakeholders, and the public.*



# YAQUINA HEAD

## Traffic Study

Improvements can be implemented using federal, state, local and private funding sources. However, federal funding programs will likely be the most appropriate and applicable for improvements within the Yaquina Head ONA. Considering the current funding limits and eligibility requirements of traditional federal programs, the scale of recommended improvements, and possibility of implementing strategies that benefit the regional transportation system, additional funding or support from local and private sources may also be beneficial to accommodate existing and future visitor demands and transportation needs at the ONA. This chapter summarizes potential funding sources and next steps in the project development process once funding is secured.

## 7.1. FUNDING STRATEGIES

On November 15, 2021, the Bipartisan Infrastructure Law, or Infrastructure Investment and Jobs Act (IIJA), was signed into law. The bill reauthorizes several federal-aid surface transportation programs defined by the previous Fixing America's Surface Transportation (FAST) Act through federal fiscal year 2026. The bill also invests approximately \$400 billion over that period to repair the nation's roads and bridges and support projects that will create jobs, boost the economy, make the transportation system safer and more resilient. In addition to reauthorizing surface transportation funding programs, the IIJA also contains significant new funding for roadways, bridges, and other major projects funded by FHWA and the US Department of Transportation.

The following sections provided an overview of federal funding sources authorized under IIJA that may be applicable for transportation projects and programs in the Yaquina Head ONA. A narrative description of each potential funding source is provided including the source of revenue, required match, purpose for which funds are intended, means by which the funds are distributed, and the agency or jurisdiction responsible for establishing priorities for use of the funds.

### 7.1.1. Federal Lands Access Program (FLAP)

The Federal Lands Access Program (FLAP) was created to provide safe and adequate transportation access to and through federal lands for visitors, recreationists, and resource users. The program is directed towards public

highways, roads, bridges, trails, and transit systems that are located on, adjacent to, or provide access to federal lands and for which title or maintenance responsibility is vested in a state, county, town, township, tribal, municipal, or local government. In this case, improvements to US 101, Lighthouse Drive, NW Rocky Way, NW Gilbert Way and trails connecting to Yaquina Head ONA (federal land owned and operated by BLM) would be eligible for FLAP funding.

The FHWA Western Federal Lands Highway Division administers the program, and local governments are eligible applicants for the funds. All proposals must be submitted jointly by the Federal Land Management Agency(ies) (FLMA) whose lands are accessed and the entity with title or vested maintenance responsibility (state, county, town, township, tribal, municipal or local government). Projects eligible for funding include capital improvements, site enhancements, surface preservation, safety improvements, transit services/facilities, planning studies, and research projects. Competitive projects are those that improve multimodal transportation on roads, bridges, trails, transit systems, and other transportation facilities, with an emphasis on high-use federal recreation sites and federal economic generators.

Funds are allocated among the states using a statutory formula based on road mileage, number of bridges, land area, and visitation. Oregon is currently estimated to receive approximately \$39 million in FLAP funds annually. Proposals requesting at least \$100,000 or more will be considered. Under IIJA, a local match is no longer required.

### 2021 FLAP PROPOSAL

The Western Federal Lands Highway Division of FHWA solicited for proposals to receive funds through Oregon FLAP in fiscal years 2024 and 2025. ODOT, City of Newport, and BLM submitted a joint proposal for access improvements to Yaquina Head ONA. The proposed improvements included the addition of designated pedestrian/bicycle facilities on Lighthouse Drive, NW Rocky Way, and US 101; pedestrian crossing improvements at the US 101/Lighthouse Drive intersection and Lighthouse Drive approaches; ADA-accessible sidewalk to fill gaps adjacent to US 101; provision of a shuttle bus and ADA-accessible transit stop within adjacent city right-of-way; and pavement preservation on Lighthouse Drive.

## 7.1.2. Federal Lands Transportation Program (FLTP)

The Federal Lands Transportation Program (FLTP) was established to improve the transportation infrastructure owned and maintained by FMLAs including BLM, USFWS, National Park Service (NPS), US Forest Service (USFS), US Army Corps of Engineers, Bureau of Reclamation, and independent federal agencies with land and natural resource management responsibilities. By statute the NPS, USFWS, and USFS receive annual sums. Other FMLAs receive funding based on application submissions and determinations by the Office of the Secretary of Transportation by use of a performance management model. The federal share for FLTP projects is 100 percent. In addition, FLTP funds may be used to pay the non-federal share or match of the cost of any project that is funded under title 23 of United States Code (USC) [FLAP] or chapter 53 of title 49 USC [Public Transportation], and that provides access to or within federal or tribal land.

FLTP invests in the nation's infrastructure and supports critical transportation needs within the country's transportation network by providing access within national parks, forests, wildlife refuges, recreation areas, and other federal public lands. FLTP funding is available for program administration, transportation planning, research, preventive maintenance, engineering, rehabilitation, restoration, construction, and reconstruction of federal lands transportation facilities as well as capital, operations, and maintenance of transit facilities. The program focuses on improving transportation facilities that are located on, adjacent to, or provide access to federal lands. The facilities must be owned and maintained by the federal government.

In this case, BLM would be eligible to receive FLTP funds for improvements within the ONA. FLTP funds could also be used as a match for FLAP funds received by ODOT or City of Newport if needed. BLM generally uses FLTP for improvement projects within the ONA. FLTP funds would likely be the largest potential funding source for the proposed improvements at the site.

## 7.1.3. Direct Federal Spending for Resilient Recreation Sites

The DOI Office of the Secretary will implement a new funding program under IIJA to improve resilience of recreation sites on federal lands, including Indian forest

or range lands. The Office of the Secretary is authorized to spend allocated funds on projects to restore, prepare, or adapt recreation sites on federal land that have experienced or may likely experience visitation and use beyond the carrying capacity of the sites. Funding is available until expended for total amount of \$905 million across the entire program. However, portions of the total program amount are allocated to specific fiscal years, each with a different period of availability. The 2022 funding amount is \$45 million.

If visitation at Yaquina Head ONA continues to increase beyond the carrying capacity of the site, it is possible the ONA may be eligible for funding under this program.

## 7.2. NEXT STEPS

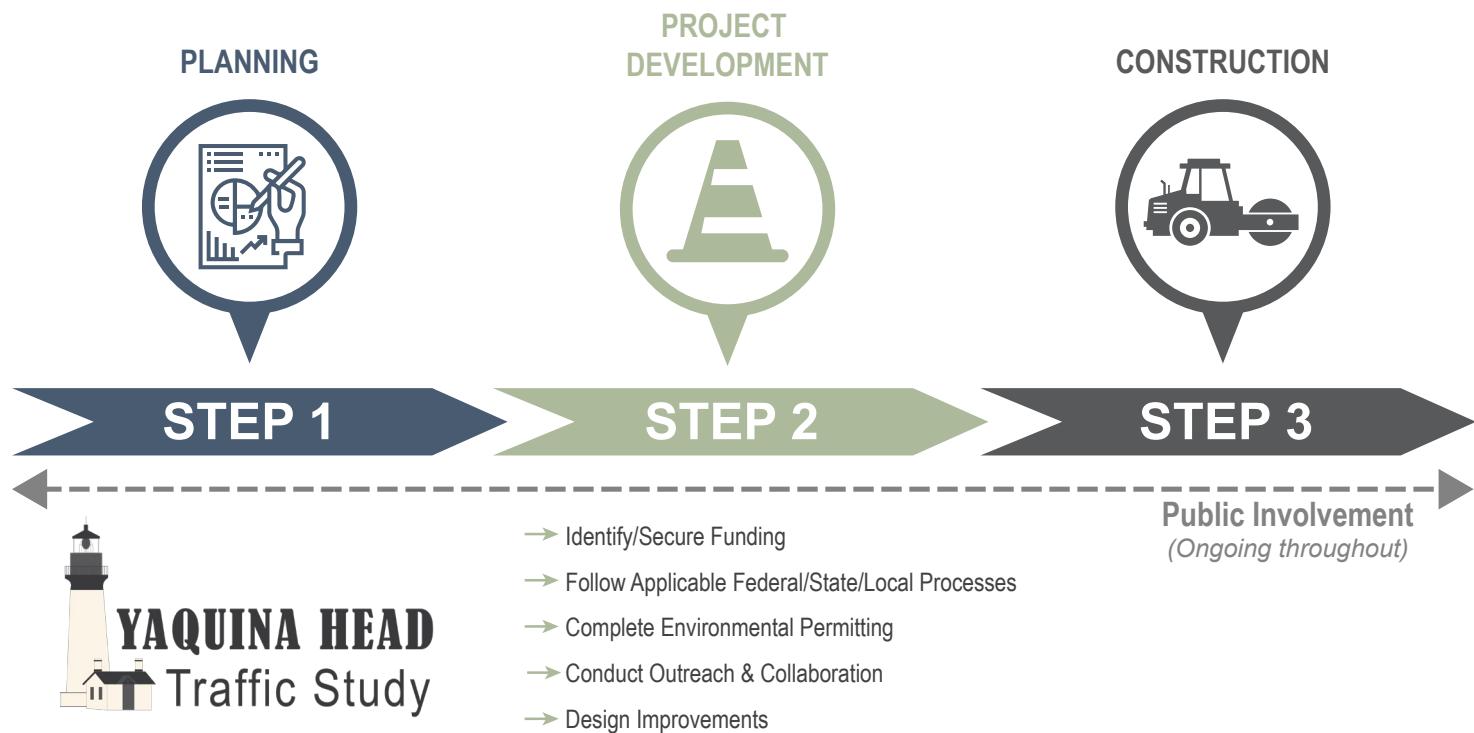
The *Yaquina Head Traffic Study* is a planning document that helps identify potential improvements to be completed as funding becomes available. At this time, no funding or timeframe for construction of the recommended projects has been identified. **Figure 10** illustrates the project implementation process. After the traffic study is complete, a project would advance from the planning stage into the project development and eventual construction phases. Public involvement would occur throughout all phases. The general next steps for implementation are listed below.

1. A funding source(s) is identified and secured.
2. The project is nominated for execution by the implementing agency.
3. Feasibility studies, environmental investigations, and other development processes are completed as applicable.
4. A design is completed for the project and approved by responsible agency(ies) as needed.
5. Right-of-way is acquired for the project if necessary.
6. The project is constructed.

Although improvements initiated onsite at Yaquina ONA would fall under BLM jurisdiction, it will be important to coordinate with ODOT and the City of Newport to ensure that connecting facilities are consistent with the transportation needs of all agencies involved.



# YAQUINA HEAD Traffic Study



**FIGURE 10: PROJECT IMPLEMENTATION PROCESS**

### 7.2.1. Environmental Review Process

The National Environmental Policy Act (NEPA) process begins when a federal agency develops a proposal to take a major federal action as defined in 40 Code of Federal Regulations 1508.1. Federal actions include adoption of official policy, formal plans, or program, as well as approval of specific projects, such as construction or management activities. Each federal agency is required to develop NEPA procedures that supplement the general regulations. BLM's *NEPA Handbook (H-1790-1)*<sup>18</sup> provides additional guidance on BLM-specific NEPA compliance activities. Several jurisdictions have also established state or local environmental review requirements, however, Oregon relies on the federal NEPA regulations.

The environmental review under NEPA can involve three different levels of analysis—Categorical Exclusion Determination (CATEX), Environmental Assessment (EA), and Environmental Impact Statement (EIS)—as discussed in the following sections. Based on the scope and scale of the proposed improvements, an EA may be required for site-specific improvements and some sitewide strategies. In most cases, a CATEX will be sufficient to implement other sitewide strategies such as wayfinding or installing bike racks.

#### CATEGORICAL EXCLUSION DETERMINATION (CATEX)

A federal action may be categorically excluded from a detailed environmental analysis when the federal action normally does not have a significant effect on the human environment. BLM provides a list of categorical exclusions with extraordinary circumstances which must be reviewed for applicability. If an extraordinary circumstance applies, the proposed action defaults to the next level of environmental review. When no extraordinary circumstances apply, a CATEX is prepared. The list is included in the DOI *Department Manual Part 516 Chapter 11*.<sup>19</sup>

#### ENVIRONMENTAL ASSESSMENT/FINDING OF NO SIGNIFICANT IMPACT (EA/FONSI)

If the federal agency determines that a CATEX does not apply to a proposed action, the agency may then prepare an EA. The EA determines whether or not a federal action has the potential to cause significant environmental effects. BLM provides specific guidance for preparing an EA in Department Manual 516. The manual states that an EA is usually appropriate for land use plan amendments and land use plan implementation decisions including site-specific project plans, such as construction of a trail.

If the responsible official is uncertain of the potential for significant impacts and needs further analysis to make a determination, an EA should be completed.

Generally, the EA includes a brief discussion of:

- The purpose and need for the proposed action
- Alternatives as described in section 102(2)(E) of NEPA
- The environmental impacts of the proposed action and alternatives
- A listing of agencies and persons consulted

If the agency determines that the action will not have significant environmental impacts, the agency will issue a Finding of No Significant Impact (FONSI). A FONSI is a document that presents the reasons why the agency has concluded that there are no significant environmental impacts projected to occur upon implementation of the action. If it is anticipated or determined that the action would result in significant environmental impacts, an EIS is prepared.



*It is anticipated that an EA would be required to assess the environmental impacts of each of the site-specific improvements.*

## **ENVIRONMENTAL IMPACT STATEMENT (EIS)**

Federal agencies prepare an EIS if a proposed major federal action is determined to significantly affect the quality of the human environment. An EIS should also be completed in circumstances where a proposed action is directly related to another action(s), and cumulatively the effects of the actions taken together would be significant, even if the effects of the actions taken separately would not be significant. The regulatory requirements for an EIS are more detailed and rigorous than the requirements for an EA. The EIS process ends with the issuance of the Record of Decision which explains the agency's decision, describes the alternatives the agency considered, and discusses the agency's plans for mitigation and monitoring, if necessary.

### ***7.2.2. Cultural and Historic Review Process***

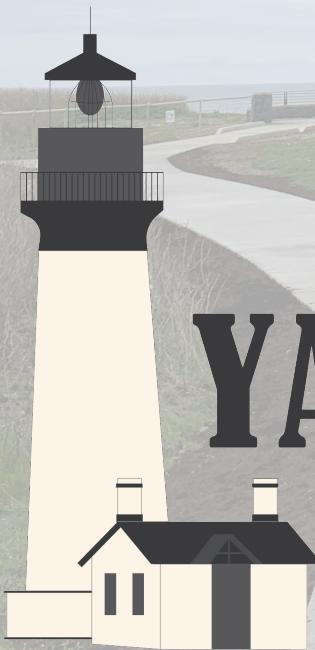
Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of their undertakings on historic properties and sites. Additionally, NEPA requires an analysis of potential impacts to cultural, historic, and tribal resources and possible mitigation measures. It is BLM policy to coordinate NEPA and NHPA responsibilities, including consulting with appropriate entities such as State and Tribal Historic Preservation Officers (SHPO/THPO), identifying protected properties and sites, evaluating project alternatives and assessing project effects on protected resources, and resolving any adverse effects.<sup>20</sup> BLM would conduct NHPA and NEPA reviews concurrently for future improvement projects at the Yaquina Head site.



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# YAQUINA HEAD

## Traffic Study

*The Yaquina Head Outstanding Natural Area was established by Congress to provide for the conservation and development of the scenic, natural, and historic values of the area; the continued use of the area for education, scientific study, and public recreation; and protection of the wildlife habitat of the area.*