ESTACADA
ACTIVE
TRANSPORTATION PLAN

Estacada, Oregon
Adopted September 24th, 2018
Acknowledgments

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This chapter includes typical designs for unique facilities and provides guidance for bike parking, bench placement, and lighting.
INTRODUCTION
INTRODUCTION

The City of Estacada developed an Active Transportation Plan to supplement the City’s overall Transportation System Plan. This includes the identification of key walking and biking routes that support safe routes to schools, routes to the downtown and riverside area, connections to public transit, and integration with regional recreational opportunities. The Plan emphasizes the design of walking and biking facilities that are comfortable for people of all ages and abilities. The adoption of the Active Transportation Plan sets the stage for the City to secure federal and state funding to turn the plan into reality.

WHAT IS ACTIVE TRANSPORTATION?

Active Transportation (AT), often called “non-motorized transportation,” is when people transport themselves under their own power, such as walking or biking (Figure 1). Supporting these modes of travel as key elements of the transportation network encourages active, healthy lifestyles and provides options for those who cannot or choose not to drive.

Figure 1. Examples of Active Transportation

Citation: Wyoming Pathways; Caltrans District 2

Active transportation provides several benefits including:

- **Social**: active transportation increases social interactions within the community.
- **Economic**: active transportation reduces travel costs (such as fuel and vehicle maintenance costs), encourages bicycle tourism, and is a key element in vibrant downtown shopping districts.
- **Health**: active transportation provides opportunities to be physically active on a regular basis.
- **Environmental**: active transportation can contribute to reductions in greenhouse gas emissions and noise pollution.
PROJECT AREA

The City of Estacada is located in Clackamas County along Clackamas Highway (Highway 211-224) and the Clackamas River and near Milo McIver State Park. Estacada is a place to reconnect with nature and escape the roar of traffic. With its acres of forest and miles of river, Estacada is a well-known destination for great active transportation and other outdoor recreation opportunities. Hiking, cycling, and rafting are just a few examples of the activities available nearby. The Estacada Active Transportation Plan has recommendations for walking and biking facilities within the Estacada Urban Growth Boundary (Figure 2) as well as key connections to regional destinations.

Major Destinations
Creating a safe and comfortable network of walking and cycling routes for people of a wide range of ages and abilities is essential for encouraging people to choose active transportation. For Estacada, this means creating safe routes to schools, routes to the downtown and riverside area, connections to public transit, and integration with regional recreational opportunities.

The major destinations within Estacada are shown on Figure 2. The majority of the destinations are centered around the downtown area and bordered by the residential areas. Parks and recreational areas located in and around the town include Milo McIver State Park, Timber Park, and Lakeshore Trail. Other key destinations include the Estacada Public Library and Wade Creek Park located in the northwest area of the city. The schools are clustered together north of the downtown commercial district, and create a hub of activity where children of a variety of ages may use the same or similar routes to school.

1 www.estacadalibrary.org
Figure 2. Major Destinations

- Employment Center
- Campanella City Park
- Future Cascadia Ridge Park
- Farmers Market
- River Mill Elementary
- Foothills Greenway
- Estacada High
- Estacada Middle School
- Clackamas River Elementary
- Post Office
- Grocery
- City Hall
- Fire Station
- Cazadero Heights Park
- Estacada Community Center
- Milo McIver State Park
- Lakeshore Trail
- Wade Creek City Park
- Estacada Portal
- Timber Park
- Downtown

Legend:
- Park
- School
- Downtown
- SAM Stop
- Tri-Met Bus Stops
- Existing Shared Use Path
- City Limit
- Outside Urban Growth Boundary
EXISTING TRANSPORTATION NETWORK CONDITIONS AND DEFICIENCIES

This section provides information about the condition of the existing transportation network throughout Estacada, including evaluations of:

- Street Functional Classifications
- Average Daily Traffic Volumes and Posted Speeds
- Crash History
- Pedestrian Facilities
- Bicycle Facilities
- Shared-use Paths and Trails

Street Functional Classifications

Functional classification is the characterization of roadways based on the service they provide. Street functional classification is an important tool for managing the roadway network. By designating the management and design requirements for each roadway classification, this hierarchical system supports a network of streets that perform as desired and help to determine which types of walking and biking accommodations are needed. The existing functional classification designations for streets in the City of Estacada can be seen in Figure 3, with descriptions of the intended function for each classification provided below. It should be noted that Major Collectors, Minor Collectors, and Local Streets occasionally end up serving longer, regional trips, and often provide a more comfortable alternative to Arterial routes for people biking.

- **Arterials:** Primary purpose is to serve through traffic over longer distances, such as connecting city centers to rural areas. They are generally high-volume and high-speed roadways. They generally require more separation from adjacent traffic to improve safety and comfort for people walking and biking.

- **Major Collectors:** Primary purpose is to facilitate the movement of city traffic within the Urban Growth Boundary (UGB). They typically carry lower traffic volumes at lower speeds compared to arterials. On-street parking may be present in some areas. Appropriate treatments for people walking and biking will vary depending on speed and volume of adjacent traffic.

- **Minor Collectors:** Primary purpose is to provide connections from neighborhoods to major collectors, and sometimes arterials. They frequently carry lower traffic volumes at lower speeds than major collectors. On-street parking may be present in some areas. Appropriate treatments for people walking and biking will vary depending on speed and volume of adjacent traffic.

- **Local Streets:** Primary purpose is to provide direct access to private dwellings and businesses. Parking is typically provided on one or both sides of the street. Local streets are intended to carry low traffic volumes at low speeds. Local streets generally require the least separation for people walking and biking.

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2 Estacada Transportation System Plan, 2007
**Posted Speeds**

Speed plays a critical role in the cause and severity of collisions involving people walking and biking. This includes the driver’s visual perception of other roadway users, their ability to stop safely, and the speed of the collision. Higher speeds dramatically increase the chance a person walking will not survive a collision with a car (Figure 4).

![Figure 4. Influence of Driving Speed on Pedestrian Survival after a Crash](image)

A shared roadway treatment for bicycles is considered inappropriate on higher speed roadways due to conflicts created by speed differentials. Best practices, according to the National Association of City Transportation Officials (NACTO), specify that shared lane markings should be limited to situations where the speed differential between a person driving and a person bicycling is very low, such as low volume streets with a design speed of less than 25 mph or downhill segments where people bicycling may travel faster.

Speed limits within Estacada range between 20 and 55 mph with slower speeds throughout the downtown and residential areas (Figure 5). Where speeds are not posted, or not shown in Figure 5, drivers are expected to follow Oregon Statutory Speeds of 20 mph in business districts and school zones and 25 mph in residential districts and near public parks.

Lower speeds (25 mph or less) are more conducive to safe and comfortable walking and cycling facilities. The higher speed streets (30 mph or greater) include Highway 211-224, Coupland Road, and Eagle Creek Road north of the city limits. The higher speed segments of Coupland Road and Eagle Creek Road are largely outside of the urbanized area, but Highway 211-224 passes adjacent to the downtown and separates much of the community from the riverside area.

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Figure 5. Posted Speed Inventory

- **Posted Speed Limit**
  - 20 mph
  - 25 mph
  - 35 mph
  - 40 mph
  - 45 mph
  - 50 mph
  - 55 mph

- **SAM Stop**
- **Tri-Met Bus Stops**
- **Existing Shared Use Path**
- **East Urban Growth Boundary**
- **City Limit**
- **Park**
- **Downtown**
- **School**

Locations mentioned in the map include:
- Miha McIver State Park
- Timber Park
- Waco Creek City Park
- River Mill Elementary
- Estacada High
- Estacada Middle School
- City Hall
- Lakeshore Trail
- Cazadero Heights Park
- Clackamas River
- Downtown

The map shows the posted speed limits and other transportation-related features within the Estacada area.
Average Daily Traffic Volumes

The amount of vehicular traffic using a street provides an indication of the level of exposure experienced by people walking and biking to motor vehicles. The volume of Average Daily Traffic (ADT) is commonly used as a guide for the selection of desirable active transportation facilities. In general, as ADTs increase, the degree of separation from motor vehicles also increases. As an example, when traffic volumes reach 3,000 vehicles per day, it becomes less desirable to have people biking share travel lanes with motor vehicles and separate facilities such as bike lanes become necessary.

Weekday traffic volumes were collected on several streets within Estacada to better inform decisions about active transportation facility needs. A few routes such as Highway 211-224, parts of N Broadway and NE/SE Main Street, and NE/NW 6th Avenue have volumes surpassing the 3,000 vehicles per day threshold. The traffic volumes are illustrated in Figure 6.
Figure 6. Average Daily Traffic Volumes

[Map showing various locations with traffic volume data]

- Average Daily Traffic Volume 2017
- SAM Stop
- Tri-Met Bus Stops
- Existing Shared Use Path
- Outside Urban Growth Boundary
- City Limits
- Downtown
- Park
- School
Crash History

Crash data from 2011 through 2015 (the most recent five years available) was obtained from the Oregon Department of Transportation and reviewed to identify any high-crash locations and trends involving people walking or biking. These crashes are mapped in Figure 7. During this five-year period, there was a total of 128 crashes, 11 of which involved a person walking and one involved a person biking.

Two pedestrian crashes resulted in serious injuries, with both occurring on higher speed roads (35 mph or greater). One occurred on Highway 211 where there are only narrow shoulders for people walking and the other occurred in the intersection on Highway 211-224 with Main Street.

All other pedestrian crashes occurred in either the downtown or near schools and resulted in minor to moderate injuries. This included two crashes at the intersection on NW 6th Avenue at Broadway Street and two more at the intersection on NW 6th Avenue at Pierce Street.

The single crash involving a driver and a person on a bike occurred on Eagle Creek Road just north of River Mill Road. The crash resulted in a moderate severity injury and occurred in the late afternoon. In this area, the posted speed on Eagle Creek Road is 45 mph and the shoulders are narrow. The poorly defined access to adjacent businesses may have been a factor in this crash.

The crash analysis was supplemented by a review of ODOT’s Safety Priority Index System listings for locations in the city that ranked among the state’s top ten percent of hazardous locations. The Safety Priority Index System (SPIS) is a method developed by ODOT for identifying hazardous locations on state highways, with the score based on three years of crash data, considering crash frequency, rate, and severity. ODOT bases its SPIS on 0.10-mile segments to account for variances in how crash locations are reported. This rating provides a general comparison of the overall safety of the highway based on crash information for all highway segments throughout the state.

According to ODOT 2015 SPIS ratings (data reported between 2012 and 2014), only one location was noted as being ranked among the top ten percent of hazardous locations. That location was on Highway 211 near the intersection with Day Hill Road. There were only three crashes in this area, but one resulted in serious injuries.

While performing the safety assessment, the Project Team understood that reported collisions served as a starting point. Crashes often go unreported. In other cases, crashes may not have occurred in part because the perceived uncomfortable or unsafe conditions may discourage people from walking and bicycling there in the first place.
Figure 7. Crash History (2011 to 2015)
Pedestrian Facilities

Walking plays a key role in Estacada’s transportation network, and planning for people walking helps the city provide a complete multi-modal transportation system. It also supports healthy lifestyles and addresses a social equity issue ensuring that the young, the elderly, and those not financially able to afford motorized transport have access to goods, services, employment, transit locations, and education.

Sidewalks are present on most streets in Estacada, but many deficiencies remain. Deficiencies commonly consist of gaps where no sidewalk is available, narrow sidewalk widths (4 feet or less), and segments in need of repair or maintenance. Full sidewalks (no gaps) are located along N Broadway Street and NE Main Street between NE 6th Avenue and Highway 211-224, and through most of the downtown area. However, along N Broadway Street between NE 1st Avenue and SW 2nd Avenue, full sidewalks are only located on the west side of the road. Newer residential neighborhoods have complete or nearly complete sidewalk networks. Deficiencies are present in many of the older residential neighborhoods, where sidewalks are often missing, narrow, or in disrepair. Figure 8 shows examples of typical sidewalk facilities found in older residential neighborhoods compared to newer ones constructed in the downtown. An inventory of existing pedestrian facilities is provided in Figure 9.

Furthermore, within Estacada, several marked crosswalks exist throughout the central area of the city. There is one crossing that uses a flashing beacon treatment located near Estacada High School along NE 6th Street between NE Main Street and NE Pierce Street. The traffic signal on Highway 211-224 at Broadway Street provides a protected crossing between the downtown and the riverfront. Other crossings of Highway 211-224 at SW 2nd Avenue and SW Wade Street have been facilitated by providing a refuge in the landscaped median, however, there are no other crosswalks, beacons, or signal devices to help with crossings.
Figure 9. Existing Pedestrian Facilities
**Bicycle Facilities**

Bicycling also plays a key role in the transportation system’s ability to support healthy lifestyles and provide a variety of travel choices beyond the motor vehicle. Biking trips are made for getting to and from school, shopping, commuting to work, and for travel to other activity generators in the city, as well as for recreational purposes. In comparison to walking, bicycling is more suitable for longer trips. Because Estacada’s city limits tend to be about one mile from end to end, the size of the city suggests that it is potentially very bike-able. To accommodate people biking, several bicycle parking locations are provided throughout the city (Figure 11).

Estacada also attracts regional bicycle trips because of the recent Cascading Rivers Scenic Bikeway designation on Highway 224 between Estacada and Detroit. There are plans to complete the Cazadero Trail in the future, which would attract even more recreational biking trips from the Portland Metro area.

Separate facilities for bicycles are not commonly present and on most streets people biking must share the travel lanes with motor vehicles. Bike lanes are present on Highway 211-224 through the downtown area (Figure 10), but for the remainder of the highway segments, only bike shoulders are available. The primary difference between a bike lane and a bike shoulder is that bike lanes are specifically designated for bicycle use and are marked with a bicycle stencil. Secondly, in Oregon, an eight-inch stripe delineates a bike lane compared to a four-inch stripe which is used for conventional shoulders. Per Oregon statute, motor vehicles are prohibited from traveling or parking in a designated bike lane. Bike shoulders are simply shoulders of adequate width for use by people biking. Estacada’s network of existing bicycle facilities is shown in Figure 11.

**Figure 10. Bike Lane on Highway 211-224**

[Image of bike lane on Highway 211-224]
Figure 11. Existing Bicycle Facilities

- **Existing Bike Lane (6 ft)**
- **SAM Stop**
- **Outside Urban Growth Boundary**
- **Existing Bike Shoulder**
- **Tri-Met Bus Stops**
- **City Limit**
- **Public Bike Parking**
- **Downtown**
- **Scenic Bikeway**
- **Park**
- **Existing Shared Use Path**
- **School**
Shared-Use Paths and Trails
Shared-use paths serve a variety of non-motorized travelers, including people walking and biking, skateboarders, and runners. Shared-use paths are typically paved (asphalt or concrete), but may also consist of an unpaved smooth surface as long as it meets Americans with Disabilities Act (ADA) standards. Shared-use paths are usually wider (e.g., 8-14 feet) than an average sidewalk (e.g., 5-6 feet). Lakeshore Trail is the only designated shared-use path in Estacada and can be seen in Figures 9 and 11. A photograph of a section of Lakeshore Trail is shown in Figure 12.

Figure 12. Lakeshore Trail Shared-use Path

There is one pedestrian trail located in Estacada through Ranger Woods. The entrance to the Ranger Woods Trail is located near the intersection of Cemetery Road and NE Hill Way. The trail leads to the High School parking lot. Figure 13 shows the entrance to the trail.

Figure 13. Ranger Woods Trail
OBJECTIVES
The following objectives guided the development of this plan:

- Develop and adopt an Estacada Active Transportation Plan as an update of Transportation System Plan Chapters 5 and 6, bicycle and pedestrian related chapters.
- Develop a plan for Estacada’s active transportation network to serve a broad variety of users, from the reluctant to the fearless, to enable safe bicycling and walking in the City to major destinations.
- Identify facility type and associated infrastructure improvement for specific routes.

In addition, project selection and prioritization criteria were developed and refined through engagement with project committees. The criteria include:

- Facility connects to major local destinations (parks, transit stops, activity centers)
- Addresses challenging street crossings
- Supports neighborhood connections to schools
- Filling network gaps
- Exposure to high vehicular traffic speeds and volumes
- Serves a wide range of users
- Right-of-way availability and natural resources impacts
- Community acceptance
- Feasibility (overall cost and impacts)
- Improves regional connections and tourism opportunities

DEVELOPING THE PLAN

Seven Core Active Transportation (CAT) routes were identified to represent the primary active transportation corridors within the city of Estacada (Figure 14). Improvements along these routes will help to connect the city and aid Estacada’s endeavor to become a healthy and active community. The following CAT routes were identified.

1. SW Lakeshore Drive Route and Timber Park to Downtown Route
2. SE 4th Avenue/SE Regan Hill Route
3. NE Pierce Street/NE Cemetery Road Route
4. Milo McIver State Park Route
5. North City Route
6. Highway 211–224 Route
7. NW Wade Street and NE Main Street Routes

The routes are organized into a complete network that converges on the downtown commercial district, but provides connections to all areas of the city. These CAT routes were identified based on City preferences and the access to essential destinations they provide. For each of the proposed routes, the posted speeds (or statutory where not posted), estimated average daily traffic volumes, typical right-of-way (ROW) widths, and typical pavement widths were identified to aid in the selection of appropriate improvements. While the routes represent the key corridors, the Project Team also identified improvements along other corridors throughout the community.
Figure 14. Core Active Transportation (CAT) Routes
CLASSIFICATIONS
This section summarizes the active transportation classification system and the associated facility types. The three classifications include Regional Facilities, Neighborhood Facilities, and Local Facilities. Figure 15 shows a breakdown of the active transportation classifications throughout the city. Each classification is described below, along with associated facility types. Example illustrations and design considerations for each facility treatment are also provided in this section.

**Regional Facility: Accommodates longer trips to and from locations outside the city.**

**Facility Types associated with Regional Facilities:**
- A – Separated Bike Lanes
- C – Shared-Use Path
- D – Shared Roadway
- G – Bike and Pedestrian Bridge

**Neighborhood Facility: Accommodates trips between Estacada’s central core and its outlying neighborhoods.**

**Facility Types associated with Neighborhood Facilities:**
- A – Separated Bike Lanes
- D – Shared Roadway
- E – Bike Lanes

**Local Facility: Accommodates intra-city trips within Estacada’s central core.**

**Facility Types associated with Local Facilities:**
- A – Separated Bike Lanes
- B – Bicycle Boulevard
- C – Shared-Use Path
- D – Shared Roadway
- E – Bike Lanes
FACILITY TYPE DESIGN GUIDANCE

A – Separated Bike Lanes

Separated bike lanes provide protection through physical barriers and can include flexible delineators, curbs, on-street parking or other barriers. Separated bike lanes can be at the same elevation as adjacent travel lanes or can be raised. Typically, separated bike lanes are applied on streets with high motor vehicle volumes, streets with intersection conflicts, and to create a safe and comfortable biking environment for all users. Pavement markings must be placed at the beginning of the separated bike lane and at intervals along the facility (MUTCD 9C.04). Figure 16 shows an example of a typical cross-section for a separated bike lane.

![Figure 16. Separated Bike Lanes](image)

B - Bicycle Boulevard

Bicycle boulevards are low-volume, low-speed streets modified to enhance bicycle safety and comfort by using design treatments such as signage, pavement markings, speed and/or volume reduction features, and crossing improvements. This treatment encourages through movements of people biking while discouraging similar through-trips by non-local motorized traffic. Typically, bike boulevards are applied parallel with and near thoroughfares and follow a desired line of travel for people biking.

Typical design features include:

- No centerline on the roadway
- Bicycle boulevard markings or shared lane markings (MUTCD 9C-9)
- Wayfinding signage should be used to identify bikeway network connections
- Minimal use of stop signs

Figure 17 shows an example of a typical treatment for a bicycle boulevard.

![Figure 17. Bicycle Boulevard](image)
C – Shared-Use Path

Shared-use paths can provide a desirable facility, particularly for recreation, and users of all skill levels who prefer separation from traffic. Typically, a shared-use path is applied in utility corridors, such as power lines and sewer corridors or along roadways. Dimensions for shared-use paths vary. Figure 18 shows an example of a typical treatment for a shared-use path.

![Figure 18. Shared-Use Path](source)

D – Shared Roadway

Shared roadways create a shared space for people biking and driving on streets. Sharrows are shared lane markings painted in a general travel lane that is used to encourage bicycle travel, highlight proper bike positioning within the lane, and alert drivers. Typically, a shared roadway is applied in constrained conditions and along roadways with speed limits of less than 35 mph. The sharrow can be placed in the middle of the lane or on the outside of a wide lane to promote bicycle travel to the right of the motor vehicle. For all conditions, sharrows should be placed outside of the door zone of parked cars. Further shared lane marking requirements can be found in the MUTCD (9C-9). Figure 19 shows an example of a typical treatment for a shared roadway.

![Figure 19. Shared Roadway](source)
E – Bike Lanes

Bike lanes designate exclusive space for people biking through the use of pavement markings and signs. The bike lane is located directly adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Typically, bike lanes are applied on any street with adequate spacing. However, bike lanes are most effective on streets with moderate traffic volumes (greater than 3,000 ADT is preferred) and speeds greater than 25 mph. Bicycle lanes should include a bicycle lane marking (MUTCD 9C-3) at the beginning of blocks and at regular intervals (MUTCD 9C.04).

In order to further separate conventional bike lanes from adjacent motor vehicle travel lanes and/or parking lanes, buffered bike lanes may be used. Typically, buffered bike lanes are considered anywhere a conventional bike lane is being created. Furthermore, a buffer is generally paired with a bike lane along roadways with higher speeds, higher motor vehicle volumes, or extra lanes/lane widths. Figure 20 shows an example of a typical treatment for a bike lane and an optional buffer.

F – Crossing Enhancements

The specific type of treatment at a crossing may range from a simple marked crosswalk to a full traffic signal or grade separated crossings. Crosswalk lines should not be used indiscriminately, and appropriate selection of crossing treatments should be evaluated. Consideration should be made for the number of lanes, presence of or lack of a median, the distance from adjacent signalized intersections, the pedestrian volumes and delays, the average daily traffic (ADT), the posted or statutory speed limit, the geometry of the location, the possible consolidation of multiple crossing points, the availability of street lighting, and other appropriate factors. Varied crossing enhancements have been proposed on a few of the CAT routes and are addressed in the next section of this ATP.
G – Bicycle and Pedestrian Bridge

Bicycle and pedestrian bridges are often used to provide trail access over natural features such as streams and rivers, where a culvert or boardwalk is not an option. The type and size of bridges can vary widely depending on the trail type and specific requirements. The clear width of the bridge should allow for two feet of clearance on each end of the pathway. A 54-inch guardrail should be used on the shared-use path where hazardous conditions exist. Figure 21 shows an example of a bicycle and pedestrian bridge.

Figure 21. Bicycle and Pedestrian Bridge

Source: Alta Planning + Design
ROUTES
This plan proposes active transportation facility types for each of the identified CAT routes. Each facility type is defined in detail, including typical design cross-sections, descriptions of key constraints, and additional required design elements (e.g. signing and striping). It should be noted that proposed design treatments on all CAT routes require further analysis, engineering studies, project development, and approval of the facility owner prior to construction.

ROUTE 1. SW LAKESHORE DRIVE AND TIMBER PARK TO DOWNTOWN ROUTE

Two routes were identified as CAT route alignments. Both connect Timber Park and the Lakeshore Trail to the downtown commercial district. Both routes are proposed and the purpose of these routes is to provide the residents of Estacada a safe walking/cycling route connecting from downtown, across Highway 211-224, and to the recreational opportunities along the riverfront. Fast speeds and high traffic volumes require more protection for people walking and biking. The facility types proposed include a shared roadway along Lakeshore Drive, conventional bike lanes with buffers along the highway portion, bike lanes along SW Wade Street, a shared roadway along SW 3rd Avenue, and upgrading the shared-use path (Lakeshore Trail). To provide low-stress connections, the intersections of Highway 211-224/SW 2nd Avenue and Highway 211-224/SW Wade Street (SW Elm Road) will require crossing enhancements. Lastly, both route improvements propose including improved and completed ADA compliant sidewalks where needed. Figure 22 shows the CAT routes and the proposed facility treatments.

1 The city should be aware sidewalk obstructions (e.g. utility poles or signs) in a five foot curb-tight sidewalk generally create a pinch point that does not provide minimum clear width.
BENEFITS INCLUDE

- Includes a low-cost improvement on Highway 211-224, with only restriping required.
- Widens Lakeshore Trail to comfortably accommodate more users and make it easier to pass.
- Provides a safer walking environment by construction and/or completing sidewalks.
- Creates an opportunity to draw regional cyclists into downtown from the highway.
- Provides safe walking and cycling route connection from the downtown area, across Highway 211-224, to recreational opportunities along the riverfront.

POTENTIAL IMPACTS

- Parking will need to be removed on the east side of SW Wade Street and on one side of SW Beech Road.
- Street tree wells are too narrow along SW 3rd Avenue and will need to be widened.
- Sidewalks will need to be widened on the west side of SW Beech Road (blockages are caused by poles in the middle of the sidewalks).
- Slightly narrower lanes or median will be required along the highway.

For each portion of these CAT routes, designated cross-sections (Figures 23–29) have been created to further describe the proposed facility treatments. Furthermore, field work was conducted to identify existing key deficiencies. It should be noted that additional analysis and an engineering study will be necessary prior to approval and construction.

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2 A design exception from ODOT may be required to implement the proposed highway cross-section.
EXISTING DEFICIENCIES INCLUDE

- Right-of-Way:
  - All 6 ramps include tactile domes
  - 7 ramps perpendicular to street, 5 at corners
  - Curb ramps present at 6 out of 7 needed locations
  - Curb ramps:

- Landscape strips:
  - Left, right and center landscape strips are present south of SW 2nd Avenue, except where there is the southbound left turn lane

- Sidewalks:
  - 1500 feet east side of Highway 211-224, north of SW 2nd Avenue
  - No buffer or physical separation from motor vehicles

- Curb ramps:
  - 1 ramp perpendicular to street, 5 at corners
  - Curb ramps present at 6 out of 7 needed locations

- Bike facilities:
  - Conventional bike lanes exist in both directions
  - Bike lane pavement markings are faded north of SW 2nd Avenue

- Gaps:
  - 100 feet east side of Highway 211-224, north of SW 2nd Avenue

- Landscape strip:
  - Landscape strips:

- Buffer strip:
  - 6 feet

PROPOSED TYPICAL DESIGN TREATMENTS

Figure 23: Route 1a, Highway 211-224 (Oak Road to Wade Street)
EXISTING DEFICIENCIES INCLUDE

General cross section deficiencies:
- Currently there is parking on both sides of the street—parking would be removed on east side of street

Bicycle facilities:
- No current bike facility

Sidewalks:
- No sidewalk gaps or deficiencies

Landscape strip:
- No landscape strip present on either side of the road

CURB RAMPS:
- Curb ramps present at 2 out of 4 needed locations
  - 2 ramps are perpendicular to the street
  - None include tactile domes

Right-of-Way:
- There are no right-of-way deficiencies

PROPOSED TYPICAL DESIGN TREATMENTS

Figure 25. Route 1a. SW 3rd Avenue (Wade Street to Broadway Street)

EXISTING DEFICIENCIES INCLUDE

Bicycle facilities:
- No current bike facilities

Sidewalks:
- No sidewalk gaps or deficiencies

Landscape strip:
- 2-2.5 feet tree wells present as landscape strip, deficient width.

CURB RAMPS:
- Curb ramps present at all 12 needed locations
  - 4 ramps are perpendicular to the street, 8 at corners
  - 4 ramps include tactile domes

Right-of-Way:
- There are no right-of-way deficiencies

PROPOSED TYPICAL DESIGN TREATMENTS
PROPOSED TYPICAL DESIGN TREATMENTS

Figure 26. Route 1b. Lakeshore Trail

EXISTING DEFICIENCIES INCLUDE

Trail or Shared-Use path:
- Present: No buffer between shared-use path and roadway
- Pavement is in disrepair: many uplifts caused by tree roots pushing through the pavement
- Narrow facility (currently 6 feet wide)

Right-of-Way:
- There are no right-of-way deficiencies

PROPOSED TYPICAL DESIGN TREATMENTS

Figure 27: Route 1b. SW Lakeshore Drive (Oak Road to Beech Road)

EXISTING DEFICIENCIES INCLUDE

Bicycle facilities:
- No bike facility present beyond shared-use path, which is too narrow

Sidewalks:
- No sidewalk gaps or deficiencies

Curb ramps:
- Curb ramps present at 36 out of 42 needed locations
- 14 ramps are perpendicular, 22 at corners
- 4 ramps include tactile domes

Right-of-Way:
- There are no right-of-way deficiencies
**EXISTING DEFICIENCIES INCLUDE**

**General cross section deficiencies:**
- Parking is currently on both sides of the street

**Bicycle facilities:**
- No current bike facilities

**Sidewalks:**
- No sidewalk gaps
- Sub-standard width – blockages caused by telephone poles in the middle of the sidewalk on west side of street

**Landscape strip:**
- No landscape strip is present

**Curb ramps:**
- Curb ramps present at 5 of 12 needed locations
- 5 at corners
- 5 ramps include tactile domes

**Right-of-Way:**
- There are no right-of-way deficiencies

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**EXISTING DEFICIENCIES INCLUDE**

**Bicycle Facilities:**
- No current bike facilities.

**Right-of-Way:**
- There are no right-of-way deficiencies
ROUTE 2. SE 4TH AVENUE/SE REGAN HILL ROUTE

SE 4th Avenue/SE Regan Hill Road was identified as a CAT route to connect residential areas in eastern Estacada to schools and the downtown commercial district. Facility types include conventional bike lanes along SE Regan Hill Road, a conventional bike lane with a buffer along the south side (uphill) of SE 4th Avenue east of SE Shafford Avenue, a shared roadway on the north side (downhill) of SE 4th Avenue east of SE Shafford Avenue, and a shared roadway along SE 4th Avenue west of SE Shafford Avenue. Lastly, sidewalks along this entire route will be improved and completed in compliance with ADA standards where needed.

A supplemental CAT route along NE Carole Street and NE Oakview Drive was created to better connect residents north of SE 4th Avenue to the schools. A shared roadway is recommended along with sidewalk infill constructed to local street standards. This route can be seen in Table 3: Additional Active Transportation Projects (project 25). Figure 30 shows the CAT route and the proposed facility treatments.

Figure 30. CAT Route 2. SE 4th Avenue/SE Regan Hill Route

**BENEFITS INCLUDE**

- Connects residential area in eastern Estacada to schools and the downtown area.
- Creates a safer, lower-stress environment for people biking to traverse the steep hill along SE 4th Avenue.
- Provides a safer walking environment by construction and/or completing sidewalks.

**POTENTIAL IMPACTS**

- Parking will need to be removed on the south side of SE 4th Avenue.
- Street tree wells along SE 4th Avenue (Broadway Street to SE Shafford Avenue) will need to be widened.

For each portion of this CAT route, designated cross-sections (Figures 31–33) have been created to further describe the proposed facility treatments. Furthermore, field work was conducted to identify existing key deficiencies.
PROPOSED TYPICAL DESIGN TREATMENTS

Figure 31. Route 2. SE Regan Hill Road

EXISTING DEFICIENCIES INCLUDE

Bicycle facilities:
- No current bike facilities

Sidewalks:
- Gaps: 4100 feet total
  - 2050 feet on each side (entire segment)

Curb ramps:
- Curb ramps present at none of 12 needed locations

Right-of-Way:
- There are no right-of-way deficiencies

PROPOSED TYPICAL DESIGN TREATMENTS

Figure 32. Route 2. SE 4th Avenue (Shafford Avenue to Bryant Road)

EXISTING DEFICIENCIES INCLUDE

Bicycle facilities:
- No current bike facilities

Sidewalks:
- Gaps: 2225 feet total
  - 625 feet south side of street from SE Regan Hill Road junction
  - 825 feet north side of street from SE Shafford Avenue to the east
  - 775 feet south side of street from SE Shafford Avenue to just west of SE Oak View Lane

Curb ramps:
- Curb ramps present at 6 out of 20 needed locations
  - All 6 ramps at corners
  - 5 ramps include tactile domes

Right-of-Way:
- There are no right-of-way deficiencies
PROPOSED TYPICAL DESIGN TREATMENTS

Figure 33. Route 2. SE 4th Avenue (Broadway Street to Shafford Avenue)

EXISTING DEFICIENCIES INCLUDE

**Bicycle facilities:**
- No current bike facilities

**Sidewalks:**
- No sidewalk gaps or deficiencies

**Landscape strip:**
- No landscape strip present

**Curb ramps:**
- Curb ramps present at 7 out of 11 needed locations
- 2 ramps perpendicular to the street, 5 at corners
- 6 ramps include tactile domes

**Right-of-Way:**
- There are no right-of-way deficiencies
ROUTE 3. NE PIERCE STREET/NE CEMETERY ROAD ROUTE

The NE Pierce Street/NE Cemetery Road route was identified as a CAT route to connect residential areas to the north and northeast to schools and the downtown commercial district. Facility types include conventional bike lanes along NE Cemetery Road north of NE Cascadia Ridge Drive, a conventional bike lane with a buffer along the east side of NE Cemetery Road (uphill) south of NE Cascadia Ridge Drive, a shared roadway on the west side of NE Cemetery Road (downhill) south of NE Cascadia Ridge Drive, separated bike lanes along NE 6th Avenue, and a shared roadway along NW Pierce Street through to SE Shafford Avenue. To accommodate the upgrades, the street bridge along NE 6th Avenue (between NE Pierce Street and NE Cemetery Road) will be widened to include bicycle and pedestrian facilities on each side. Sidewalks along all routes will be improved and completed in compliance with ADA standards where needed. Figure 34 shows the CAT route and the proposed facility treatments.
**Benefits Include**

- Connects residential area to the north and northeast to schools and the downtown area.
- Bicycle treatments provide a safer environment for people biking who are climbing/descending the hill along NE Cemetery Road.
- Widening the 6th Avenue bridge over Wade Creek mitigates a key constraint.
- Provides a safer walking environment by constructing and/or completing sidewalks.

**Potential Impacts**

- Reconstruction may be required for the NE Cemetery Road portion of the route south of NE Cascadia Ridge Drive.
- NE 6th Avenue will need to be widened to incorporate the pedestrian bridge.
- Parking may need to be removed along NE 6th Avenue. The City shall work together with the School District to determine how planned improvements on NE 6th Avenue might impact parking for events on School District property and to identify potential parking solutions or alternative designs that balance the needs for parking and people biking.
- Reconstruction will be required for sidewalk and landscape strips along NE Pierce Street.

For each portion of this CAT route, designated cross-sections (Figures 35–38) have been created to further describe the proposed facility treatments. Furthermore, field work was conducted to identify existing key deficiencies.

**Proposed Typical Design Treatments**

Figure 35. Route 3. NE Cemetery Road Portion (North of NE Cascadia Ridge Drive)

*Landscape Strip*

**Existing Deficiencies Include**

**Bicycle Facilities:**
- No current bike facilities

**Sidewalks:**
- **Gaps present:** 950 feet west side from NE Cascadia Ridge Drive to north end of route
- No surface or width deficiencies

**Landscape Strip:**
- No landscape strip present

**Curb Ramps:**
- Curb ramps present at 2 our of 4 needed locations
- 2 ramps at corners
- 2 ramps include tactile domes

**Right-of-Way:**
- There are no right-of-way deficiencies
PROPOSED TYPICAL DESIGN TREATMENTS

Figure 36. Route 3. NE Cemetery Road Portion (South of NE Cascadia Ridge Drive)

EXISTING DEFICIENCIES INCLUDE

Bicycle facilities:
- No bike facilities present

Sidewalks
- **Gaps:** 2460 feet total
  - 1020 feet on west side of street from to NE Cascadia Ridge Drive
  - 1440 feet on east side from NE 6th Avenue to NE Hill Way
- No surface or width deficiencies

**Landscape Strip**
**Buffer**

PROPOSED TYPICAL DESIGN TREATMENTS

Figure 37. Route 3. NE 6th Avenue (Pierce Street to Cemetery Road)

EXISTING DEFICIENCIES INCLUDE

Bicycle facilities:
- No current bike facilities

Sidewalks
- **Gaps:** 160 feet total
  - 80 feet both sides of the roadway starting from Cemetery Road and NE 6th Avenue
- No width or surface deficiencies

**Buffer with Flexible Delineator**

Curb ramps:
- Curb ramps present at 4 out of 6 needed locations
  - 2 ramps perpendicular to street, 2 at corners
  - 4 ramps include tactile domes

Right-of-Way:
- There are no right-of-way deficiencies
PROPOSED TYPICAL DESIGN TREATMENTS

Figure 38. Route 3. NE Pierce Street, SE 3rd Avenue (Pierce Street to Shafford Avenue), and Shafford Avenue (SE 3rd Avenue to SE 4th Avenue)

EXISTING DEFICIENCIES INCLUDE

Bicycle facilities:
- No current bike facilities

Sidewalks:
- **Gaps:** 2105 feet total
- **SE Shafford Avenue**
  - 105 feet on southwest side from SE 4th Avenue to SE 3rd Avenue
- **SE 3rd Avenue between SE Shafford Avenue and SE Pierce Street**
  - 120 feet north side
- **SE and NE Pierce Street**
  - SE 3rd Avenue to SE 2nd Avenue: 330 feet west side, 300 feet east side
  - SE 2nd Avenue to NE 1st Avenue: 150 feet east and west side
  - NE 1st Avenue to NE 2nd Avenue: 150 feet west side, 230 feet east side
  - NE 2nd Avenue to NE 3rd Avenue: 250 feet east side
  - NE 3rd Avenue to NE 5th Avenue: 175 feet east side
  - NE 5th Avenue to NE 6th Avenue: 125 feet east side
  - Surface sidewalk deficiencies on southwest side of SE Shafford Avenue from SE 4th Avenue to 3rd Avenue

Landscape strip:
- No landscape strip present

Curb ramps:
- Curb ramps present at 4 out of 28 needed locations
  - 4 at corners
  - None of the ramps include tactile domes

Right-of-Way:
- There are no right-of-way deficiencies
ROUTE 4. MILO MCIVER STATE PARK ROUTE

Milo McIver State Park represents a unique local and recreational destination. However, pedestrian and bicycle access from Estacada is poor and a significant amount of out-of-direction travel is required. The Milo McIver State Park Route creates a comfortable and convenient active transportation connection between this recreational destination and the city with a new bike and pedestrian bridge over the Clackamas River and an improved Lakeshore Trail. Exact placement of the pedestrian bridge is to be determined through collaboration with the State Park. When paired with the Timber Park to Downtown Route (1a), a walking trip between the State Park and the downtown could be made in under 30 minutes.

Figure 39 shows the CAT route and the proposed facility treatments.
BENEFITS INCLUDE

- Creates a comfortable and convenient transportation connection between recreational sites such as Milo McIver State Park and Timber Park and the city with a new bike/pedestrian bridge over the Clackamas River.
- Creates both a regional and local connection to Milo McIver State Park.
- Creates a low-stress transportation route for accessing the industrial area surrounding Park Avenue.

POTENTIAL IMPACTS

- Existing shared-use path will need to be widened.
- Use of Portland General Electric right-of-way will be required.

For each portion of this CAT route, designated cross-sections (Figures 40–41) have been created to further describe the proposed facility treatments. Furthermore, field work was conducted to identify existing key deficiencies. The relationship between the shared-use path and Highway 211-224 (where the shared-use path parallels the highway) can be seen in Route 6 (Figure 53).

PROPOSED TYPICAL DESIGN TREATMENTS

**Figure 40. Route 4. Milo McIver Route – Entire Route**

**DEFICIENCIES INCLUDE**

Trail or shared-use path:
- Shared-use path exists along the proposed route
- Numerous instances of root damage
- Deficient width: currently path is 8 feet wide

Right-of-Way:
- Requires the use of Portland General Electric right-of-way

**PROPOSED TYPICAL DESIGN TREATMENTS**

**Figure 41. Route 4. Milo McIver Route – Bicycle and Pedestrian Bridge over the Clackamas River**

**DEFICIENCIES INCLUDE**

- Location will be determined through collaboration with the State Parks Department
ROUTE 5. NORTH CITY ROUTE

The North City Route was identified to connect the
downtown network to all the other sequential CAT routes,
and to provide a walkable, bike-able loop route for exercise
and recreation. The facility types include separated bike
lanes along SE River Mill Road, SE Eagle Creek Road,
and NW 6th Avenue. Furthermore, a shared roadway is
proposed along N Broadway Street and a bike boulevard
is proposed along NE 2nd Avenue. Crossing enhancements
are proposed to improve access and safety to the schools
(two intersections along SE 6th Avenue) and the library and
skate park (NW 10th Avenue). Sidewalks along all routes
will be improved and completed in compliance with ADA
standards where needed.

Figure 42 shows the CAT route and the proposed facility
treatments.
At the intersection of SE Eagle Creek Road/NW 10th Avenue, an enhanced crossing is necessary to help people walking and biking cross the high-volume street safely. Furthermore, this intersection directly connects the northern schools and activity generators including the library and the skate park. Due to the high speeds and volume along this route (SE Eagle Creek Road), one proposed design treatment includes a marked crosswalk adjoined with a median refuge and warning signage. Figure 43 shows an example of a marked crosswalk and the proposed warning signage.

Figure 43. Marked Crosswalk

An additional pedestrian crossing enhancement is proposed at the intersection of NW Main Street/NE 6th Avenue. This intersection provides a key connection from the northern schools to the southern schools and the downtown area. A marked crosswalk with warning signage is a potential crossing treatment. Furthermore, another proposed design treatment includes minimizing the curb radii on the southwest corner. The size of a curb's radius can have a significant impact on pedestrian comfort and safety. A smaller curb radius provides more pedestrian area at the corner, allows more flexibility in the placement of curb ramps, shorter crossing distance, and requires vehicles to slow more on the intersection approach. The radius may be five feet where there is adequate street width and a larger effective turning radius created by parking or bike lanes. Figure 44 shows an example of minimizing curb radii.

Figure 44. Minimizing Curb Radii

Finally, to enhance the intersection of NE 6th Avenue and NW Wade Street/Eagle Creek Road, installing a curb and sidewalk and minimizing the curb radii should be considered as a proposed design treatment. This intersection provides direct connections from activity generators such as the skate park and library to the surrounding schools and downtown area. It should be noted that all proposed design treatments will require additional analysis and an engineering study. For each portion of this CAT route, designated cross-sections (Figures 45–50) have been created to further describe the proposed facility treatments. Furthermore, field work was conducted to identify existing key deficiencies.
BENEFITS INCLUDE

- Connects to all other CAT routes and completes a walkable, bike-able loop route for exercise and creation.
- Provides a safer connection between the industrial area and the city.
- Enhances school crossings.
- Enhances access to the Library and Wade Creek City Park.
- Provides a safer and lower stress environment for people biking by creating separation from vehicular traffic.
- Creates a safer environment for people walking by constructing and/or completing sidewalks.
- Improves pedestrian comfort and safety at intersections on NW 6th Avenue with NW Wade Street/Eagle Creek Road, and on NE 6th Avenue with NW Main Street.
- Creates both a regional and local connection.

POTENTIAL IMPACTS

- SE River Mill Road will need to be widened to include shoulders.
- NW Wade Street will need to be widened to include a center turn lane.
- Sidewalks will need to be widened along NW 6th Avenue and N Broadway Street (SE 4th Avenue to NW 6th Avenue).
- Right-of-way will need to be acquired along SE River Mill Road.
- Parking may need to be removed along NE 6th Avenue. The City shall work together with the School District to determine how planned improvements on NE 6th Avenue might impact parking for events on School District property and to identify potential parking solutions or alternative designs that balance the needs for parking and people biking.

PROPOSED TYPICAL DESIGN TREATMENTS

Figure 45. Route 5. SE River Mill Road

EXISTING DEFICIENCIES INCLUDE

General cross section deficiencies:
- No roadway shoulders

Bicycle facilities:
- No current bike facilities

Sidewalks:
- There are no sidewalks: 1390 feet north and south sides of the street (entire route)

Curb ramps:
- Curb ramps present at none out of 4 needed locations

Right-of-Way:
- 40 out of 60 feet of needed right-of-way is available
PROPOSED TYPICAL DESIGN TREATMENTS

Figure 46. Route 5. NW Wade Street/SE Eagle Creek Road (River Mill Road to NW 6th Avenue)

EXISTING DEFICIENCIES INCLUDE

General cross section deficiencies:
- No center turn lane

Sidewalks:
- **Gaps:** 1.15 miles
- **Wade Street:** 640 feet east side from NW 6th Avenue to Altramar II (mobile home park); 210 feet west side from NW 6th Avenue to NW 10th Avenue (two separate gaps)
- **Eagle Creek Road:** 1130 feet east side from NW 10th Avenue to Hill Way; 900 feet west side from NW 10th Avenue to Hill Way; 1600 feet east and west side from Hill Way to SE River Mill Road
- No surface or width deficiencies

Bicycle facilities:
- No current bike facilities

Curb ramps:
- Curb ramps present at 7 out of 28 needed locations
- 2 ramps perpendicular to street, 5 at corners
- 2 ramps include tactile domes

Right-of-Way:
- There are no right-of-way deficiencies
PROPOSED TYPICAL DESIGN TREATMENTS

Figure 47. Route 5. NW 6th Avenue (Wade Street/Eagle Creek Road to Pierce Street)

EXISTING DEFICIENCIES INCLUDE

**Bicycle facilities:**
- No current bike facilities

**Sidewalks:**
- **Gaps:** 640 feet north side from N Broadway Street to NW Wade Street
- Sub-standard width
- Pole obstructing most of the sidewalk on southwest side at NE Shafford Avenue

**Curb ramps**
- Curb ramps present at 7 out of 16 curb ramps
- 6 ramp at corners, 1 is a depressed corner
- 2 ramps include tactile domes

**Right-of-Way:**
- There are no right-of-way deficiencies

PROPOSED TYPICAL DESIGN TREATMENTS

Figure 48. Route 5. NE 2nd Avenue (Broadway Street to Shafford Avenue)

EXISTING DEFICIENCIES INCLUDE

**Bicycle facilities:**
- No current bike facility

**Sidewalks:**
- **Gaps:** 480 feet total
  - 80 feet south side from NE Shafford Avenue to NE Pierce Street
  - 400 feet south side from 10th (alley) to NE Main Street
- No surface or width deficiencies

**Landscape strip:**
- Landscape strip only exists on north side in front of school

**Curb ramps:**
- Curb ramps present at 10 out of 15 needed locations
- 1 ramp perpendicular to street, 9 at corners
- 5 ramps include tactile domes

**Right-of-Way:**
- There are no right-of-way deficiencies
EXISTING DEFICIENCIES INCLUDE

**Bicycle facilities:**
- No current bike facilities

**Sidewalks:**
- No sidewalk gaps
- **Sub-standard width:** West side from NE/NW 1st Avenue to NE/NW 2nd Avenue
- **Surface in poor condition:** West side from NE/NW 1st Ave to NE/NW 2nd Avenue

**Landscape strip:**
- No landscape strip present

**Curb ramps:**
- Curb ramps present at 14 out of 20 needed locations
- 13 at corners, 1 at a depressed corner
- 1 ramp includes tactile domes

**Right-of-Way:**
- There are no right-of-way deficiencies

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EXISTING DEFICIENCIES INCLUDE

**Bicycle facilities:**
- No current bike facilities

**Sidewalks:**
- Gaps
- 300 feet from SW 2nd Avenue to SW 1st Avenue
- Sub-standard width
- Narrow width from SW 2nd Avenue to SW 1st Avenue (on west side)

**Landscape strip:**
- No landscape strip or street trees from 2nd to 1st

**Curb ramps:**
- Curb ramps present at 10 out of 12 needed locations
- 10 ramps perpendicular to street
- 10 ramps include tactile domes

**Right-of-Way:**
- There are no right-of-way deficiencies
ROUTE 6. HIGHWAY 211-224 ROUTE

Highway 211-224 carries the highest traffic volumes and speeds of any transportation corridor in the city and separates the downtown from the riverfront. The improvements proposed for the Highway 211-224 Route enhance safety through conventional bike lanes with buffers, sidewalk infill, and a series of enhanced crossings. It should be noted that buffered bike lanes will require additional approval from the State Traffic Engineer. Design guidance can be found in the Oregon Bicycle and Pedestrian Design Guide. Furthermore, it is proposed that ADA compliant sidewalks along this route be improved/completed where needed as development occurs.

As part of a future comprehensive plan update, the City may adopt a policy to express their interest in exploring the opportunity for ODOT to consider and the Oregon Transportation Commission (OTC) to adopt a Special Transportation Area (STA) designation for the downtown area. The purpose of an STA is to provide access to and circulation among community activities, businesses and residences and to accommodate pedestrian, bicycle, and transit movements along and across the highway. An STA designation may allow for different design standards along the highway that are more conducive to active transportation. Furthermore, it may result in lower speeds. Lastly, in the future more robust treatments such as separated bike lanes along the highway may be considered.

Figure 51 shows the CAT route and the proposed facility treatments.

---

3 ODOT Highway Design Manual, 2012
4 Developer is responsible for providing sidewalks along the highway as development occurs. Where the Cazadero Trail parallels the highway (north of Timber Park), sidewalks will not be required.
5 Oregon Highway Plan.
6 ODOT Highway Design Manual (6.2.2 Special Transportation Areas).
Specific designs on highway crossing treatments are to be determined at the time of project development and are subject to ODOT engineering studies and approval by the Region Traffic Engineer. Estacada City staff will need to submit a formal request to ODOT for all treatments to state highways proposed in this plan. Pedestrian crossing enhancements are proposed at two identified intersections along Highway 211-224.

One proposed design treatment includes a Pedestrian Hybrid Beacon. A Pedestrian Hybrid Beacon is a traffic control device used to help pedestrians safely cross high speed or high volume roadways at mid-block crossings or uncontrolled intersections. According to the MUTCD, on major roadways with a designated speed limit of 35 mph or less, total vehicles per hour (VPH) greater than 500 vehicles, and at least 20 people crossing per hour, a Pedestrian Hybrid Beacon is warranted. A full warrant analysis would need to be conducted prior to approval and construction. Furthermore, the MUTCD requires a CROSSWALK STOP ON RED (R10-23) sign mounted adjacent to a pedestrian hybrid beacon face on each major street approach. Further guidelines can be found in the MUTCD and in the ODOT Traffic Manual (6.6.7 Pedestrian Activated Warning Lights). Figure 52 shows an example of Pedestrian Hybrid Beacon.

At the intersection of Highway 211-224 and Broadway Street, there is currently a traffic signal. A further proposed design treatment includes a signal timing modification with a leading pedestrian interval. A leading pedestrian interval provides people walking a three to seven second head start when entering an intersection ahead of the green signal for motor vehicles traveling in the same direction. This may require the addition of a new controller.

At the intersection of Hwy 211-224 and SE River Mill Road a final proposed design treatment includes illuminating the intersection and adding sidewalks per the cross-section described below. As a direct connection to the industrial area with heavy vehicle traffic, increased crossing safety is necessary. Standards and guidelines can be found in the ODOT Lighting Policy and Guidelines Manual. Further crossing enhancements should be considered as redevelopment occurs.

For each portion of this CAT route, a designated cross-section (Figures 53–54) has been created to further describe the proposed facility treatments. Furthermore, field work was conducted to identify existing key deficiencies. It should be noted that additional analysis and an engineering study will be necessary prior to approval and construction.

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7 All enhanced crossing treatments will require an engineering study and State Traffic Engineer approvals. For all signal modifications, the city will need to submit a formal request with ODOT.

8 A Design Exception from ODOT will be required to implement the proposed cross-sections, which include non-standard elements.
**BENEFITS INCLUDE**

- Creates a comfortable and convenient connection between sites such as Milo McIver State Park and Timber Park and the city.
- Provides an opportunity to draw regional cyclists into the downtown from the highway.
- Includes a low-cost improvement on Highway 211-224 for improving comfort for people who bike.
- Improves pedestrian crossings on the highway at four locations.
- Provides a safer environment for people walking by constructing and/or completing sidewalks.
- Creates a low-stress route for accessing the industrial area surrounding Park Avenue.

**POTENTIAL IMPACTS**

- Highway will need to be widened north of Timber Park to add a center turn lane, bike lanes, and sidewalks. This will likely happen as the area develops.
- Right-of-way may need to be acquired north of SW 2nd Avenue.
- Slightly narrower lanes or median will be required along the highway.
EXISTING DEFICIENCIES INCLUDE:

- General cross section deficiencies
- Intermittent center line lane
- No separation
- Deficient width or separation
- Striping bike lane starting at Industrial Way just north of ranger station
- Curb ramps present at 3 out of 28 needed locations
- No landscaping strip in northern half of route
- No landscape strip in northern half of route
- ** Gravel Shoulder
- Raised Curb Median & Turn Lanes
- Shared-use path (Figure 40)

PROPOSED TYPICAL DESIGN TREATMENTS

Figure 53. Route 6: Highway 211-224 Route – North of Timber Park to North Urban Growth Boundary

Figure 54. Route 6: Highway 211-224 Route – South of Timber Park to Southeast Urban Growth Boundary

- No surface or width deficiencies
- 1.5 miles side 1.5 miles
- Sidewalks
- No separation
- Deficient width or separation
- Stripe bike lane starting at Industrial Way just north of ranger station
- Curb ramps present at 3 out of 28 needed locations
- No landscaping strip in northern half of route
- No landscape strip in northern half of route
- ** Gravel Shoulder
- Raised Curb Median & Turn Lanes
- Shared-use path (Figure 40)

PROPOSED TYPICAL DESIGN TREATMENTS

Figure 54. Route 6: Highway 211-224 Route – South of Timber Park to Southeast Urban Growth Boundary

- No surface or width deficiencies
- 1.5 miles side 1.5 miles
- Sidewalks
- No separation
- Deficient width or separation
- Stripe bike lane starting at Industrial Way just north of ranger station
- Curb ramps present at 3 out of 28 needed locations
- No landscaping strip in northern half of route
- No landscape strip in northern half of route
- ** Gravel Shoulder
- Raised Curb Median & Turn Lanes
- Shared-use path (Figure 40)
ROUTE 7. NW WADE STREET AND NE MAIN STREET ROUTES

NW Wade Street and NE Main Street were identified as CAT routes to connect the northern portion of the city to the southern portion of the city while considering the steep grade that divides them. The facility types considered include a bike boulevard along NW Wade Street and NW 1st Avenue, conventional bike lanes along NE Main Street from NE 2nd Avenue to SE 3rd Avenue, a conventional bike lane along the west side of NE Main Street from NE 6th Avenue to NE 2nd Avenue, and a separated bike lane along the east side of NE Main Street from NE 6th Avenue to NE 2nd Avenue. Sidewalks along both routes will be improved and completed where needed. Figure 55 shows the CAT routes and the proposed facility treatments.

**Figure 55. CAT Route 7: NW Wade Street and NE Main Street Routes**

**BENEFITS INCLUDE**
- Provides additional connection for people walking and biking in and around downtown.
- Connects schools to residential areas and the downtown area.
- Creates low-stress environments for people biking by designating bike boulevards and bike lanes.
- Creates a safer environment for people walking by constructing and/or completing sidewalks.

**POTENTIAL IMPACTS**
- Will require reconstruction along NW Wade Street.
- Will require significant reconstruction along NE Main Street.
- Angled parking will need to be converted to parallel parking along NE Main Street.

For each portion of these CAT routes, a designated cross-section (Figures 56-59) has been created to further describe the proposed facility treatments. Furthermore, field work was conducted to identify existing key deficiencies.
PROPOSED TYPICAL DESIGN TREATMENTS

Figure 56. Route 7a. NW Wade Street Route – Entire Route and NW 1st Avenue (NW Wade Street to N Broadway Street)

EXISTING DEFICIENCIES INCLUDE

**Bicycle facilities:**
- No current bike facilities

**Sidewalks:**
- **Gaps:** 2105 feet total
- **NW 1st Avenue to NW 2nd Avenue:** 260 feet west side
- **NW 2nd Avenue to NW 3rd Avenue:** 33 feet east side; 264 west side
- **NW 3rd Avenue to NW 4th Avenue:** 340 feet west side; 230 feet east side
- **NW 4th Avenue to NW 5th Avenue:** 330 feet west side
- **NW 5th Avenue to NW 6th Avenue:** 360 feet west side; 288 feet east side
- **Surface in poor condition**
- **NW 1st Avenue to SW 2nd Avenue (east side is in poor condition)**

**Landscape strip:**
- No landscape strips present

**Curb ramps:**
- Curb ramps present at 2 out of 20 needed locations
- 2 ramps at corners
- 1 ramp includes tactile domes

**Right-of-Way:**
- There are no right-of-way deficiencies
PROPOSED TYPICAL DESIGN TREATMENTS

Figure 57. Route 7b. NE Main Street Route – (NE 6th Avenue to NE 2nd Avenue)

*Physical Buffer*

Figure 58. Route 7b. NE Main Street Route – (NE 2nd Avenue to NE 1st Avenue)

*Street Tree*

Figure 59. Route 7b. NE Main Street Route (NE 1st Avenue to SE 3rd Avenue)
EXISTING DEFICIENCIES INCLUDE

General cross section deficiencies:
- Angled parking from NE 2nd Avenue to NE 1st Avenue (west side)
- Steep grade

Bicycle facilities:
- No current bike facilities

Sidewalks
- No sidewalk gaps.
- No surface or width deficiencies

Landscape strip:
- Landscape strip on the east side with street trees from NE 6th Avenue to NE 1st Avenue (absent on west side)

Curb ramps:
- Curb ramps present at 20 out of 22 needed locations
- 2 ramps perpendicular to the street, 18 at corners
- 9 include tactile domes

Right-of-Way:
- Right-of-way may need to be acquired in some areas
PROJECTS
This section summarizes proposed projects, including the prioritization process, costs, and funding considerations. It should be noted that all proposed projects will require further analysis and an engineering study prior to approval and construction.

**PRIORITIZATION CRITERIA PROCESS**

The proposed project selection and prioritization criteria for the Estacada Active Transportation Plan is in Table 1 below. The qualitative measures included were discussed and refined with project committees. The final criteria were used to develop and prioritize the CAT projects in the final Plan. Criteria are scored on a scale from 0 (least effective) to 4 (most effective), with proposed scoring considerations included in the table.

**Table 1. Active Transportation Project Selection and Prioritization Criteria**

<table>
<thead>
<tr>
<th>EVALUATION CRITERIA</th>
<th>SCORING (POTENTIAL SCORE OF 0, 1, 2, 3, OR 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility connects to major local destinations (parks, transit stops, activity centers)</td>
<td>4 Significantly improves access to major local destinations</td>
</tr>
<tr>
<td></td>
<td>2 Moderately improves access to major local destinations</td>
</tr>
<tr>
<td></td>
<td>0 Does not enhance access to major local destinations</td>
</tr>
<tr>
<td>Addresses challenging street crossings</td>
<td>4 Significantly improves quality and/or number of street crossings for people walking and/or biking</td>
</tr>
<tr>
<td></td>
<td>2 Moderately improves quality and/or number of street crossings for people walking and/or biking</td>
</tr>
<tr>
<td></td>
<td>0 Does not improve quality and/or density of street crossings for people walking and/or biking</td>
</tr>
<tr>
<td>Supports neighborhood connections to schools</td>
<td>4 Significantly enhances neighborhood connections to schools</td>
</tr>
<tr>
<td></td>
<td>2 Moderately enhances neighborhood connections to schools</td>
</tr>
<tr>
<td></td>
<td>0 Does not enhance neighborhood connections to schools</td>
</tr>
<tr>
<td>Filling network gaps</td>
<td>4 Fills a network gap completing a major route</td>
</tr>
<tr>
<td></td>
<td>2 Fills a network gap that partially completes a route</td>
</tr>
<tr>
<td></td>
<td>0 Does not help complete a route</td>
</tr>
<tr>
<td>Exposure to high vehicular traffic speeds and volumes</td>
<td>4 Significantly reduced exposure</td>
</tr>
<tr>
<td></td>
<td>2 Moderately reduced exposure</td>
</tr>
<tr>
<td></td>
<td>0 No significant change in exposure</td>
</tr>
<tr>
<td>EVALUATION CRITERIA</td>
<td>SCORING (POTENTIAL SCORE OF 0, 1, 2, 3, OR 4)</td>
</tr>
<tr>
<td>---------------------------------------------------------</td>
<td>-----------------------------------------------</td>
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<tr>
<td>Serves a wide range of users</td>
<td>4 Facility is inviting for a wide range of ages and abilities</td>
</tr>
<tr>
<td></td>
<td>2 Facility is inviting for a moderate range of ages and abilities</td>
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<tr>
<td></td>
<td>0 Facility is inviting only to the most experienced and confident users</td>
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<tr>
<td>Right-of-way availability and natural resources impacts</td>
<td>4 Adequate right-of-way may be available/ no natural resources impacts are anticipated</td>
</tr>
<tr>
<td></td>
<td>2 Some right-of-way may be needed/ a relatively small amount of natural resource impacts may occur</td>
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<tr>
<td></td>
<td>0 Significant new right-of-way may be needed/ significant impacts to existing development and/or resources may occur</td>
</tr>
<tr>
<td>Community acceptance</td>
<td>4 Strong community support</td>
</tr>
<tr>
<td></td>
<td>2 Moderate community support</td>
</tr>
<tr>
<td></td>
<td>0 No community support</td>
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<tr>
<td>Feasibility (overall cost and impacts)</td>
<td>4 Minimal cost and impacts</td>
</tr>
<tr>
<td></td>
<td>2 Moderate cost and impacts</td>
</tr>
<tr>
<td></td>
<td>0 Significant cost and impacts</td>
</tr>
<tr>
<td>Improves regional connections and tourism opportunities</td>
<td>4 Significantly improves connections to regional/tourist active transportation routes</td>
</tr>
<tr>
<td></td>
<td>2 Moderately improves connections to regional/tourist active transportation routes</td>
</tr>
<tr>
<td></td>
<td>0 Does not improve connections to regional/tourist active transportation routes</td>
</tr>
</tbody>
</table>
## Project List

Based on the prioritization criteria, Table 2 provides the CAT projects ranked from highest to lowest priority. Details on the CAT route ranking criteria can be found in the Appendix. Projects from the 2007 TSP not covered by the CAT routes, Safe Routes to School (SRTS) projects, as well as additional projects, are included in Tables 3 and 4, respectively. It should be noted that the TSP and SRTS projects were not prioritized using the same criteria. All projects can be found in the Active Transportation System Map (Figure 60).

Table 2: CAT Routes Project List

<table>
<thead>
<tr>
<th>Project Number</th>
<th>CAT Route</th>
<th>TO</th>
<th>FROM</th>
<th>Estimated Cost* ($)</th>
<th>Estimated Cost per 1000 Feet</th>
<th>Time Frame (Short, Medium, Long Term)</th>
<th>Priority (High, Medium, Low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>ROUTE 1A. Timber Park to Downtown Route</td>
<td>SW 3rd Ave./ Broadway St.</td>
<td>SW Oak Rd./ Hwy 211-224</td>
<td>$98,000</td>
<td>$49,000</td>
<td>Short-term</td>
<td>High</td>
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<td></td>
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<tr>
<td>1b</td>
<td>ROUTE 1B. Lakeshore Drive Route</td>
<td>SE 4th Ave./ Broadway St.</td>
<td>SW Oak Rd./SW Lakeshore Dr.</td>
<td>$1,015,000</td>
<td>$245,000</td>
<td>Short-term</td>
<td>High</td>
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<tr>
<td>2</td>
<td>ROUTE 2. SE 4th Avenue/SE Regan Hill Road Route</td>
<td>SE 4th Ave./ Broadway St.</td>
<td>SE Regan Hill Rd. East UGB</td>
<td>$3,657,000</td>
<td>$708,000</td>
<td>Long-term</td>
<td>Low</td>
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<tr>
<td>3</td>
<td>ROUTE 3. NE Pierce Street/NE Cemetery Road Route</td>
<td>SE Shafford Ave./SE 4th Ave.</td>
<td>NE Cemetery Rd. North Terminus</td>
<td>$6,875,000</td>
<td>$851,000</td>
<td>Short-term</td>
<td>High</td>
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<tr>
<td>4</td>
<td>ROUTE 4. Milo McIver State Park Route</td>
<td>NW Park Ave./ Hwy 211-224</td>
<td>Lakeshore Trail South Terminus</td>
<td>$9,934,000</td>
<td>$1,225,000</td>
<td>Medium-term</td>
<td>Medium</td>
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Buffered bike lanes will be added on the Hwy 211-224 portion, bike lanes will be added along the SW Wade St. portion, and a shared roadway will be added along the SW 3rd Ave. portion. ADA compliant sidewalks will be added/completed along the entirety of both routes.

Upgrades and widening to the existing Lakeshore Trail, a shared roadway will be added along the Lakeshore Dr./Beech Rd. portion, and sharrows will be striped along the Broadway St. portion. ADA compliant sidewalks will be added/complete along the entire route.

Bike lanes will be added along the Regan Hill portion, half bike lanes (uphill) and half shared roadway (downhill) will be added along the SE 4th Ave. portion east of Shafford Ave., and a shared roadway will be added along the SE 4th Ave. portion west of Shafford Ave. ADA compliant sidewalks will be added/completed along the entire route.

Bike lanes will be added along the NE Cemetery Rd. portion north of Cascadia Ridge Dr., half bike lanes (uphill) and half shared roadway (downhill) will be added along the NE Cemetery Rd. portion south of Cascadia Ridge Dr., separated bike lanes will be added on the NE 6th Ave. portions, and a shared roadway will be added along the NE Pierce St./SE Shafford Ave. portion. A 10’ pedestrian bridge will be constructed on each side of the existing bridge near the intersection of NE Cemetery Rd. and NE 6th Ave. ADA compliant sidewalks will be added/completed along the entire route.

Upgrades, widening, and extension of the existing Lakeshore Trail. A pedestrian bridge will be constructed to connect Estacada to Milo McIver State Park.
<table>
<thead>
<tr>
<th>PROJECT NUMBER</th>
<th>CAT ROUTE</th>
<th>TO</th>
<th>FROM</th>
<th>ESTIMATED COST* ($)</th>
<th>ESTIMATED COST PER 1000 FEET</th>
<th>TIME FRAME (SHORT, MEDIUM, LONG TERM)</th>
<th>PRIORITY (HIGH, MEDIUM, LOW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>ROUTE 5.</td>
<td>NW 6th Ave./NE Pierce St., NE 2nd Ave./NE Shafford Ave., and SE 4th Ave./Broadway St.</td>
<td>SE River Mill Rd./Hwy 211-224</td>
<td>$13,434,000</td>
<td>$1,206,000</td>
<td>Short-term</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>NORTH CITY ROUTE</td>
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<tr>
<td>6</td>
<td>ROUTE 6.</td>
<td>Hwy 211-224</td>
<td>Hwy 211-224 North UGB</td>
<td>$5,488,000</td>
<td>$499,000</td>
<td>Medium-term</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>HIGHWAY 211-224 ROUTE</td>
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<tr>
<td>7A</td>
<td>ROUTE 7A.</td>
<td>SW Wade St./SW 2nd Ave.</td>
<td>NW Wade St./NW 6th Ave.</td>
<td>$897,000</td>
<td>$374,000</td>
<td>Long-term</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>NW WADE STREET</td>
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</tr>
<tr>
<td>7B</td>
<td>ROUTE 7B.</td>
<td>SE Main St./SE 3rd Ave.</td>
<td>NE Main St./NE 6th Ave.</td>
<td>$2,357,000</td>
<td>$953,000</td>
<td>Long-term</td>
<td>Low</td>
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<tr>
<td></td>
<td>NE MAIN STREET ROUTE</td>
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<tr>
<td>8–14</td>
<td>CROSSING ENHANCEMENTS PROJECT NUMBERS 8-14</td>
<td>N/A</td>
<td>N/A</td>
<td>$1,901,000</td>
<td>N/A</td>
<td>Short-term</td>
<td>High</td>
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</tbody>
</table>

*Costs in 2017 dollars

Table 3: Additional Active Transportation Projects

<table>
<thead>
<tr>
<th>PROJECT NUMBER</th>
<th>PROJECT LOCATION</th>
<th>FROM</th>
<th>TO</th>
<th>COST*</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>SE River Mill Road</td>
<td>SE Farmstead Road</td>
<td>Hwy 211-224</td>
<td>$590,000</td>
</tr>
<tr>
<td>16</td>
<td>SE Eagle Creek Road</td>
<td>SE Duus Road</td>
<td>SE River Mill Road</td>
<td>$880,000</td>
</tr>
<tr>
<td>17</td>
<td>N 1st Avenue</td>
<td>N Broadway Street</td>
<td>SE Shafford Road</td>
<td>$366,000</td>
</tr>
<tr>
<td>18</td>
<td>N 2nd Avenue</td>
<td>NW Wade Street</td>
<td>N Broadway Street</td>
<td>$145,000</td>
</tr>
</tbody>
</table>

*Costs in 2017 dollars

Crossing enhancements may include: two pedestrian hybrid beacons, marked crosswalks with warning signage, a median refuge, minimizing curb radii, signal controller enhancements, and lighting. Intersection locations include Hwy 211-224/SW 2nd Ave., Hwy 211-224/SW Wade St., Hwy 211-224/Broadway St., Hwy 211-224/SE River Mill Rd., NW 6th St./NW Wade St., NE 6th St./NE Main St., and NW Wade St./NW 10th Ave. Specific treatments to be determined at the time of project development, subject to further analysis and approval of the facility owner.
### Table 4: Additional Projects (Safe Routes To School\(^{1,2,3}\))

<table>
<thead>
<tr>
<th>PROJECT NUMBER</th>
<th>PROJECT LOCATION</th>
<th>FROM</th>
<th>TO</th>
<th>COST*</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>SE Coupland Road</td>
<td>NE Cemetery Road</td>
<td>East UGB</td>
<td>$1,197,000</td>
</tr>
<tr>
<td>20</td>
<td>SE Eagle Creek Road</td>
<td>SE Duus Road</td>
<td>SE River Mill Road</td>
<td>$1,285,000</td>
</tr>
<tr>
<td>21</td>
<td>SE River Mill Road</td>
<td>SE Farmstead Road</td>
<td>Hwy 211-224</td>
<td>$862,000</td>
</tr>
</tbody>
</table>

#### Bike Lanes on Arterials and Collectors

- **SE Coupland Road**
- **SE Cemetery Road**
- **East UGB**

#### Shared Use Path Extensions\(^{**}\)

<table>
<thead>
<tr>
<th>PROJECT NUMBER</th>
<th>PROJECT LOCATION</th>
<th>FROM</th>
<th>TO</th>
<th>COST*</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>SW Maple Road North Terminus</td>
<td>Hwy 211-224</td>
<td>$27,000</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>SW Ivy Road North Terminus</td>
<td>Hwy 211-224</td>
<td>$31,000</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>SW Grove Road North Terminus</td>
<td>Hwy 211-224</td>
<td>$41,000</td>
<td></td>
</tr>
</tbody>
</table>

#### Supplementary CAT Route – Shared Roadway

<table>
<thead>
<tr>
<th>PROJECT NUMBER</th>
<th>PROJECT LOCATION</th>
<th>FROM</th>
<th>TO</th>
<th>COST*</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>NE 5th Avenue, NE Carole Street, &amp; NE Oakview Drive</td>
<td>NE Pierce Street</td>
<td>NE Oakview Lane</td>
<td>$7,000</td>
</tr>
</tbody>
</table>

---

*Costs in 2017 dollars.

**City is responsible for maintenance.

---

1. Action Plan for Clackamas River Elementary School
2. Action Plan for Estacada Middle School
<table>
<thead>
<tr>
<th>PROJECT NUMBER</th>
<th>RECOMMENDATIONS</th>
<th>LEAD AGENCY</th>
<th>PRIORITY</th>
<th>SCHOOL</th>
<th>COST*</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE 6th Avenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Add a stop sign and flashing beacon at the east leg of NE 6th Ave. and N Broadway St. and a stop sign at the west leg.</td>
<td>City</td>
<td>Medium</td>
<td>River Mill Elementary</td>
<td>$$</td>
</tr>
<tr>
<td>33</td>
<td>Upgrade crosswalk at NE 6th Ave. and NE Pierce St. with continental markings, signs, and ADA curb ramps.</td>
<td>City</td>
<td>Medium</td>
<td>Estacada Middle</td>
<td>$$</td>
</tr>
<tr>
<td>34</td>
<td>Finish sidewalks on the south side of NE 6th Ave. from Wade Creek to NE Cemetery Rd.</td>
<td>City</td>
<td>Medium</td>
<td>Estacada Middle</td>
<td>$$</td>
</tr>
<tr>
<td>35</td>
<td>Replace diagonal crosswalk west of the high school driveway with perpendicular crosswalk and continental markings, signs, and ADA curb ramps.</td>
<td>City</td>
<td>Low</td>
<td>Estacada Middle</td>
<td>$$</td>
</tr>
<tr>
<td>NE 5th Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Install sidewalks on north side of NE 5th Ave. between NE Main St. and north-south alleyway between Main and N Broadway.</td>
<td>City</td>
<td>Medium</td>
<td>Estacada Middle</td>
<td>$$$</td>
</tr>
<tr>
<td>NE Pierce Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Upgrade school zone signage to current ODOT standards</td>
<td>City</td>
<td>High</td>
<td>Estacada Middle</td>
<td>$$</td>
</tr>
<tr>
<td>NE Currin Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Construct infill sidewalk on east side of NE Currin St. between NE 2nd Ave. and E 1st Ave.</td>
<td>Estacada School District</td>
<td>High</td>
<td>Clackamas River Elementary</td>
<td>$$</td>
</tr>
<tr>
<td>39</td>
<td>Construct sidewalk on west side of NE Currin St. between NE 2nd Ave. and E 1st Ave.</td>
<td>City</td>
<td>Low</td>
<td>Clackamas River Elementary</td>
<td>$$$</td>
</tr>
<tr>
<td>NE Cemetery Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Construct a new crosswalk at NE Foothills Dr.</td>
<td>City</td>
<td>Medium</td>
<td>Clackamas River Elementary</td>
<td>$$</td>
</tr>
<tr>
<td>N Broadway Street</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Install a crosswalk and ADA-compliant curb ramps across N Broadway St. connecting to the south corner of NW 10th Ave.</td>
<td>City</td>
<td>High</td>
<td>River Mill Elementary</td>
<td>$$</td>
</tr>
<tr>
<td>42</td>
<td>Add Neighborhood Greenway signs and pavement markings on N Broadway St. from NE 6th Ave. to NW 10th Ave. and into the new subdivision.</td>
<td>City</td>
<td>Medium</td>
<td>River Mill Elementary</td>
<td>$$</td>
</tr>
<tr>
<td>8th Avenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Sign 8th Ave. as a one-way street westbound.</td>
<td>Estacada School District</td>
<td>Medium</td>
<td>River Mill Elementary</td>
<td>$</td>
</tr>
<tr>
<td>PROJECT NUMBER</td>
<td>RECOMMENDATIONS</td>
<td>LEAD AGENCY</td>
<td>PRIORITY</td>
<td>SCHOOL</td>
<td>COST*</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------</td>
<td>-------------</td>
<td>----------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>NW 10th Avenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Construct approx. 118 feet of sidewalks on the south side of NW 10th Ave. to fill the gap east of Eagle Creek Rd.</td>
<td>City</td>
<td>High</td>
<td>River Mill Elementary</td>
<td>$$</td>
</tr>
<tr>
<td>45</td>
<td>Install new stop sign pole at correct height at Eagle Creek Rd.</td>
<td>City</td>
<td>Medium</td>
<td>River Mill Elementary</td>
<td>$</td>
</tr>
<tr>
<td>46</td>
<td>Trim bushes and trees obscuring signs and blocking sidewalk along the north and south sides of NW 10th Ave. between SW Wade St and N Broadway St.</td>
<td>City</td>
<td>Medium</td>
<td>River Mill Elementary</td>
<td>$</td>
</tr>
</tbody>
</table>

*Cost only provided as relative magnitudes. Prioritization and costs developed by SRTS Clackamas County (documents attached in the appendix). SRTS projects covered by CAT Routes were not mapped.
Figure 60. Active Transportation System Map
**FUNDING**

This section provides an update to the transportation funding forecast for the 2007 TSP. The forecast provided below extrapolates out to the year 2040, though it is recognized that the City has taken advantage of new funding sources since then. A summary of potential new funding sources that could be used to supplement the traditionally used sources is also provided.

**EXISTING FUNDING SOURCES**

The City of Estacada currently utilizes several sources to fund construction of its transportation infrastructure as described below. These sources collect revenue that is used to maintain street facilities or construct new roadway improvements, with some restrictions on the type and location of projects. In Estacada, as in many other Oregon cities, street revenues are also used to fund administrative costs such as salaries, benefits, expenses and other services related to street projects. Some sources of revenue are collected annually while others are provided on a project-specific basis.

In 2007, the City of Estacada anticipated collecting approximately $445,000 (2006 dollars) for street construction and repair each year\(^4\). This revenue was assumed to be generated from the state (fuel taxes, license fees and grants), general fund transfers, system development charges, and other revenue sources. Total revenues to be collected over the 23 years between 2018 and 2040 would be $12,610,000 (2017 dollars) with 2007's funding sources and projected population and employment growth.

The following sections describe funding sources that were assumed to be available in the 2007 TSP financial analysis, and how they contribute to overall transportation revenues.

**State Fuel Tax and Vehicle License Fee**

The State of Oregon Highway Trust Fund collects various taxes and fees on fuel, vehicle licenses, and permits. A portion is paid to cities annually on a per capita basis. By statute, the money may be used for any road-related purpose. Estacada has historically used these funds for street operating and maintenance needs.

Oregon gas taxes are collected as a fixed amount per gallon of gasoline served. The gas tax in Oregon was raised in 2009 to 31.12 cents per gallon, though the original calculations used in this report use the pre-2009 rate of 24 cents per gallon. The tax does not vary with gas prices changes, nor is there an adjustment for inflation. The tax's flat rate nature means that the net revenue collected has gradually eroded as the cost to construct and repair the transportation systems has increased. Fuel efficiency in new vehicles has further reduced the revenue stream.

Oregon vehicle registration fees are collected as a fixed amount at the time a vehicle is registered with the Department of Motor Vehicles. Vehicle registration fees in Oregon have increased since the 2007 TSP from $15 per vehicle per year to $86 per vehicle per year for passenger cars, with similar increases for other vehicle types. There is no adjustment for inflation tied to vehicle registration fees.

In 2006, Estacada received about $120,000 in State gas tax and vehicle license fee revenue. Essentially, all of these funds are spent on surface maintenance of local streets and administrative costs. Because there is no index for cost inflation, this revenue level will increase only proportionate with the City's population growth relative to Clackamas County growth. For the Estacada Active Transportation Plan analysis, revenue assumptions are adjusted to reflect the increase in gas tax, with a projection of approximately $3.6 million (2017 dollars) in revenue over 23 years.

\(^4\) The City has historically allocated $35,000-$90,000 a year for capital outlays (including maintenance) from the gas tax revenues. This historical allocation is expected to increase over the next 23 years.
System Development Charge
The System Development Charge (SDC) for streets is used as a funding source for capacity projects for the transportation system. The SDC is collected from new development based on the proposed land use and size, with SDC fees based on each land use's potential vehicle trip generation. The current SDC rate was set in 1999 and updated in 2007, and is updated regularly to reflect current year construction costs. SDCs are based on the number of Equivalent Length New Daily Trips (ELNDT) estimated for each development. The SDC rate as of 2007 was $211.60 per ELNDT. The SDC for a single-family residence was $2,025.

For fiscal year 2006/2007, the income from SDCs within Estacada was $45,300. Average SDC revenues over the previous six years were $45,730, but varied from $10,000 to $183,000 depending on the development that occurred in a given year. The SDC income potential over the 23 years between 2018 and 2040 was estimated based on the forecasted household and employment growth within the City urban growth boundary. Based on 2007's land use forecasts, Estacada is expected to collect approximately $5.9 million (2017 dollars) from SDC fees over that time.

General Fund Transfer
The transfer of monies from the general fund has been used to help finance transportation services in Estacada. An annual average of $67,000 was transferred from the general fund from 2001 to 2007. For the Estacada Active Transportation Plan analysis, this number is assumed to be $81,000 per year (2017 dollars) to reflect inflation. This money is primarily used to cover administrative expenditures such as salaries and overhead.

ODOT Grants
In 2007, Estacada had received at least $25,000 annually from ODOT's Special Cities Allotment Grant for small community funding. These grants came from a statewide $1 million distribution for cities with less than 5,000 population. It was anticipated that this grant money would continue to be a revenue source for city street projects.

Exactions
These are improvements that are obtained as conditions of development approval. Developers are required to improve their street frontage and, in some cases, provide off-site improvements depending upon the level of traffic generation and the impact to the transportation system. This has been a common method of funding sidewalk improvements within the city, but is a difficult funding source to plan for because exactions are highly variable and currently unknown.

Other Revenue Sources
Development plan review fees, voluntary property owner contributions, and investment interest have provided additional revenues for the City street fund. An average of $17,000 in revenue was received from these sources from 2001-2007 and totaled $27,500 in the 2006-2007 fiscal year. An average estimate of approximately $24,000 per year (2017 dollars) is assumed through the year 2040.

Summary
Table 1 summarizes the historically used funding sources as of 2007. Under the above funding programs, using 2017 dollars, the City of Estacada will collect approximately $548,000 for street fund revenues each year. Expenses for maintenance, street lighting, signing and striping, and other are expected to average around $319,000 per year, leaving around $230,000 per year for capital projects. Total gross revenues collected between 2018 and 2040 are anticipated to be $12.6 million with the historically used funding sources, while expenses are projected to be $7.3 million, leaving a total of approximately $5.3 million for capital projects over the years 2018-2040.

If the City spends more than the above revenues collected for transportation purposes, the funding will most likely

5 This revenue estimate should be refined as more specific development data becomes available.
need to be taken from City reserve funds or increases in other revenue sources such as SDCs or street utility fees. Therefore, it is reasonable to expect that additional capital and maintenance responsibilities in the City would require new or expanded revenue sources. If the forecasted future growth does not occur, the amount of SDC revenue would be reduced significantly.

Table 5: Transportation Revenues for Estacada (2006 Dollars)

<table>
<thead>
<tr>
<th>FUNDING CATEGORY</th>
<th>ANNUAL AMOUNT</th>
<th>ESTIMATED REVENUES (2017-2040)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Fuel Apportionment &amp; Vehicle License Fee</td>
<td>$155,000</td>
<td>$3,565,000</td>
</tr>
<tr>
<td>SCA Grant</td>
<td>$25,000</td>
<td>$575,000</td>
</tr>
<tr>
<td>General Fund Transfer</td>
<td>$81,070</td>
<td>$1,864,610</td>
</tr>
<tr>
<td>Other Revenues (Investment Income, Fees, etc.)</td>
<td>$24,200</td>
<td>$556,600</td>
</tr>
<tr>
<td>System Development Charge (Street)</td>
<td>$257,730</td>
<td>$5,927,790</td>
</tr>
<tr>
<td>Total Revenues</td>
<td>$548,250</td>
<td>$12,609,750</td>
</tr>
<tr>
<td>Expense Category</td>
<td>Annual Amount</td>
<td>Estimated Expenses (2018-2040)</td>
</tr>
<tr>
<td>Maintenance</td>
<td>$81,070</td>
<td>$1,864,610</td>
</tr>
<tr>
<td>Street Lighting</td>
<td>$38,720</td>
<td>$890,560</td>
</tr>
<tr>
<td>Signs and Striping</td>
<td>$6,050</td>
<td>$139,150</td>
</tr>
<tr>
<td>Other</td>
<td>$193,600</td>
<td>$4,452,800</td>
</tr>
<tr>
<td>Total Expenses</td>
<td>$319,440</td>
<td>$7,347,120</td>
</tr>
<tr>
<td>Net Revenue for Capital Projects</td>
<td>$228,810</td>
<td>$5,262,630</td>
</tr>
</tbody>
</table>

SPECIAL ACTIVE TRANSPORTATION FACILITY DESIGN STANDARDS

Cross-section standards for walking and biking facilities are included as part of the 2007 TSP Motor Vehicle Plan (Chapter 8). In addition to those, special cross-section standards for shared-use paths and pedestrian facilities in commercial districts are provided below.

**Figure 61. Shared-Use Path**

*Gravel Shoulder*

**Figure 62. Pedestrian Design for Commercial Districts**

*Street Tree*
BIKE PARKING ASSESSMENT

People bicycling expect a safe and convenient place to secure their bicycle when they reach their destination. This may include short-term parking (generally for periods of two hours or less), or longer-term parking for employees, students, residents and commuters.

EXISTING CONDITIONS

In Estacada, there are approximately twelve locations with public bike parking. The existing parking is located near many popular destinations. Approximately half of the existing bike parking supply is clustered in downtown, near shops, restaurants, City Hall, and other places of employment. Newer bike parking facilities also exist at the Library and Wade Creek Park near their respective entrances. Finally, all schools in Estacada have some type of bike parking. The bike racks in downtown and near Wade Creek Park consist of the Inverted-U design (also referred to as “Staple Racks”). This rack style is very common and functional. It supports the bike upright, accommodates a variety of bikes, allows locking of the frame and at least one wheel with a U-lock, provides security, and is intuitive for new users. The bike rack in front of the Library is of the Spiral design, which makes it challenging to lock a bike. Additionally, the need to lift a bike into the Spiral Rack can pose a barrier to access and does not provide sufficient space between the bars for certain types of bicycles.

DESIGN GUIDANCE

Typical Applications

- Bike racks accommodate short-term bicycle parking and are meant to accommodate visitors, customers, and others expected to depart within two hours.
- On-street bike corrals (also known as on-street bicycle parking) consist of bicycle racks grouped together in a common area within the street traditionally used for motor vehicle parking. Corrals are reserved exclusively for bicycle parking and provide a relatively inexpensive solution to providing high-volume bicycle parking. Bicycle corrals can be implemented by converting one or two on-street motor vehicle parking spaces into on-street bicycle parking. Each motor vehicle parking space can be replaced with approximately 6-10 bicycle parking spaces.
- Bicycle lockers are intended to provide longer-term bicycle storage for employees, students, residents, commuters, and others expected to park for more than two hours. Long-term facilities protect the entire bicycle, its components and accessories against theft and inclement weather, including snow and wind-driven rain.

Design Features

Bike Racks

- 2 feet minimum from the curb face to avoid “dooring.”
- 4 feet between racks to provide maneuvering room.
- Locate close to destinations; 50 feet maximum from a building’s main entrance.
- Minimum clear distance of 6 feet should be provided between the bicycle rack and the property line.
**Bike Corrals**
- People biking should have an entrance width from the roadway of 5-6 feet.
- Can be used with parallel or angled parking.
- Parking stalls adjacent to curb extensions are good candidates for bicycle corrals since the concrete extension serves as a delimitation on one side.

**Bike Lockers**
- Minimum dimensions: width (opening) 2.5 feet; height 4 feet; depth 6 feet.
- 4-foot side clearance and 6-foot end clearance.
- 7-foot minimum distance between facing lockers.

**Construction Costs**
Construction costs vary widely depending on the design and materials used. Bike rack costs can range from approximately $60 to $3,600 depending on design and materials used. Bike lockers typically cost between $1,500 and 3,000.

**PROPOSED IMPROVEMENTS**
Estacada’s primary need is to add bike parking to major destinations that do not currently have safe places for people to lock their bikes, even for the short term. Proposed locations for bike parking include:

- Along the Lakeshore Trail
- Timber Park
- Harvest Market Grocery Store
- Cazadero Heights Park
- Future park-and-ride near Library
- Industrial Park

Most of these locations could be served by the addition of several Inverted-U racks. However, the future park-and-ride could be a good location for secure, weather-protected long-term bike parking so commuters could store their bikes for the day. Downtown Estacada could also benefit from the addition of long-term, weather protected bike parking for people to use while at work or running longer errands. For example, bike lockers could be added near the Estacada Station Bicycle Plaza.
LIGHTING GUIDANCE

The purpose of both roadway and street lighting is to provide comfortable and accurate night time visibility of possible hazards in time to allow for appropriate actions to be taken. For people walking and biking, the purpose of lighting is to provide visibility of surroundings and sidewalks. Adequate lighting has the potential to improve public and pedestrian safety, security, and convenience. Furthermore, lighting may act as a crime deterrent and often contributes to community pride. Design light levels based on road classification and pedestrian conflict ranks can be found in the Illuminating Engineering Society’s Roadway Lighting Manual. Further guidance can be found in the ODOT Lighting Policy and Guidelines Manual.

PGE currently maintains lighting equipment within the city of Estacada, so all new lighting equipment should be included in the current Portland General Electric (PGE)-approved street lighting equipment list. If the city of Estacada decides to install fixtures not included in the PGE-approved street lighting equipment list, Estacada staff or a contractor hired by the City must maintain the equipment.

Trails

For trail lighting, reference the Roadway Lighting Manual for respective light levels. Generally, install lower-wattage decorative or pedestrian-scaled fixtures, closely spaced to provide uniform coverage. The poles and luminaires should provide vertical and horizontal clearance (eight feet and two feet respectively).

Crossings

Luminaires are typically placed adjacent to facilities crossing roadways instead of directly above the facility in order to better illuminate people walking and biking. A vertical illuminance level of 20 lux measured five feet from the road surface allows drivers to detect people walking in mid block crossings at adequate stopping distance. Figure 63 shows examples of lighting layouts for mid block and intersection crossings.

Figure 63. Lighting Locations for Mid block and Intersection Crossings

---

1 Roadway Lighting Manual, ANSI/IES RP-8-14
2 Roadway Lighting Manual, ANSI/IES RP-8-00
3 Roadway Lighting Manual, ANSI/IES RP-8-14
Shared Residential Streets

Proposed light levels can be found in the Roadway Lighting Manual. Consideration should be made to balance safe light levels for people walking and biking without creating nuisance light for residents (i.e. using fixtures with full cut-off and house shields in order to limit back light and glare).

In urban areas and areas with lower vehicular speeds (25 mph or less), it is important for drivers to be able to evaluate potential road conflicts with people walking and biking and animals. These hazards are likely to be seen in the driver’s peripheral view and their visibility will be affected by the uniformity of light on the roadway. In Figure 64, photographs taken at a test site for the Seattle City Light light-emitting diode (LED) Streetlight Application and Assessment Project\(^4\) provide a qualitative visual comparison between LED and High Pressure Sodium (HPS) street lighting. These photographs were taken from the perspective of a driver or pedestrian crossing the roadway. The LED luminaires provide better color rendering than the HPS luminaires.\(^5\) Furthermore, LED lighting uses 50 percent less energy and provides better illumination. For this reason, LED street lights are proposed for all new installations.

**Figure 64. Visual Comparison between HPS and LED lighting**

\(^4\) Seattle City Light LED Streetlight Application and Assessment Project Final Report, December 2009.

BENCH PLACEMENT GUIDANCE

Location
- Public benches should be located where people are most likely to walk, and near attractions such as businesses, schools, trailheads, and transit stops. Additionally, benches should be placed near locations where people with mobility challenges live and travel, such as hospitals and assisted living facilities.
- Rest areas with benches should be located roughly every ¼ mile along a trail.

Design
- Create space next to a bench for a person in a wheelchair to pull up, turn around, and sit next to a friend.
- Leave a couple feet of concrete on the platform to the sides and behind the bench so that the person sitting has space to move around, lean back, and put things down.
- Locate trash cans close enough to the bench to be convenient, but not close enough to smell on a hot summer day.
- In the Pacific Northwest, site benches under a deciduous tree to provide shade in the summer and sun in the winter.
- Use a backless bench in between activity centers, such as a park and a trailhead so that people could sit in either direction. For viewpoints, backless benches are also a good choice because they do not obstruct the view when not in use.
- Add lighting in areas with benches, where possible, to address safety concerns.