Oregon Department of Transportation · Washington County

TUALATIN VALLEY TRAIL



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The contents of this document do not necessarily reflect views or policies of the State of Oregon.

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1 /// INTRODUCTION

"What if I could bike from home to school without ever getting into traffic?"

Questions this chapter answers:

- * What is the Tualatin Valley Trail?
- * What local needs does it serve?
- * What is its regional significance?



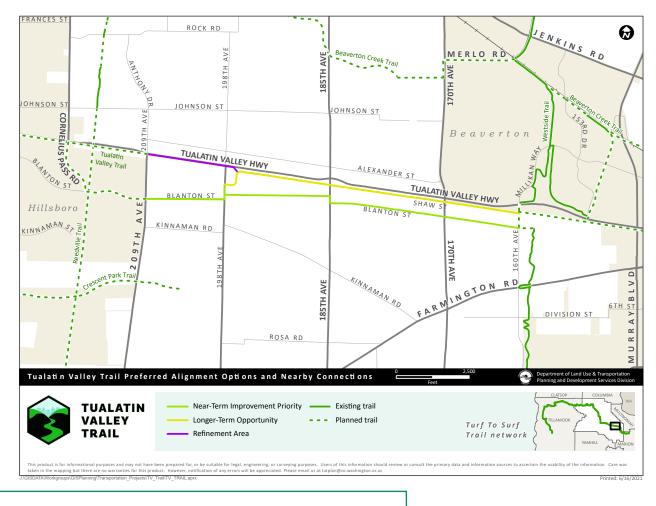
The idea of a Tualatin Valley (TV) Trail has been a topic of community discussions for decades. Envisioned as an important link between Beaverton, Aloha, and Hillsboro, the trail would also be a key part of a network of low-stress, safe trails connecting the greater Portland region with the Oregon Coast.

The TV Highway corridor has been the subject of substantial local planning work to identify locations for access and safety improvements as well as the potential for future high-capacity transit service.

This Concept Plan shares the results of a study to select a preferred trail alignment that will meet the connectivity, safety, access, and mobility needs for people walking, biking, and rolling through Washington County. It's time to make the TV Trail a reality!

2 /// CONCEPT PLAN OVERVIEW

The TV Trail Concept Plan describes the planning process and selection of the two preferred near- and long-term opportunities to serve local and regional trail connectivity between SW 160th Avenue and Cornelius Pass Road.





"What is a concept plan?"



A concept plan identifies a vision for the facility such as its future form and function and informs future decision-making about how to turn vision into reality.

The Preferred Trail Alignment Alternatives

The TV Trail Concept Plan explored five alignment alternatives for the TV Trail, including Johnson Street, Alexander Street, TV Highway, Shaw Street, and Blanton Street. Through the planning process, these were narrowed down to two: SW Shaw Street and SW Blanton Street.

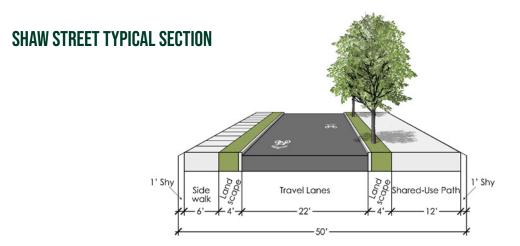
Typical roadway sections (shown below) and intersection treatments were developed for both alternatives based on:

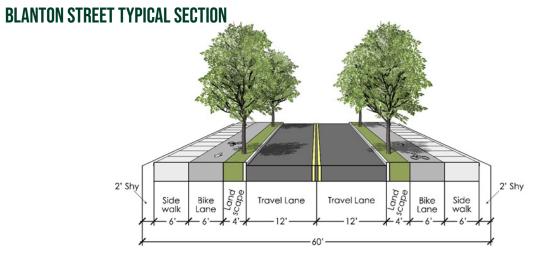
- Traffic analysis
- National and local guidance for developing low-stress facilities for people walking, biking, and rolling
- Consideration of safety and comfort
- Impacts to traffic on the adjacent roadway networks
- Impacts to property owners due to the need to potentially acquire additional right-of-way for the trail

 Priority connections to amenities including transit, businesses, schools, parks, other trails, and nearby neighborhoods.

The analysis found challenges on both corridors, including technical challenges with intersection crossings on SW Shaw Street and right-of-way constraints as well as numerous driveways on SW Blanton Street.

The concept design for both corridors is intended to provide a safer more comfortable user experience. The concept designs for SW Blanton Street and SW Shaw Street are detailed later in this plan. Both corridors require further exploration to determine if they could be improved to meet the region's expectations of a regional trail facility.







TYPES OF CYCLISTS BY COMFORT LEVEL



3 // KEEPING THE END USER IN MIND

The TV Trail Concept Plan presents safe, comfortable, and low-stress options for traveling the TV Highway corridor, increasing access to physical activity and essential destinations.



Implementing the TV Trail Concept Plan will result in:

- People in underserved communities having a place that feels safe to set out on foot or on wheels—whether for fun and fitness or for getting to work, running errands, or catching a bus or MAX train.
- People traveling through having the opportunity to stop at local businesses.
- People driving on TV Highway enjoying less traffic, as some people feel encouraged to use the trail instead of drive.

Finding the Right Route

The TV Trail Concept Plan explored five alignment alternatives for the trail, including Johnson Street, Alexander Street, TV Highway, Shaw Street, and Blanton Street.

The railroad between TV Highway and Shaw Street, owned by Union Pacific, has been envisioned in previous planning efforts as a potential rail with trail. Having a trail parallel to the railroad presents significant challenges; the most relevant being proximity and coordination with railroad infrastructure. Options to have a trail parallel to the railroad were considered as part of the TV Highway and Shaw Street alternatives.



through Aloha.

PRIORITIZING LOCAL NEEDS

The Aloha-Reedville community is very diverse and have long expressed a desire to walk, roll and bike in a low-stress way to access community destinations.

THE ALOHA-REEDVILLE COMMUNITY







45%
OF HOUSEHOLDS
ARE BELOW
200%
OF THE POVERTY LINE



ABOVE AVERAGE CONCENTRATIONS
OF LOW INCOME PEOPLE, PEOPLE OF
COLOR, PEOPLE WITH LIMITED ENGLISH
PROFICIENCY AND YOUNG PEOPLE.



OF RESIDENTS ARE **HISPANIC/LATINO**, THE LARGEST PEOPLE OF COLOR GROUP IN THE AREA, FOLLOWED BY RESIDENTS OF KOREAN, SOMALI, VIETNAMESE, AND AFRICAN AMERICAN DESCENT.

Designing for a Low Stress Experience

A regional trail experience must be safe, comfortable, and low stress for all users. For people biking, the TV Trail Concept Plan aims to design for the "Interested but Concerned" population by providing physically separated bike lanes (SW Blanton Street) or a physically separated shared-use path (SW Shaw Street).

For people walking and rolling, the TV Trail Concept Plan aims to design for all ages and abilities with physically separated sidewalks with landscape buffers (SW Blanton Street), a physically separated shared-use path (SW Shaw Street), context-sensitive pedestrian scale lighting, and improvements to existing pedestrian ramps to comply with the Americans with Disabilities Act (ADA).

PROTECTED CROSSINGS

The TV Trail Concept Plan developed concepts for full protection at challenging roadway crossings including SW 198th Avenue, SW 185th Avenue, SW 170th Avenue, and SW 160th Avenue. SW 198th Avenue/Shaw Street and SW 170th Avenue/Blanton Street already have traffic signals that provide protected crossings. At all other locations the TV Trail Concept Plan recommends installing half signals.







A half signal is a traffic signal that is activated when a trail user pushes the button. The signal stays green for vehicles until activated by a person walking, biking, or rolling. It then turns red to allow the button pusher to cross.



Half signal at 160th and SW Blanton Street (visualization)

4 // WHO PARTICIPATED IN THE PLANNING PROCESS?

Gathering community input was central to the development of the plan. Members of the public were invited to share their ideas for the trail, including route, design, and implementation.

SAC provided input on trail opportunities, trail alignment and outreach opportunities. They reviewed project deliverables and provided feedback throughout the process.

Reaching Out to the Public During the COVID-19 Crisis

The COVID-19 pandemic rapidly changed the way many community members in Washington County work, live, and interact with each other. Washington County, ODOT, and the consultant team offered several engagement opportunities (virtual and in-person) to enable community members to participate safely, yet meaningfully.

Stakeholder Advisory Committee (SAC)

Members of the public also served on the Stakeholder Advisory Committee (SAC). This committee was made up of community members representing a variety of interests related to the trail such as neighborhood, business, tourism, and trail advocates. The

Technical Advisory Committee (TAC)

The Technical Advisory Committee (TAC) was composed of staff from County, agency and jurisdictional representatives, service providers, and topical experts relevant to the project. The TAC provided expert technical review of project deliverables, inter-jurisdictional coordination, and support for community and stakeholder engagement.

The SAC and TAC met four times throughout the project, including at the key milestones shown below.

SAC AND TAC KEY MILESTONES









- Establish goals for the trail
- Identify most promising corridors
- Identify ideal cross section for each of the top 3 corridors
- Identify most preferred corridor(s)
- Input on concept designs for Shaw and Blanton
- Input on draft Concept Plan document

Virtual Study Area Video

A virtual tour of the study area was filmed and shared with the TAC and SAC, and shared with the public through a link at the online open house. The virtual tour included video recordings from the perspective of a bicyclist traveling down all five of the initial alternative corridors demonstrating the user experience for each corridor and at the major crossings.





Virtual Open Houses

Two online open houses were held to solicit feedback from the community. The first, which ran from November 13 through December 11, 2020 gathered feedback on the three most promising alignment alternatives for the TV Trail (SW Johnson Street, SW Shaw Street), and SW Blanton Street). The second, from May 21 through June 7, 2021, narrowed the alternatives to the two most promising (SW Shaw Street and SW Blanton Street. The first open house included a destinations map where people could identify places they would travel to using the TV Trail, if it existed and what should be considered to make the trail accessible and comfortable.. The second open house provided an overview of the concepts for the two most promising alignments and described the tradeoffs between the two options. At each open house, participants were asked which of the trail corridors presented they felt would be the best fit for the TV Trail.

The open houses were advertised through social media, website updates, a media release, the County's regular emailed newsletter, and a postcard mailed to approximately 12,000 households in the study area. Two language options were available for the online open houses: English and Spanish.

Overall, survey participants ranked SW Blanton and SW Shaw as the best fits for a TV Trail and SW Johnson as the worst fit.

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How many people attended the virtual open houses?

alignment included driveways and traffic, but participants liked its connectivity to parks, schools, and residential areas, and the more pleasant environment. Overall, the consensus was that SW Blanton Street would best serve the needs of the community south of TV Highway. **Small Group Stakeholder** Meetings

Johnson Street.

The study team met with stakeholders throughout the course of the project to obtain additional input on the alignments and the design concepts. Participating stakeholders included the Hillsboro and Beaverton School Districts. Tualatin Hills Park and Recreation District, and area employers.

Spanish Language Forum

November 2020 to obtain input on the top

three corridors (SW Johnson Street, SW Shaw

Street, and SW Blanton Street). Similar to the

online open house, participants favored SW

Safe crossings were a top concern for both alignments. Concerns about the Shaw Street

participants like its connectivity to TV Highway

destinations and its potential to improve the

area. Concerns about the Blanton Street

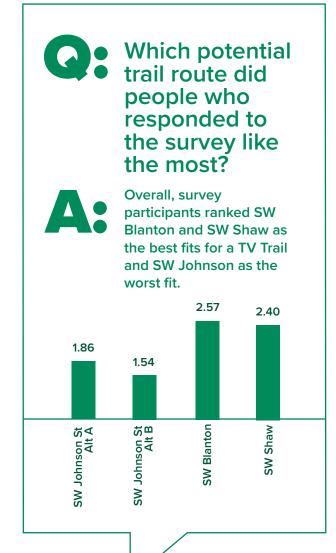
alignment included noise/air quality but

Shaw Street and SW Blanton Street above SW

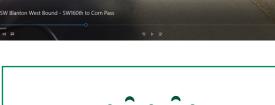
A Spanish language forum was held in

In-Person Outreach

On Thursday, May 20, members of the project team conducted in-person tabling events to engage community members and solicit feedback on the recommended improvements associated with the Blanton and Shaw Street train concepts. The tabling events were located at the Westside Trailhead east of SW 160th Avenue on Blanton Street and at Barsotti Park on Blanton Street east of SW 170th Avenue. Over 20 community members provided direct feedback on the trail recommendations and participated in the in-person survey.









participated in the first open house.

participated in the second.

WE HEARD YOU!

We received comments from **510 community members** through interactive maps, emailed comments, a community survey and virtual open house. Here's what people had to say:



I LOVE THAT THIS WILL GIVE MY
CHILDREN THE ACCESSIBILITY TO
WALK OR RIDE THEIR BIKES
TO SCHOOL SAFELY.



BLANTON IS A COMMUNITY. SHAW
IS A BUSINESS STREET. IT MAY BE
MORE EXPENSIVE FOR BLANTON,
BUT IF THIS IS ABOUT COMMUNITY
SAFETY, AND IMPROVING THE
COMMUNITY, THE CHOICE OF
BLANTON IS CLEAR.

Great idea!
Please build soon!

Definitely do not like the Blanton proposal. **Would change the character and access for homeowners**, too many trees would have to go...Already a lot of confusion for the neighborhood with many parents driving to pick up and drop off and gridlock mornings and afternoons on the street, heavy traffic daily and for the neighbors and pedestrians.

I LIKE HOW CLOSE THE SHAW STREET ROUTE IS TO TV HIGHWAY SO WALKERS/BIKERS CAN VEER OFF TRAIL TO TV TO ACCESS BUSINESSES. 185TH & BLANTON WEST TO BLANTON EAST IS **ALREADY VERY DICEY** FOR PEDESTRIANS AND CYCLISTS. I HAVE WALKED THIS AREA MANY TIMES WITH A DOG. THERE IS A LOT OF TRAFFIC AND I HAVE ALWAYS CONSIDERED THIS AREA TO BE UNSAFE WHEN NOT IN A VEHICLE.

66

Drivers are AGGRESSIVE near the railroad crossings. I have a terrifying experience every time I ride in the zone around TV Hwy.

Great route for Intel workers to use alternative transportation to work in addition to providing options for exercise during off times or breaks.

Blanton
would be
perfect.
More
access
to new
communities.

CONSIDER HAVING A SOFT SURFACE SECTION WITH DIRT OR GRAVEL FOR RUNNERS AND WALKERS IN ADDITION TO A PAVED SECTION FOR BIKES

I LOVE THE EFFORTS TO IMPROVE
ALOHA AND PROVIDE SAFE
ALTERNATIVE TRAILS.

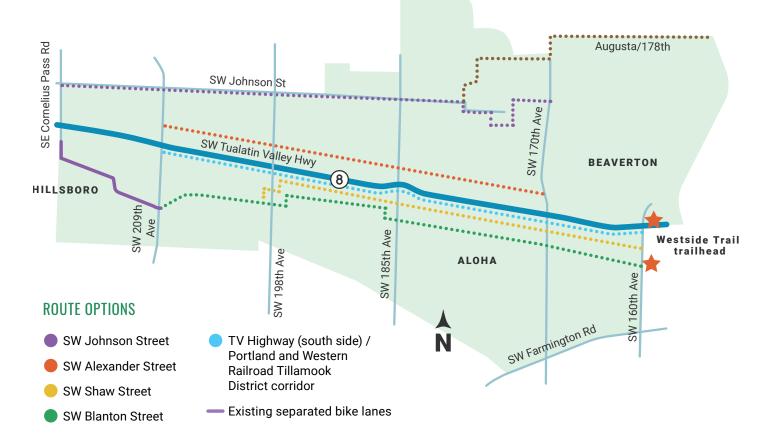
Anything would be an improvement for Blanton but this not only adds pedestrian/ bike area but also much needed parking that isn't just on someone's grass.

It was pretty, but it ends a bit far from a Max stop.

A good way to ride **out of the city** safely!



THE FIVE INITIAL ALIGNMENTS



Questions this chapter answers:

- * How were the two preferred alternatives chosen?
- * How were the various options evaluated?

Selecting the Regional Trail Alignment

There are multiple routes a trail could take through Aloha. The TV Trail needs to integrate into the existing and planned regional trail system to provide connectivity between cities while also improving local access to daily needs, services, and transit for the Aloha community.

A tiered evaluation framework was developed to narrow down the alignment alternatives. This helped clarify which possible routes, or alignments, were most likely to meet these varied needs.

Tier 1: Initial Screening

The initial screening narrowed the field from five potential trail alignments to three.

At its highest level, the TV Trail needs to be safe, efficient, and well integrated into the regional trail system, both as it exists today and as it is planned for the future. The qualitative screening criteria for the Tier 1: Initial Screening included:

- Integration into the existing and planned Regional Trail Network
- Potential for Low Stress user experience

Based on the Tier 1: Initial Screening criteria and input provided by the TAC and SAC, three TV Trail alignment alternatives were advanced into the concept refinement phase.

- SW Johnson Street
- SW Shaw Street
- SW Blanton Street

SW Alexander Street was eliminated from consideration at this point because of its lack of east-west connectivity throughout the corridor and beyond to regional connections. The TV Highway alignment (south side parallel to the railroad) was eliminated because it allowed insufficient space for a trail or for an adequate buffer from TV Highway. It also raised noise and air quality concerns.

Tier 2: Refined Concept Screening

The refined concept screening relied on the goals, objectives, and evaluation criteria established early in the project.

- **Goals:** Provide vision and aspiration for project outcomes.
- Objectives: Refined descriptions and framework on how goals can be accomplished.
- Evaluation Criteria: Measurable achievements; both qualitative and quantitative, to gauge progress towards the project success.

Why was the SW Alexander Street option eliminated?



SW Alexander lacks eastwest connectivity to regional connections and is planned to have high quality walking and biking facilities as part of the town center regardless of the TV Trail alignment. The goals and evaluation criteria, summarized in the table below were used to screen the three alignment alternatives after the Tier 1: Initial Screening. The qualitative results of the Tier 2: Refined Concept Screening are shown in the evaluation matrix.

Goal	Evaluation Criteria
Safety	 Does the trail alternative reduce the potential frequency and severity of crashes involving potential trail user compared to existing facilities? (yes/no, to what extent?).
	 Does the trail alternative maximize separation between vehicles and trail users at crossings where potential users will access the trail or minimize the number of needed crossings? (yes/no, to what extent?).
Connectivity	 Does the trail alternative provide new connections to enhance access to daily needs and services for people walking, biking, and taking public transit? (yes/no, to what extent?).
	 Does the trail alternative increase the number of destinations accessible by walking, biking, or public transit for residents? (yes/no, to what extent?).
Health/Livability	 Is the trail alternative located to maximize recreation access for people within a ¼ mile of the trail? (yes/no, to what extent?).
	 Is the trail alternative located to minimize exposure to air toxins and particulate matter?
Coordination	 Has the trail alternative considered previous planning efforts within the TV Highway corridor? (yes/no, to what extent?).
	 Neighboring jurisdictions and area partners providing comments on the plan during development (yes/no, to what extent?).
	 Does the trail alternative identify cost, timeline, and potential funding strategies (yes/no, to what extent?).
Feasibility	 Is the alignment alternative feasible from a funding, environmental, right-of-way, and permitting perspective? (yes/no, to what extent?).
	 Concept has concurrence from the railroad (yes/no).
Equity	Does the alignment alternative provide for a comfortable facility that can meet the needs of all users and abilities by providing the lowest stress facility possible? (yes/no, to what extent?).
	 Does the alignment service higher portions of transportation disadvantaged population than the average for the area?

EVALUATION MATRIX

Safety		Connectivity		Health/Livability		Coordination		Equity	
Alignment	Crossings	Destinations	Transit	Parks/ Schools	Adjacent Traffic	Planning Cost	Agency Coordination	Title VI	Disadvantaged
SW Blanton Street	Poor	- Fair	Good	_ Fair	Poor	Poor	Good	Good	Good
SW Shaw Street	_ Fair	Good	Good	Good	Good	_ Fair	Poor	Good	Good

Tier 3: Refine Through Concept Design

Based on the trail alignment evaluation, TAC, SAC, and focus group discussions, and input received as part of online open house #1, two alignments were selected to be advanced into the concept design phase.

- SW Blanton Street
- SW Shaw Street

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SW Blanton Street was chosen for its strong connectivity to community destinations and existing trail facilities in the area.

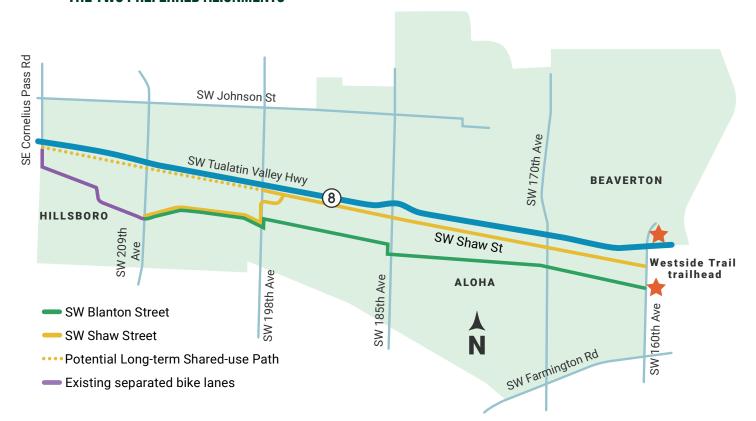
SW Shaw Street was selected for its proximity to TV Highway and transit, and the relative lack of driveways that could become conflict points for arriving and departing motorists and trail users.

SW Blanton Street and SW Shaw Street were both preferred over SW Johnson Street in part because of the greater need for walking and biking facilities south of TV Highway. Planned improvements for the north side of TV Highway include a shared use path. Improvements planned for SW Alexander Street include high quality walking and biking facilities as part of redevelopment of the area as a town center.

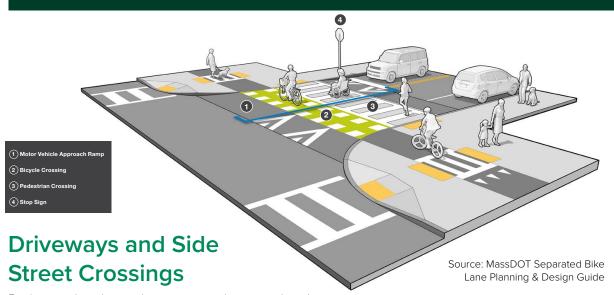
Through the concept design process, each alignment was further evaluated for feasibility including cost, right-of-way, potential concurrence from the railroad, and review of design guidelines and best practices.

The map below shows the two preferred alignments.

THE TWO PREFERRED ALIGNMENTS



6 /// DESIGN CONSIDERATIONS FOR BOTH CORRIDORS



Both corridors have driveways and unsignalized minor streets throughout the corridor. East-west crosswalks are recommended to be striped at these intersections, and treatments for people walking should be considered at major driveways and intersections, such as raised side-street crossings.

Stormwater

Approximately 4-foot planter strips are included on each side of the road, providing an opportunity for stormwater management within the corridor. If a narrower cross-section is used in some sections of the corridor, additional stormwater management facilities may be needed in the corridor.

Trees are recommended in the planter strip to provide shade and vertical separation from vehicles for people walking, biking, and rolling.

Lighting

The roadway and regional trail should be adequately lit to enhance safety and security at night. Pedestrian scale lighting should be provided due to the frequency of driveways.

Utilities

Overhead Portland General Electric (PGE) utility poles are present along SW Shaw Street and SW Blanton Street on at least one side of the road. On Blanton Street, if the utilities stay aerial, PGE will require a 10 foot minimum for aerial transmission construction. With a 2' easement at the back of sidewalk for the Blanton Street cross-section, PGE would need an additional 5 feet of ROW or Property Utility Easement (PUE).

If undergrounding the utilities, PGE conduits would need to be encased in concrete measuring 4' by 4'minimum, with concrete extending within 12" of the final grade. However, PGE has no set standards for this work, so site-specific engineering would need to be conducted to determine feasibility.

Due to the complications and ROW needs associated with the utility poles, the Blanton Street cross-section is more challenging as compared to the SW Shaw Street cross-section. However, between 198th Avenue and 209th Avenue, SW Blanton Street is the only option given PGE's overhead transmission lines.





What is a complete street?

A:

Complete Streets are streets designed and operated to enable safe use and support mobility for all users. Those include people of all ages and abilities, regardless of whether they are travelling as drivers, pedestrians, bicyclists, or public transportation riders.

—Source: U.S. Department of Transportation

Questions this chapter answers:

- ★ What would this option look like?
- ★ How will it impact parking?
- ★ How will people on foot, bikes, and mobility devices cross busy streets?

7 /// THE BLANTON STREET CONCEPT



Overview

The concept trail design for the Blanton Street alignment is a low-stress complete street that includes bicycle lanes in each direction separated from motorized traffic by a landscaped buffer. This trail alignment connects to separated bike lanes in South Hillsboro at a traffic signal that already exists at SW 209th Avenue.

All major roadway crossings would be protected by existing signals or new half signals just for people crossing the street. Connections to the Westside Trail would be made at SW 160th Avenue using a path along the east side of SW 160th Avenue.

What would it look like?

Washington County's Transportation System Plan (TSP) designates SW Blanton Street a Collector Street west of SW 170th Avenue and a neighborhood route east of 170th. Collector Streets provide both access and circulation between residential, commercial, and industrial areas and provide access to Arterial Streets and require up to 74 feet of right-of-way.

Today, SW Blanton Street has 55 feet of right-ofway along much of its length, with some slightlywider areas where dedications have been made through development. Understanding that different right-of-way opportunities and constraints will exist over 2.5 miles, different concept designs were developed.

TYPICAL TRAIL SECTION

The typical section for a regional trail on SW Blanton Street would include separated bike lanes on each side of the street. The bike lanes would be buffered from the street with landscape strips and there would be sidewalks on both sides of the street outside the bike lanes. With two travel lanes and no on-street parking, this section is projected to be about 60 feet wide; however, exact dimensions will be finalized during the design phase.



There are several design approaches that could be applied to provide on-street parking in some areas or to reduce the necessary right-of-way. On-street parking could be provided in some areas within the proposed 60-foot typical section by removing the landscape strip and protecting one of the bike lanes behind the on-street parking (as shown in the narrower sections on page 27).

LAND ACQUISITION

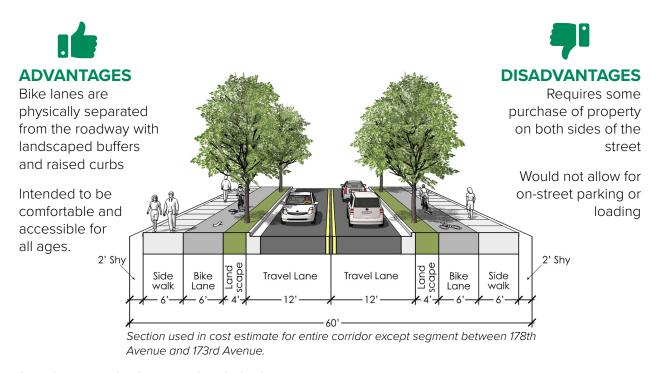
The 60-foot cross-section would maintain the approximate centerline of the current roadway cross section and would encroach on about 160 tax lots on either side of the road throughout the corridor. However, these properties would be minimally impacted, and most driveways would remain usable.

Wider cross-sections utilizing all or some of the 74-foot TSP ROW would significantly impact

about 80 tax lots, with these properties losing a functioning driveway (a driveway of less than 25' deep) or have their building impacted. Therefore, wider cross-sections incorporating parking would add significant cost and impact to properties along the corridor.

The Blanton cross-section with on-street parking (full 74' cross-section) would require approximately an additional 150,000 square feet of right-of-way which would cost approximately an additional \$2.25 million, not including properties that may require full purchasing. The 74' cross-section if applied throughout the corridor could result in the need to purchase approximately 30 properties due to the reduced setback and resulting lack of off-street parking. The additional construction cost of the additional 14' of pavement is estimated to cost an additional \$3-5 million.

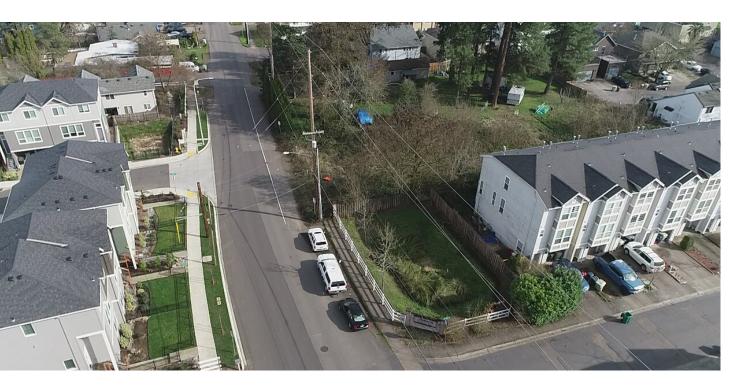
THE BLANTON STREET REGIONAL TRAIL CONCEPT TYPICAL CROSS SECTION



3D VISUALIZATION OF A TYPICAL SECTION



Visualization intended for illustrative purposes only.







How much parking is needed in the area?



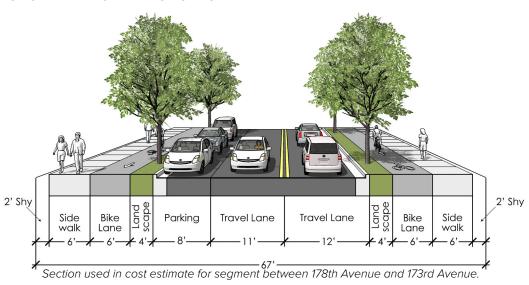
Currently, few people park on Blanton Street west of SW 185th Avenue. East of SW 185th Avenue, greater amounts of multi-family housing and improved sections of roadway result in more on-street parking. As the corridor develops with more multi-family housing, demand for parking could increase.

Blanton Street is classified as a collector west of SW 170th Avenue. The standard for Collector Streets does not include on-street parking. Adding parking would increase the amount of right-of-way that will need to be purchased from property owners along the corridor.

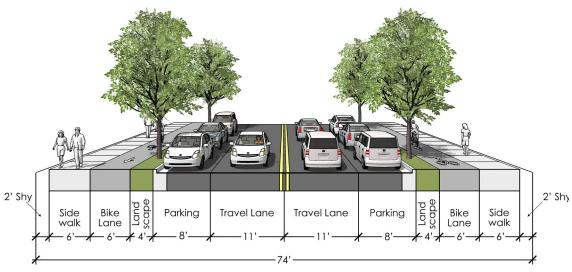
WIDER SECTION

On wider segments of the roadway, on-street parking can be included. The first figure below shows how parking can be incorporated on one side of the road with 67 feet of available width. The second figure shows a 74-foot-wide section with parking on both sides.

WIDER SECTION: PARKING ADDED ON ONE SIDE



WIDER SECTION: PARKING ADDED ON BOTH SIDES





ADVANTAGES

- Intended to be accessible and comfortable for all ages and abilities
- Increases separation from traffic for people walking, biking, and rolling
- Provides on-street parking or loading in targeted locations



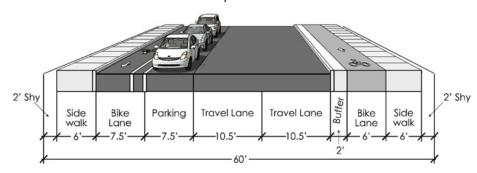
DISADVANTAGES

- Requires additional purchase of property
- Underutilized parking may lead to higher speeds along corridor

NARROWER SECTION ALTERNATIVES

Two potential layouts that fit within a constrained right-of-way are shown in the figures below.

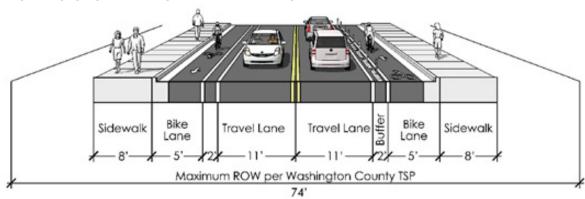
NARROWER SECTION: PARKING ON ONE SIDE, NARROW LANES



This alternative layout fits within a 60 feet of right-of-way and provides a parking protected bike lane, separated bike lane, and sidewalks on both sides of the roadway. The additional value provided by this layout is accommodating on-street parking on one side of the road.

This narrower section is not included in the preferred layout for Blanton Street

NARROWER SECTION: WITH BUFFERED BIKE LANES



This alternative layout that fits within 54 feet of right-of-way and provides buffered bike lanes and sidewalks on both sides of the roadway. This section may not be comfortable for all ages and abilities due to the lack of fully separated facilities for people biking. The additional value provided by this layout is a narrow cross section, reducing the potential impacts to adjacent properties. This narrower section is not included in the preferred layout for Blanton Street



ADVANTAGES

- Reduces conflicts between bicyclists and cars using driveways by increasing separation.
- · Requires the least purchase of property
- Provides the widest sidewalks



DISADVANTAGES

- May not be comfortable for all ages and abilities to bicycle
- Does not provide planting strip between people walking and the street
- Would not allow for on-street parking or loading
- Underutilized parking on the parking on on side option may lead to higher speeds along corridor

Traffic Considerations

Traffic operations were evaluated at the major intersections along the corridor to understand existing and future traffic conditions and how those may impact the corridor needs and the crossing treatment recommendations.

Previous plans for realignments of the off-set intersections at SW 198th Avenue and SW 185th Avenue were reviewed along with their potential need for traffic signals. No realignments or traffic signals are part of the concept due to property impacts, cost, and potential to increase traffic volumes on the corridor. Both the TAC and SAC recommended against improvements that would encourage additional traffic on SW Blanton Street if it were to be designated as the alignment for the TV Trail. The proposed concept would not prohibit these improvements from being pursued in the future.

The need for left-turn lanes at the proposed half signals was evaluated. None of the locations currently have a left-turn lane. While these intersections are currently over capacity during the peak hours, alternative egress points exist allowing for right-turns to exit the area. Adding left-turn lanes is not recommended because they would not alleviate the congestion issue, would provide limited benefit to cars, would reduce the space available to keep the bike lane and sidewalk separated at the intersections, and would be contrary to the TAC and SAC's recommendation to maintain SW Blanton Street as a low-volume street for the regional trail alignment.

At locations where the left-turns onto the major street from SW Blanton Street are over capacity and becoming a safety hazard, left-turn restrictions should be considered.

The analysis of operations, queueing, and signal warrants is included in the appendix, in the Traffic Analysis Memorandum.

Protected Crossings

Protected crossings were evaluated and found to be warranted at each of the five major intersections along the SW Blanton Street alignment that were evaluated to determine the recommended crossing treatments based on national and local guidance. As shown in the concept overview map, half signals are proposed at each of the intersections that is currently unsignalized.

The intersections of SW Blanton Street with SW 198th Avenue and SW 185th Avenue are currently off-set intersections, requiring additional design considerations to provide a safe crossing for people walking, biking, and rolling.

Key Consideration: Numerous Driveways

Driveways that cross bicycle lanes can pose a safety hazard. A cycle track with bicycles traveling in both directions can be confusing for drivers seeking to exit driveways, as they typically expect traffic of any kind to be coming only from their left.

Having bicycle lanes on both sides of the road traveling in the direction of traffic will make it easier for drivers to perceive oncoming cyclists.



SW BLANTON STREET/SW 198TH AVENUE

The results of a traffic analysis indicated a half signal is needed on the north leg of SW Blanton Street with a multi-use path on the west side of SW 198th Avenue connecting the offset approaches of SW Blanton Street Wayfinding signage will direct trail users to cross at the half signal and use the multi-use path to traverse between the legs of the intersection.



SW BLANTON STREET/SW 185TH AVENUE

The concept design places a half signal on the south leg of SW Blanton Street with a multi-use path on the west side of SW 185th Avenue connecting the offset approaches of SW Blanton Street. Wayfinding signage will direct trail users to cross at the half signal and use the multi-use path to traverse between the legs of the intersection.







Additional information on the crossing analysis is included in the appendix, in the Traffic Analysis Memorandum.



SW BLANTON STREET/SW 160TH AVENUE

Traffic analysis indicated the need for a half signal trail users can use to travel east on SW Blanton Street to the southern Westside Trail connection on SW Blanton Street east of SW 160th Avenue, or travel north along a shared use path on the east side of SW 160th Avenue to the northern Westside Trail access at the intersection of TV Highway.



Construction Considerations UTILITIES

Utilities are located on one or both sides of the entire corridor from SW 209th Avenue to SW 160th Avenue.

A 2-foot shy distance for utilities is provided behind the sidewalks in the conceptual cross-sections for SW Blanton Street. Additional space may be required as an easement around each pole. Coordination will be required with PGE to relocate the poles. In addition,

further consideration should be made on undergrounding the utilities. Saving 4' of total shy distance could reduce the number of properties that would require right-of-way negotiations.

COST ESTIMATE

A cost estimate was prepared for the SW Blanton Street corridor as the TV Trail corridor based on the proposed typical section of approximately 60' throughout the corridor, except for the segment between 178th Avenue and 173rd Avenue, which is based on the wider 67' cross-section with parking on one side. The cost estimate assumes above ground utilities

and constructing half signals at the unsignalized major intersections.

The cost estimate includes enhanced driveways and local street crossing treatments, stormwater management, lighting, three new half signals, modifications to two existing traffic signals, and right-of-way. Costs of stormwater management includes permanent landscaping and right-of-way. The right-of-way estimate assumes that a few feet of right-of-way is needed from approximately 180 properties but that the design will avoid impacts to buildings. The cost estimate also includes engineering and contingencies.

\$25,500,000
\$8,000,000
\$2,900,000
\$37,500,000
(\$15,300,000 per mile)

The detailed cost estimate is included in the appendix, in the Concept Design Memorandum.

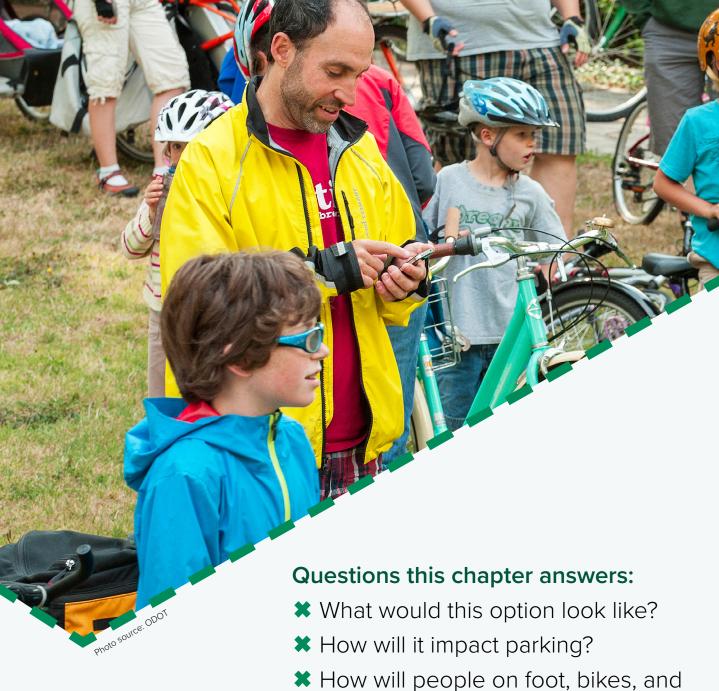
- The full 74-foot cross-section would require approximately an additional 150,000 square feet of right-of-way, which would cost approximately an additional \$2.25 million not including properties that may require full purchasing. The 74' cross-section, if applied throughout the corridor, could result in the need to purchase approximately 30 properties due to the reduced setback and resulting lack of off-street parking.
- The additional construction cost of the additional 14-feet of pavement and base is estimated to cost an additional \$3-5 million.
- The estimated total additional cost compared to the 60' cross-section is \$5-7 million, not including potential full purchase of 30 homes.
- A 55-foot cross-section would essentially eliminate the ROW costs of approximately \$3 million. In addition, there could be potential construction cost savings.

Key Consideration: Cross Section Width

A 60-foot cross section rather than a 74-foot one avoids impacts to properties adjacent to the Blanton Street corridor.







mobility devices cross busy streets?

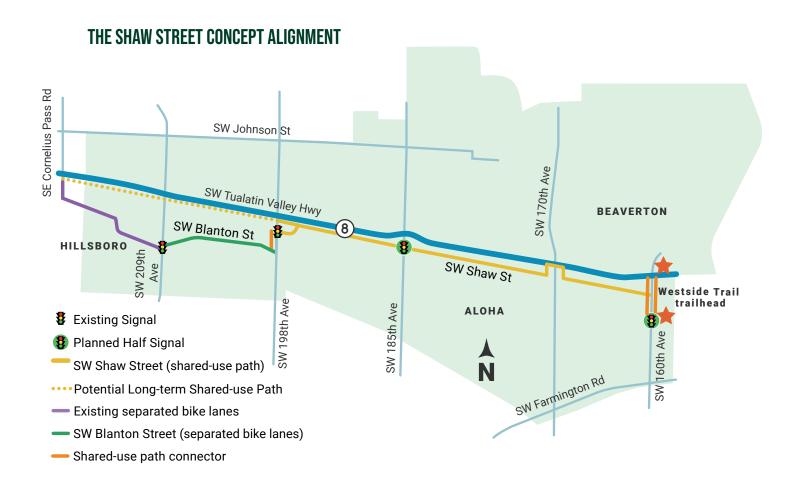
8 /// THE SHAW STREET CONCEPT



Overview

The concept trail design for the Shaw Street alignment is a shared-use path along the north side of SW Shaw Street (between Shaw Street and the railroad) from SW 198th Avenue to SW 160th Avenue. The TV Trail route would likely need to use Blanton Street west of 198th Ave in the near-term to connect to existing separated bike lanes and sidewalks at 209th Ave. However, in the longer-term, the TV Trail could connect more directly to a future segment of the TV Trail west of 209th Ave.

All major roadway crossings would be protected by existing signals or new half signals just for people crossing the street. Connections to the Westside Trail would be made at SW 160th Avenue using a path along the west side of SW 160th Avenue and a new half signal at SW Blanton Street or the existing traffic signal at TV Highway, depending on whether trail users are heading north or south on the Westside Trail.



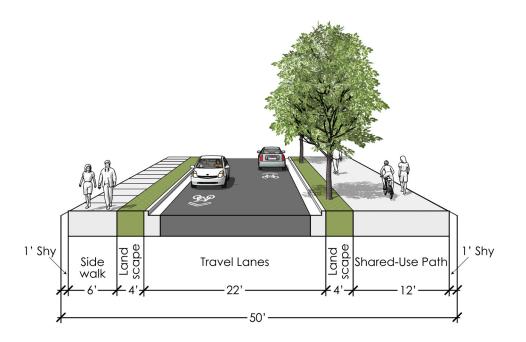
What would it look like?

The Washington County Transportation System Plan (TSP) identifies SW Shaw Street as a Local Street with a 60-foot planned width, but today, it has only 50 feet of right-of-way along much of its length. The concept design uses a typical width of approximately 50 feet to minimize property impacts. The 50-foot width may impact property owners towards the east end of the corridor, as the trail will need to remain outside the railroad's required 30-foot offset area.

TYPICAL TRAIL SECTION

The typical section for a regional trail on SW Shaw Street would include a 12-foot multiuse path on the north side of the street and a sidewalk on the south side of the street. The multi-use path and the sidewalk would be buffered from the street with a landscape strip (as shown on the next page). Sharrow pavement markings may be added for more confident cyclists that wish to ride in the roadway.

THE SHAW STREET REGIONAL TRAIL CONCEPT TYPICAL CROSS SECTION



3D VISUALIZATION OF A TYPICAL SECTION



Visualization intended for illustrative purposes only.

Protected Crossings

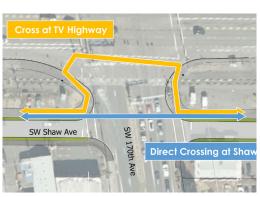
Protected crossings were evaluated and found to be warranted at each of the major intersections along the SW Shaw Street alignment. These were evaluated to determine the recommended crossing treatments based on national and local guidance. There is already an existing traffic signal at SW 198th Avenue and SW Shaw Street. The intersections at SW 185th Avenue, SW 170th Avenue, and SW 160th Avenue are not signalized and would require a half signal in order to be protected.

There are a number of challenges in providing half signals, including railroad coordination, the provision of eastbound right-turn lanes at TV Highway, and placement of the half signal equipment. Further analysis needs to be conducted to determine the technical feasibility and cost of providing these half signals.

If half signals cannot be installed at this location, trail users would need to use the protected crossings at the traffic signals at TV Highway as shown below.

DIRECT CROSSINGS COMPARED TO CROSSING AT TV HIGHWAY











How much parking is needed in the area?



Informal parking occurs along the corridor, mostly within the railroad's 30-foot offset area. While parking space is not included in the typical 50-foot section, where 60 feet of right-of-way can be acquired, consistent with the TSP, there is an opportunity to include on-street parking on the south side of the street.

SW SHAW STREET/SW 185TH AVENUE



The crossing at SW 185th Avenue would be the most inconvenient crossing in the corridor if trail users had to cross at TV Highway instead of at a half signal at Shaw Street. The figure above shows what the half signal may look like if the technical challenges can be addressed and could be approved by the railroad. Westbound movements may be prohibited in order to provide space for the signal equipment. A new eastbound right-turn lane on TV Highway is also required to make the half signal possible.



FENCING NEEDS

With improvements made within the vicinity of the railroad, fencing will likely be required along Shaw Street to channelize existing informal crossing to intersections. Coordination between the County and the railroad will be required determine responsibility of fence maintenance.



The existing railroad equipment is out-dated and does not meet current rail standards. A full rebuild of the rail crossing will require the installation of a 10' center median with post and gate arm to control northbound travel lanes when railroad equipment is activated. The space required for the 10' center median will require a general widening of the roadway to accommodate the additional width.





SW SHAW STREET/SW 170TH AVENUE



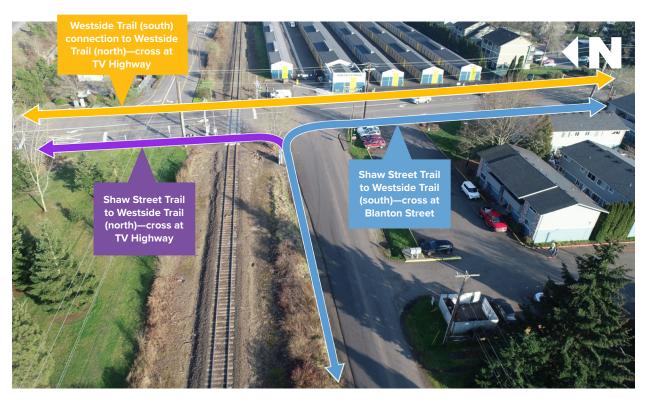
The short distance between TV Highway and Shaw Street at SW 170th Avenue makes a half signal at this location very unlikely. The crossing at TV Highway could be improved to simplify the crossing as shown in the figure above. This requires removing the pork chop island for the eastbound right-turn and relocating the signal and utilities located on the island to the corner.

RAILROAD COORDINATION



Improvements made within the vicinity of the railroad will likely trigger a railroad crossing order. Depending on the level of improvement required as part of the railroad crossing order, a full reconstruction of the railroad crossing may be warranted. Under this scenario, opportunities may exist to provide a linear and direct crossing between the east and west Shaw Street trail segments through the relocation of railroad equipment. The existing railroad equipment is out-dated and does not meet current rail standards. A full rebuild of the rail crossing will require the installation of a 10' center median with post and gate arm to control the northbound travel lanes.

SW SHAW STREET/SW 160TH AVENUE



Trail users on Shaw Street at 160th Avenue will have the opportunity to travel north to TV Highway to access transit or the Westside Trail north of TV Highway. For people with destinations south including the Westside Trail, utilizing the shared-use path along the west side of SW 160th and crossing at the Blanton Street half signal will provide a separated comfortable connection. Based on the challenges of designing and getting approval for a half signal at Shaw Street, the study team proposed a shared-use path on the west side of 160th Avenue to connect trail users to the signalized crossing at TV Highway to the north and adding a half signal at Blanton Street. This would not require trail users to travel out of their way to access a protected crossing if heading north or south to the Westside Trail.

Similar to Blanton Street, crossings are an essential element in providing an accessible, comfortable, and low-stress experience for people walking, biking, and rolling across major intersections. Widening the sidewalks crossing the railroad crossing will require extending and replacing the rail crossing panels and possibly upgrading other railroad equipment.

The study team is exploring the feasibility of a pedestrian half signal at SW 185th Avenue. However, building this will be challenging due to the proximity to the railroad and TV Highway. If this option is not feasible, people would need to cross the railroad tracks and use the existing crosswalks at TV Highway.





Additional information on the crossing analysis is included in the appendix, in the Traffic Analysis Memorandum.

RAILROAD CROSSINGS

SW Shaw Street runs parallel to the railroad. There are approved crossings of the railroad at SW 198th Avenue, SW 185th Avenue, SW 170th Avenue, and SW 160th Avenue. There are also several locations where people cross the railroad without a crossing. Based on spacing and transit access, railroad crossings should be prioritized at SW 178th Avenue and SW 192nd Avenue.

INFORMAL CROSSING AT 178TH



UTILITIES

Utilities are located on the south side of the corridor from SW 198th Avenue to SW 160th Avenue with a few utility poles located on the north side of the street west of SW 170th Avenue.

Utility poles could be located at the back of the sidewalk on the south side of the corridor. Coordination will be required with PGE to relocate the poles. In addition, further consideration should be made on undergrounding the utilities.

management, lighting, and right-of-way. Costs of stormwater management includes permanent landscaping. The crossings and potential fencing are estimated separately based on their uncertainty of cost and feasibility. The right-of-way estimate assumes that right-of-way is needed from approximately 60 properties in order to keep the improvements outside of the railroad 30-foot offset areas. The cost estimate also includes engineering and contingencies.

Costs to connect the trail to the separated bike lanes in South Hillsboro that start at SW 209th Avenue/SW Blanton Street are based on the costs to improve SW Blanton Street plus the need for a shared use path on the west side of SW 198th Avenue between SW Shaw Street and SW Blanton Street.

Construction + 30% Contingency	\$12,400,000
Engineering (30%)	\$3,700,000
Right-of-way	\$1,700,000
Shaw Sub-Total	\$17,800,000 (\$9,900,000 per mile)
SW Blanton Street (209th – 198th)	\$7,700,000
Railroad Crossings and Half Signals	\$7,700,000
Fencing	\$500,000
Total	\$33,700,000

COST ESTIMATE

A cost estimate was prepared for the SW Shaw Street corridor based on the proposed typical section of approximately 50 feet.

The cost estimate from SW 198th Avenue to SW 160th Avenue includes stormwater

9 // WHAT HAPPENS NEXT?



Source: ODOT

Questions that will need to be answered in the refinement process:

SW Blanton Street

- How much right-of-way is needed to provide an all-ages facility that meets the County's design standards? Is it possible to maintain that amount of space throughout the trail corridor?
- Is undergrounding utilities cost-feasible, and would that allow additional space to provide an all-ages facility within the existing available right-of-way, or with a minimal rightof-way acquisition from property owners?

SW Shaw Street

- Can the proposed half signals meet ODOT and the railroad requirements?
- Could SW Shaw Street be the regional trail without direct crossings?

The following table describes some of the tradeoffs between the two TV Trail route options.

How will Washington County select a preferred alignment?

How will the trail be funded?

What is the next phase for the TV Trail?

What is the timeframe for implementation?

Additional refinement will be required to choose the preferred alignment for the TV Trail. As an interim solution, complete streets improvements including sidewalk infill and improved crossings can be completed along Blanton Street. The refinement process for determining the preferred TV Trail alignment will include determining land acquisition needs, feasibility of crossing treatments, parking needs, and additional coordination with the railroad. Various State, Federal, and local funding sources should be explored as funding opportunities.

THE TWO TRAIL OPTIONS: PROS AND CONS

Corridor	Pros	Cons
SW Shaw Street	 Designed like a regional trail parallel to the street 	 Direct crossings of major streets may be expensive and difficult to
	 Intended to be accessible and comfortable for all ages and abilities 	construct. People may need to cross the railroad tracks and use crosswalks at the TV Highway intersections.
	 Close to TV Highway businesses and transit 	 Fewer community destinations for people walking, biking and rolling
	 Fewer conflicts between driveways and people walking, biking and rolling 	on Shaw Street
SW Blanton Street	 Designed like a "complete street" providing bike lanes separate from sidewalks 	May have more property impacts
		Many driveways potentially creating conflicts between people
	 Intended to be accessible and comfortable for all ages and abilities 	biking and cars entering/exiting driveways
		Not designed like a regional trail
	 Close to neighborhoods, schools and parks 	 Not as convenient to TV Highway businesses and transit service
	 More people walk, bike, and roll on Blanton today. 	

10 /// IMPLEMENTATION

Adoption Process

With direction from the Washington County Board of County Commissioners, County staff will continue refining the Blanton Street and Shaw Street alternatives to determine which should be designated as the regional trail corridor and the scope of improvements that should move forward for each corridor regardless of the regional trail designation.

The County will need to amend the Washington County TSP, and Aloha- Reedville Community Plan, and recommend including the TV Trail Concept Plan into the Regional Transportation Plan (RTP) to reflect the proposed plan for each corridor.

- Amend Washington County TSP and Community Plans: 2021/2022
- Add project to RTP: 2023

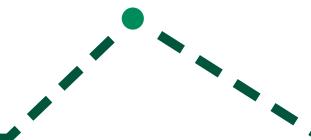
The TV Trail Concept Plan solutions can be separated into distinct near- and long-term improvements to support incremental implementation as funding sources are identified. In the near-term, improvements to Blanton Street should be pursued including sidewalk infill, wayfinding, and treatments to reduce walking, biking, and rolling exposure to motor vehicle traffic. Opportunities exist to

address these needs through redevelopment and frontage improvements.

In the long-term, Washington County should continue to pursue the trail connection along SW Shaw Street as an additional connection to the SW Blanton Street corridor. Further refinement and opportunities exist to connect the SW Shaw Street trail west to South Hillsboro and beyond.

Phasing Approach

Improvements to Blanton and Shaw Street are identified as accommodating future eastwest connectivity as part of the Tualatin Valley Trail. The Concept Plan identifies designs for potential improvements that require further refinement. The cost estimates associated with the proposed designs range from \$33.7M - 37.5M and will likely be achieved opportunistically and/or incrementally. As refinement to the Blanton and Shaw Street trail concepts is advanced, opportunities for a combined trail alignment utilizing segments of Blanton and Shaw Street should be explored. This section describes potential phasing to implement the identified improvements if pursued as a publicly funded capital project.



SW BLANTON STREET

Due to the estimated cost a segmented approach is likely for implementing the TV Trail regional vision for Blanton Street. Using the goals and evaluation criteria established for the Concept Plan segment improvements should be prioritized based on proximity to destinations, equity considerations, availability of funding and ease of implementation. The map below illustrates recommended priority segments for Blanton Street:



SW BLANTON STREET (CONTINUED)

- SW 209th Avenue and SW 198th Avenue is identified on the Major Streets Transportation Improvement Program High Growth Project List making it a likely candidate to be funded and constructed in the near-term. Due its opportunity to be funded, and that it would connect to existing cycle tracks west of SW 209th Avenue, this segment is a high priority for implementation in the near-term. The approximate cost to fund this segment is \$7.5M.
- SW 170th Avenue to the Westside Trail (east of SW 160th Avenue) has the highest planned residential density and existing proportion of low-income households and people of color within the study area. This segment provides access to Barsotti Park, connects people to the Westside Trail and based on community input as well as staff observation would benefit from traffic calming measures in the near-term. This section is classified as a neighborhood route compared to the rest of Blanton which is a collector street. The approximate cost to fund this segment is \$9M.
- Longer-term improvements will be required along Blanton Street between SW 198th Avenue and SW 170th Avenue. In 2019, the Urban Road Maintenance District Advisory Committee approved a Pedestrian and Biking Improvement project for funding in FY 2020-21 and FY 2021-22 constructing sidewalk on one side of Blanton Street between 185th and 198th avenues. The project had been on hold awaiting the outcome of the Concept Plan. There may be an opportunity to revisit that project and the best use of those funds. For example, the funding may be repurposed towards preliminary design of a complete streets project (including bicycle facilities) in this section of Blanton or towards improvements on the neighborhood route section east of 170th Avenue. The approximate cost to fund the segment of SW 198th Avenue to SW 185th Avenue is \$10.1M and the segment of SW 185th Avenue to SW 170th Avenue is \$11.5M.

SW SHAW STREET

Further refinement to Shaw Street is needed with particular emphasis on the major crossings including SW 185th Avenue, SW 170th Avenue, and SW 160th Avenue. Based on project understanding, a railroad crossing order will be required at these major intersections due to the proximity of the improvements and railroad equipment. The railroad crossing order will explore possible impacts and potential intersection retrofits to bring the existing railroad infrastructure up to standard while providing an improved crossing for trail users. SW 198th Avenue will also require improvements to accommodate the proposed transition from Shaw Street to Blanton Street, including at the existing signalized intersection at Shaw Street. The segment of SW Shaw Street between SW 209th Avenue and SW 198th Avenue will remain a refinement area as part of the County's TSP.

Frontage improvements along the south side of Shaw Street are likely to be implemented through redevelopment. The trail facility along the north side of Shaw Street will need to explore potential funding sources including State or Federal grant opportunities.

Funding Opportunities

Securing funding for the design and construction of the envisioned improvements to SW Blanton Street should be prioritized. Local, regional, federal, and state funding opportunities are identified in the table on the following page.

Program	Funding Availability	Funding Cycle	Anticipated Solicitation	Eligibility Criteria	
Local					
Major Streets Transportation Improvement Program (MSTIP)	Approximately \$35M/ year	Typically, a five-year funding program	2022	Previous MSTIP projects needed to be on the arterial network or a collector of countywide significance	
Transportation Development Tax (TDT)	Based on taxes on new developments; approximately \$15M per year	Upon request	Ongoing	TDT proceeds are used to fund capital improvements that provide additional capacity on major roads and transit lines. The program does not fund minor reconstruction or maintenance projects.	
Urban Road Maintenance District (URMD) Pedestrian and Biking Improvement Program	Approximately \$2.5M per year	Two-year funding program	2023	Proposed URMD projects must improve a specific pedestrian or biking safety concern; address a connectivity need); and be located within the URMD. Projects selected by URMD Advisory Committee.	
		Regiona	I		
Regional Flexible Funds Allocation (RFFA)	Approximately \$102M in regional commitments and \$43M in capital investments	Three-year funding program	February 2022	Projects throughout the Metro region that meet multiple transportation policy objectives	
Parks and Nature Bond Local Share Program	Approximately \$3.2M (Washington County share)	10-year program	Upon request	Prior to execution of the local share IGA, a park provider must submit a completed package that describes how their project or portfolio of projects meets bond criteria.	
Parks and Nature Bond Trails Program	Approximately \$25M	10-year program	February 2022	Protection and restoration of land, local parks and nature projects, Metro parks improvements, walking and biking trails, large-scale community visions; with a core focus on racial equity.	
		Federal			
Infrastructure for Rebuilding America (INFRA)	Approximately \$4.5B per year	Yearly	February 2022	Projects of national and regional significance that are in line with the Biden Administration's principles for nation infrastructure projects	
		State			
All Roads Transportation Safety Program (ARTS)	Approximately \$30M per cycle	Three-year funding program	Ongoing	Projects that address hotspot and systemic safety issues and concerns	
Sidewalk Improvement Program (SWIP)	Approximately \$7.4M per year	Three-year funding program	Ongoing	Builds pedestrian and bicycle facilities on state and local roads that help people moving across or around the state system.	
Statewide Transportation Improvement Program (STIP) Off- System Bike/Ped Program	Approximately \$36M for 2024-2027 (Draft)	Three-year funding program	2023	Off road walkways and bikeways or on-street connections that connect communities and provide alternatives to motorized travel or support walking and biking tourism.	
STIP Local Government Program	Approximately \$400M for 2024-2027 (Draft)	Three-year funding program	2023	Funding to local governments to fund priority projects	
Safe Routes to School Competitive Infrastructure Grant Program (SRTS)	Approximately \$30M per cycle	Two-year funding program	January 2023	Projects that improve safety for children walking or biking to school	
Oregon Community Paths (OCP)	Approximately \$36M per upcoming cycle	Three-year funding program	2023	Included as part of the STIP, funding off-street pedestrian and bicycle facility projects including multiuse paths, bicycle paths, and foot paths.	
Travel Oregon Competitive Grants Program	Approximately \$850,000 per year	Yearly	Ongoing	Projects that contribute to the development and improvement of local communities throughout the state.	
Local Government Grant Program (LGGP) Oregon Parks and Recreation Department	Approximately \$5M per year	Yearly	Ongoing	Projects involving land acquisition, development, and major rehabilitation projects that are consistent with the outdoor recreation goals and objectives contained in the Statewide Comprehensive Outdoor Recreation Plan (SCORP)	
Recreation Trails Program (RTP) Oregon Parks and Recreation Department	Approximately \$1.5M per year (maximum \$150K per project)	Yearly	Ongoing	Develop, improve, and expand motorized and non-motorized trails and their facilities.	

Operations & Maintenance

SW SHAW STREET

The proposed concept for SW Shaw Street is a shared-use path on the north side of the road. The shared use path would cross no driveways or street crossings other than the major intersections. With this traditional trail configuration, the Tualatin Hills Parks and Recreation District (THPRD) may be willing to maintain the regional trail on SW Shaw Street within the ultimate service boundary (between 160th Avenue and 196th Avenue).

SW BLANTON STREET

The proposed concept for SW Blanton Street is a "complete street" approach to providing separated facilities. Washington County currently maintains SW Blanton Street and is expected to continue serve as the lead for maintenance of the SW Blanton Street concept given the nature of the complete street build out.

11 /// APPENDICES

Appendix A: Existing and Future Conditions Report

Appendix B: Trail Alignment Alternatives and Evaluation

Appendix C: Traffic Analysis Memorandum

Appendix D: Preferred Alignment and Concept Design

Appendix E: Cost Estimate Sheets

Appendix F: Public Involvement Summary

Appendix G: THPRD Trail Design Standards

Appendix H: Washington County Board of Commissioners
Acknowledgement of TV Trail Concept Plan



MEMORANDUM

Date: July 20, 2020 Project #: 23021.002

To: Dyami Valentine, Reza Farhoodi, Washington County

Glen Bolen, Talia Jacobson, John Russell, Oregon Department of Transportation

From: Nick Gross, Juan Barajas, Susan Wright, PE, PMP

Project: TV Trail Concept Plan

Subject: Final Project Need, Goals, Objectives, and Evaluation Criteria

PROJECT NEED

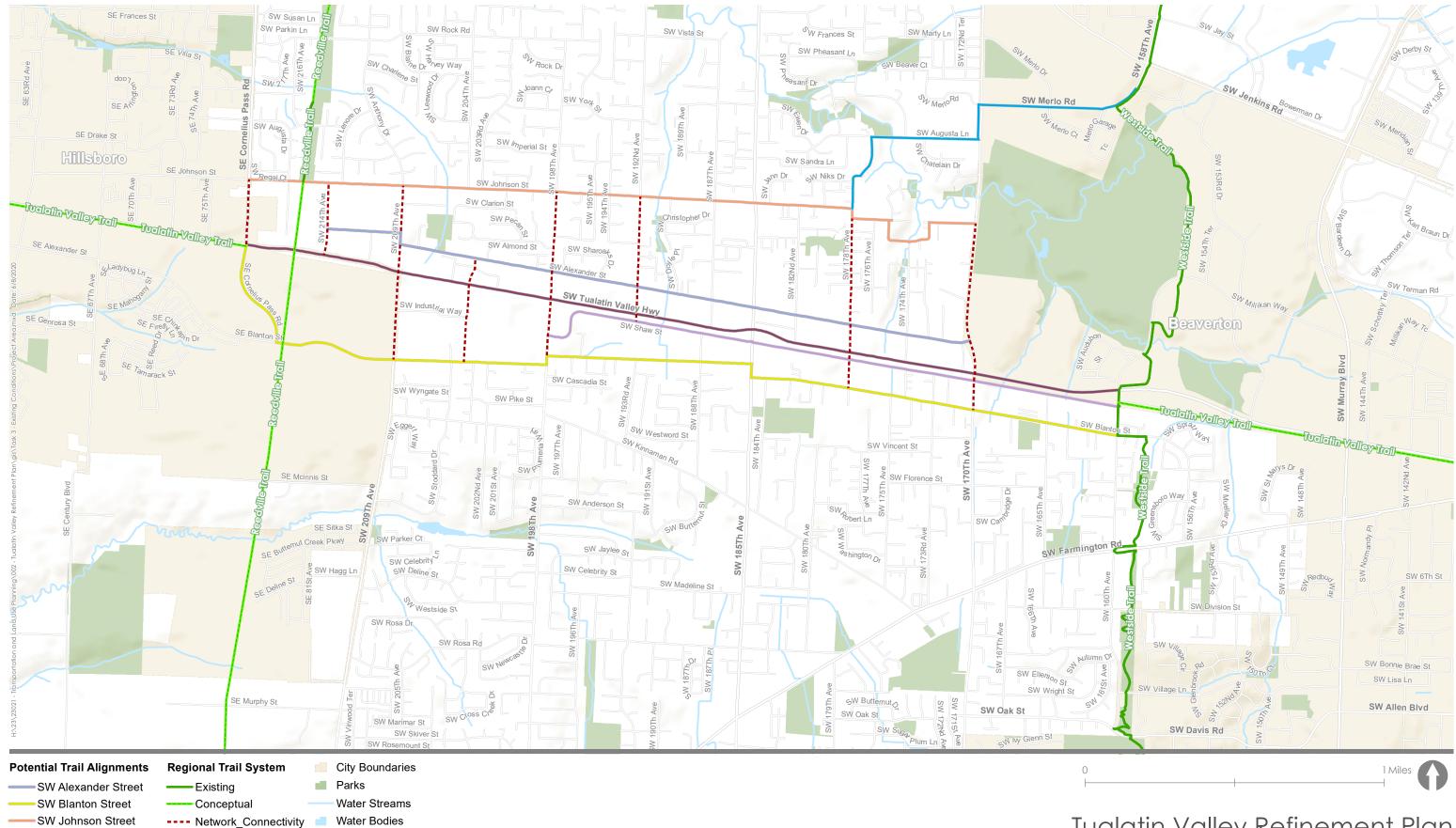
The Tualatin Valley (TV) Trail Concept Plan is a key part of the visionary surf-to-turf trail connection between the Portland metropolitan area and the Oregon coast parallel to TV Highway (OR 8). The project area for the TV Trail is centered on TV Highway from SE Cornelius Pass Road in Hillsboro, east through Aloha to SW 160th Avenue/SW Millikan Way in Beaverton.

Within this segment, the TV Trail is envisioned as a regional trail that will run parallel to the TV Highway corridor, connecting key regional and town centers in Washington County and the communities of Beaverton, Aloha, and Hillsboro, and providing much needed multimodal connections for the underserved communities within the TV Highway corridor. The TV Trail Concept Plan will establish a preferred trail alignment and design. The preferred trail alignment will provide a low-stress, east-west active transportation route, with safe and accessible connections to the essential destinations and transit service provided along TV Highway. The potential trail alignments within a half-mile buffer of the TV Highway corridor include:

- SW Johnson Street
- SW Alexander Street
- TV Highway/Railroad Right-of-Way
- SW Shaw Street
- SW Blanton Street

In order to meet the transportation and recreational needs of the surrounding communities, including users of all ages and abilities, the TV Trail will strive to achieve a level of traffic stress (LTS) 1 rating by providing a fully separated trail facility with protected street crossings at key intersections.

Figure 1 illustrates the project area including major active transportation generators and destinations.



SW Shaw Street

TV Highway

SW Augusta Lane

Tualatin Valley Refinement Plan

Figure 1

Project Area Washington County (Aloha Area), Oregon TV Trail Concept Plan

Project #: 23021.002

July 20, 2020

Page 3

GOALS, OBJECTIVES, AND EVALUATION CRITERIA

The TV Trail Concept Plan must be integrated into the existing and planned regional trail system to provide connectivity to the regional trail system while also improving local access to daily needs, services, and transit for the Aloha community. Given the varying context of these regional and local needs, the project team developed a tiered framework for evaluating the initial trail alignment alternatives and refined trail alignment alternatives.

Tier 1: Initial Screening

At its highest level, the TV Trail Concept Plan must provide a safe, efficient, and integrated trail connecting to the broader existing and planned regional trail system and must have the potential to be designed to achieve a low-stress experience. The purpose of the initial screening is to refine the five (5) potential trail alignments to three (3) alignments to be advanced into a conceptual design phase. The qualitative screening criteria for Tier 1 includes:

- Integration into the existing and planned Regional Trail Network
- Potential for Low Stress user experience

The initial qualitative screening criteria was applied to the five (5) TV Trail alignment alternatives to screen each alternative, as summarized in Table 1.

Based on the *Tier 1: Initial Screening* criteria and input provided by the TAC, the following three (3) TV Trail alignment alternatives are recommended to be advanced into the concept design phase:

- SW Johnson Street
- SW Shaw Street
- SW Blanton Street

Alexander Street and TV Highway are not recommended to be advanced based on their "poor" evaluations in one of the screening criteria.

Kittelson & Associates, Inc. Portland, Oregon

TV Trail Concept Plan

Project #: 23021.002

July 20, 2020

Page 4

Table 1: Tier 1: Initial Alignment Screening

	Johnson St	Alexander St	TV Highway	Shaw St	Blanton St
Regional Trail Network Connectivity			3	4	5
Low-Stress Environment Potential	6	7	8	9	10

Evaluation Matrix Legend:



Notes:

- 1. Connects Beaverton Creek Trail to proposed Reedville Trail
- 2. Does not connect to any regional trail without multiple turns
- 3. Direct extension of proposed Tualatin Valley Trail
- 4. Connects to Westside Trail with potential route to Tualatin Valley Trail to be explored
- 5. Connects Westside Trail to Reedville Trail/Tualatin Valley Trail
- 6. Good potential to achieve low-stress experience through design
- 7. Fair potential to achieve low-stress experience through design challenges at cross-streets due to proximity to TV Highway
- 8. Poor potential to achieve low-stress experience through design due to proximity of trail to TV Highway and the traffic noise, speed, and volumes even if the facility could be separated with a barrier.
- 9. Fair potential to achieve low-stress experience through design challenges at cross-streets due to proximity to TV Highway
- 10. Good potential to achieve low-stress experience through design

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Tier 2: Refined Concept Screening

The *Tier 2: Refined Concept Screening* will be applied to the three (3) alignments recommended for advancement. The refined concept screening will rely on the full set of goals, objectives, and evaluation criteria will be used to set the vision for user experience along the TV Trail and framework for successfully implementation. These elements are defined as follows:

- Goals: Provide vision and aspiration for project outcomes.
- Objectives: Refined descriptions and framework on how goals can be accomplished.
- Evaluation Criteria: Measurable achievements; both qualitative and quantitative, to gauge progress towards the project success.

Table 2 summarizes the goals, objectives, evaluation criteria, and measures for the refined concept screening of the three (3) TV Trail alternatives recommended for advancement. The goals and objectives are based on a review of prior planning efforts in the project area; direction from policymakers and the project management team (PMT); and public as well as stakeholder input.

Table 2: Goals, Objectives, and Evaluation Criteria

Goal	Objectives	Evaluation Criteria	Measures
Safety	 Reduce the potential frequency and severity of crashes involving people walking and biking on or parallel to TV Highway. Reduce the potential frequency and severity of crashes involving people walking and biking across TV Highway, intending to access the potential trail. 	 Does the trail alternative reduce the potential frequency and severity of crashes involving potential trail user compared to existing facilities? (yes/no, to what extent?). Does the trail alternative maximize separation between vehicles and trail users at crossings where potential users will access the trail or minimize the number of needed crossings? (yes/no, to what extent?). 	Number of intersection crossings by type and number of lanes (i.e. stop control vs. signalized crossing, dedicated phasing for crossing, number of lanes to cross).
Connectivity	 Provide new and improved access to daily needs and services. Increase connections to community destinations including schools, transit stops, parks and recreation facilities, employment areas, regional centers, and the broader trail network. 	 Does the trail alternative provide new connections to enhance access to daily needs and services for people walking, biking, and taking public transit? (yes/no, to what extent?). Does the trail alternative increase the number of destinations accessible by walking, biking, or public transit for residents? (yes/no, to what extent?). 	 Proximity to essential destinations/daily needs (# of destinations adjacent to trail and within ¼ mile). Number of transit stops within ¼ mile.
Health/Livability	 Incorporate design elements that increase community livability by maximizing access to recreation. Minimize exposure for people walking and biking to air toxins and particulate matter. 	 Is the trail alternative located to maximize recreation access for people within a ¼ mile of the trail? (yes/no, to what extent?). Is the trail alternative located to minimize exposure to air toxins and particulate matter? 	 Proximity to parks/open space/schools (# of schools and parks adjacent to trail and within ¼ mile). Adjacent traffic volumes.
Coordination	 Incorporate and build from previous plans for the study area. Coordinate with neighboring jurisdictions and area partners to provide consistency with other area plans. Provide a clear plan for the area, including an implementation strategy. 	 Has the trail alternative considered previous planning efforts within the TV Highway corridor? (yes/no, to what extent?). Neighboring jurisdictions and area partners providing comments on the plan during development (yes/no, to what extent?). Does the trail alternative identify cost, timeline, and potential funding strategies (yes/no, to what extent?). 	 Planning level cost estimate. Coordination agencies and issues (i.e. railroad, Washington County, Aloha, Hillsboro, Beaverton by # and type of coordination issues).
Feasibility	 Accurately and clearly identify the feasibility of potential alternatives. Consider anticipated costs, funding sources, environmental impacts, right-of-way, and permitting. Consider potential impacts to railroad and potential railroad relocation? 	 Is the alignment alternative feasible from a funding, environmental, right-of-way, and permitting perspective? (yes/no, to what extent?). Concept has concurrence from the railroad (yes/no). 	Significant Impacts (i.e. environmental, right-of-way, railroad, etc. by # and type).
Equity	 Provide a comfortable trail facility that meets the needs of all users and abilities. Provide equitable access to the trail for transportation disadvantaged populations underserved by recreational facilities 	 Does the alignment alternative provide for a comfortable facility that can meet the needs of all users and abilities by providing the lowest stress facility possible? (yes/no, to what extent?). Does the alignment service higher portions of transportation disadvantaged population than the average for the area? 	 Buffer space and adjacent traffic volumes. Traffic speed and noise levels. Percent of population within ¼ mile of facility considered transportation disadvantaged.

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NEXT STEPS

The goals, objectives, evaluation criteria, and measures have been reviewed and refined based on input provided by the Technical Advisory Committee (TAC). The final three alignments advanced for refinement will be determined based on input from the Stakeholder Advisory Committee (SAC).

The objectives will then guide the development of three concept level alternatives. The evaluation criteria and measures will be applied to help refine the concepts and select a preferred alternative, with stakeholder input, and ensure that the final plan meets the project objectives.

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MEMORANDUM

Date: October 16, 2020 Project #: 23021.002

To: Dyami Valentine, Reza Farhoodi, Washington County

Glen Bolen, Talia Jacobson, John Russell, Oregon Department of Transportation

From: Nicholas Gross, Juan Barajas, Susan Wright, PE, PMP

Project: TV Trail Concept Plan

Subject: Trail Alignment Alternatives & Evaluation Memorandum

PURPOSE

The purpose of this memorandum is to 1) determine the most feasible and context appropriate facility type for each of the potential trail alignments and 2) evaluate the potential trail alignments comparatively to determine which trail alignment most closely aligns with the project vision and goals.

The three trail alignments selected as part of the initial Tier 1 screening process include:

- SW Johnson Street (Alternative A & Alternative B)
- SW Shaw Street (Alternative A & Alternative B)
- SW Blanton Street

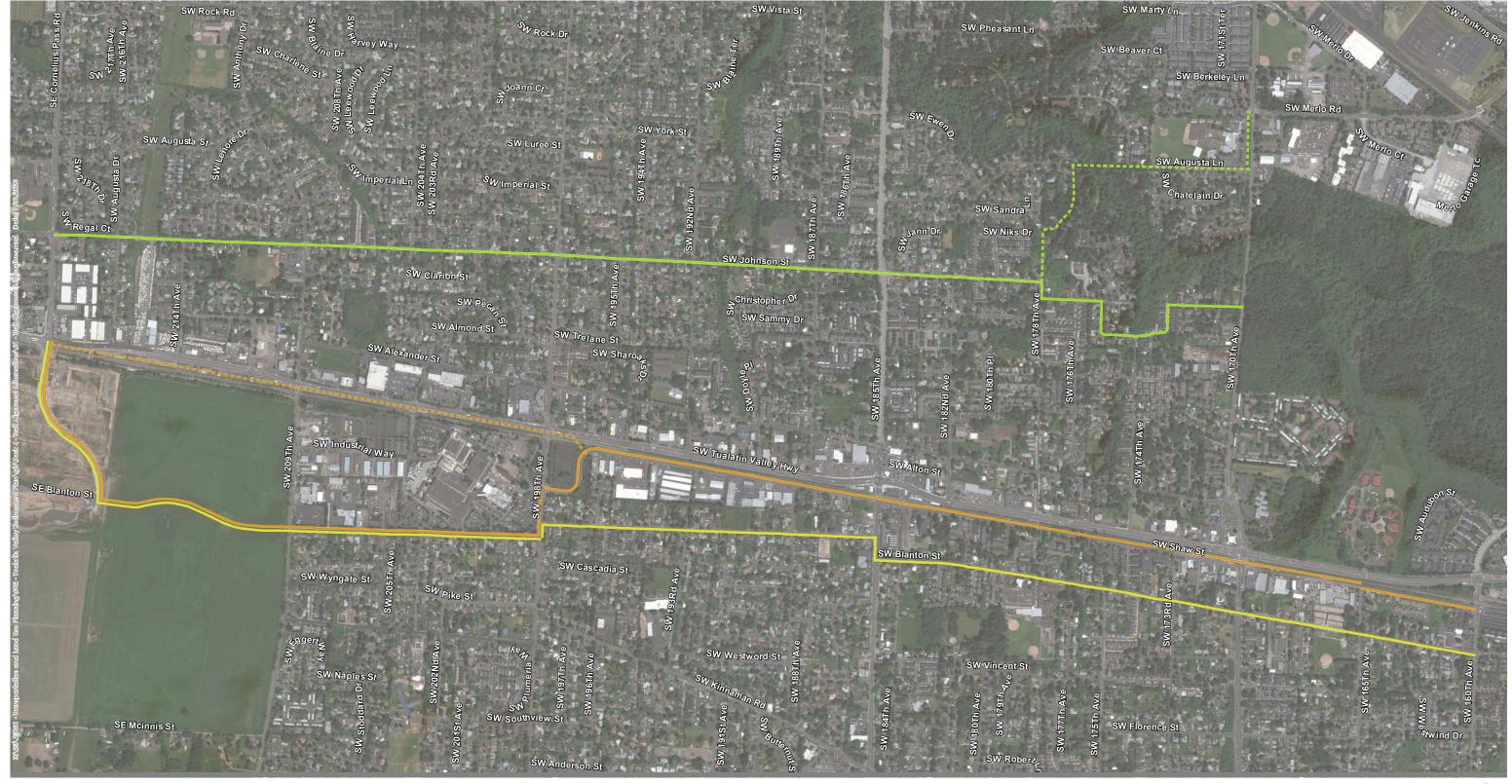
The trail alternatives were developed based on national and local design guidance for developing low traffic-stress walking and biking facilities, assessing the existing and planned conditions, identifying location specific constraints and opportunities, and determining the most feasible regional trail facility solution for each trail alignment.

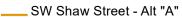
The trail alignment evaluation analyzed each alignment by applying the evaluation criteria established in the Project Need, Goals, Objectives, and Evaluation Criteria memorandum (Reference 1).

The potential trail alternatives vary between each alignment based on opportunities and constraints including existing and planned right-of-way, number of conflict points (e.g. intersection crossings, number of driveways), and surrounding land uses and destinations. Ultimately, the preferred trail alignment will be selected based on a combination of how well the alternatives perform against the evaluation criteria, in addition to stakeholder and public input.

Figure 1 illustrates the potential trail alignment selected as part of the initial Tier 1 screening process.

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---- SW Shaw Street - Alt "B"

—— SW Johnson Street - Alt "A"

---- SW Johnson Street - Alt "B"

SW Blanton Street









Tualatin Valley Refinement Plan

Eiguro

Trail Alignment Alternatives Washington County (Aloha Area), Oregon

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TRAIL ALTERNATIVES

This section summarizes the findings of the trail alternatives analysis and includes conceptual trail cross sections and enhanced crossing facilities based on the context of the potential trail alignments.

Multimodal Analysis

This section summarizes the results of a multimodal transportation analysis, including bicycle level of traffic stress and multimodal level of service for pedestrians on the existing facilities. For both analyses, the results of the lowest performing sections were assumed on full corridor segments. For example, if some sections of SW Blanton Street have existing sidewalks while other sections are lacking sidewalks, the analysis assumed no sidewalks are provided for the entire corridor. This approach was selected due to the context and overarching need of the project to provide a regional trail facility and the assumption that people traveling along the future trail may have the desire to travel its full length.

Level of Traffic Stress

ODOT's Analysis Procedures Manual (APM) provides a methodology for evaluating bicycle facilities within urban and rural environments called Bicycle Level of Traffic Stress (BLTS). As applied by ODOT, this methodology classifies four levels of traffic stress that a person biking can experience on the roadway, ranging from BLTS 1 (little traffic stress) to BLTS 4 (high traffic stress). A road segment that is rated BLTS 1 generally has low traffic volumes and travel speeds and is suitable for all, including children. A road segment that is rated BLTS 4 generally has high traffic volumes and travel speeds and is perceived as unsafe by most adults. Per the APM, LTS 2 is considered a reasonable target due to its suitability with the majority of people.

All three potential trail alignment corridors currently operate as mixed traffic segments with no centerline. As a result, BLTS ratings are based on the speed of the roadway, average daily traffic (ADT), functional classification, and number of travel lanes per direction. Table 1 summarizes the existing BLTS ratings for each of the potential trail alignments.

Table 1: Bicycle Level of Traffic Stress (LTS) Results

		LTS Criteria								
Street	ADT¹	Function Classification	Speed (MPH)	Lanes per Direction	BLTS Score					
SW Johnson Street	>3,000	Collector	32 – 34 ²	1	3					
SW Shaw Street	750 - <=1,500 ⁴	Neighborhood	35 ⁴	1	3					
SW Blanton Street (West of SW 170 th Avenue)	>=3,000	Collector	31 – 33 ²	1	3					
SW Blanton Street (East of SW 170 th Avenue)	>=3,000	Neighborhood	31 – 33 ²	1	3					

1. ADT based on traffic data provided by Washington County and rounded to ADT ranges identified in ODOT APM

As summarized in Table 1, all potential trail alignments result in a rating of LTS 3. This is primarily due to the posted and 85th percentile speeds exceeding 30 MPH.

^{2.} Based on 85th Percentile

^{3.} Posted speed

^{4.} ADT based on 2009 traffic count data.

Multimodal Level of Service

ODOT's APM provides a simplified multimodal level of service (MMLOS) spreadsheet for use in calculating MMLOS scores for pedestrian and bicycle facilities. MMLOS is intended for use when a detailed analysis is desired such as in facility plans or projects when a no-build alternative is compared to one or more build alternatives.

The pedestrian MMLOS score is based on number of lanes, sidewalk width, speed limit, and directional volume. Table 2 summarizes the existing MMLOS ratings for pedestrian facilities along each of the potential trail alignments.

Table 2: Pedestrian Multimodal Level of Service (MMLOS) Results

	Number	Sidewalk	Canad	Directional Ho	MMLOS		
Street	of Lanes	Width	Speed (MPH)	High	Medium	Score	
SW Johnson Street	1	N/A¹	<=40	<1,500	>500	С	
SW Shaw Street	1	N/A¹	<=40	<1,500	<500	В	
SW Blanton Street (West of SW 170 th Avenue)	1	N/A¹	<=40	<1,500	>500	С	
SW Blanton Street (East of SW 170 th Avenue)	1	N/A¹	<=40	<1,500	>500	С	

^{1.} No sidewalks or sidewalk gaps

Regional Trail Facility Needs & Expectations

As a regional trail facility, the expectation is that a rating of LTS 1 or MMLOS score "A" must be achieved. As stated previously, BLTS 1 is suitable for users including children. For SW Johnson Street and SW Blanton Street to achieve a reasonable BLTS score (BLTS 1) assuming ADT and speed remain constant, buffered or fully separated bicycle facilities must be provided. Similarly, for potential trail alignment corridors to achieve a MMLOS score of "A", sidewalks must be provided at a minimum, while landscaped buffered sidewalks are preferred. The regional trail facility need can be achieved by providing a fully separated facility. In some scenarios, like SW Shaw Street, people biking could be accommodated under a low stress environment in the roadway; however, this is not preferred for such a long segment of a regional trail facility.

^{2.} Hourly volumes estimated based ADT.

Guidance for Regional Trail Facilities

Metro's Design Livable Streets and Trails Guide (Guide – Reference 3) provides guidance on the planning, design, and performance-based decision-making approach for developing regional trails. The Guide was reviewed to determine appropriate facility treatments and design parameters including potential cross sections applicable for the Tualatin Valley (TV) Trail based on the surrounding context of potential trail alignments.

Regional and Community Streets

Based on a review, the Regional and Community Street design parameters and definition most closely reflect the goals, objectives and vision of the TV Highway Trail Concept Plan as well as the surrounding characteristics of the alternative alignments. Figure 2 illustrates a conceptual rendering example of a Community Street trail.

Figure 2: Community Street Regional Trail



"Regional and community streets balance the multimodal travel and access needs of corridors, neighborhoods, and some main streets, along with employment and industrial areas. Regional and community streets can be located within residential neighborhoods as well as more densely developed corridors and employment centers. Development can be set back from the street. Regional and community streets can also serve as main streets with buildings oriented toward them at major intersections and transit stops" – Metro's Designing Livable Streets and Trails Guide.

The design principles and elements identified in Chapter 4 of the Guide are used to develop the concept design cross sections illustrated in the following section of this memorandum. These design principles and elements include but are not limited to trail width, right-of-way allocation, cross section elements and delineation, and overall facility type based on surrounding contexts.

Cross Section Alternatives

The following section describes and illustrates the potential cross section alternatives based on the existing and planned right-of-way (ROW)¹, with considerations to adjacent property impacts. The cross sections described in the following section would all achieve a low-stress experience for trail users by providing fully separated accommodations for people walking and biking. *Maps of the existing and planned right-of-way for each corridor are included in Attachment A.*

While each example cross section identifies specific elements and dimensions within the identified ROW, adjusting cross section elements and dimensions will likely be required to fit the context of each potential trail alignment more accurately. Each ROW cross section (74-foot, 60-foot, 50-foot, and 40-foot) provides an example of a one-sided trail facility as well as a two-sided fully separated walking and biking facilities. For the example cross sections with a one-sided trail facility, developing one side of the roadway should be considered as an interim solution to minimize impacts.

74-Foot Cross Section

Based on the planned ROW for **SW Johnson Street and SW Blanton Street (west of SW 170th Avenue)**, two 74-foot regional trail cross sections were developed and are illustrated in Figure 3 and Figure 4.

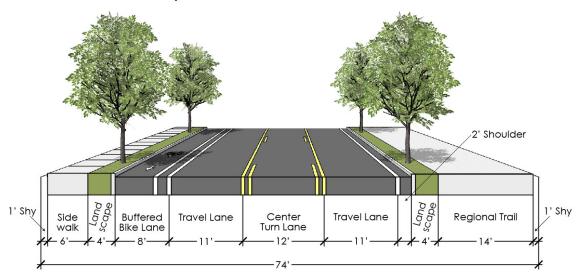


Figure 3: 74-foot Cross Section – Option A

As illustrated in Figure 3, the curb-to-curb cross section includes three vehicular travel lanes (one centerturn lane), and one buffered or protected bike lane opposite the regional trail facility. Beyond the curb, landscape buffers are provided on both sides with a sidewalk located on the opposite side of the regional trail facility. Under this cross-section alternative, the regional trail facility is located on **one side** of the roadway with walking and biking accommodations provided on the opposite side.

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¹ Existing ROW maps are included in Appendix A.

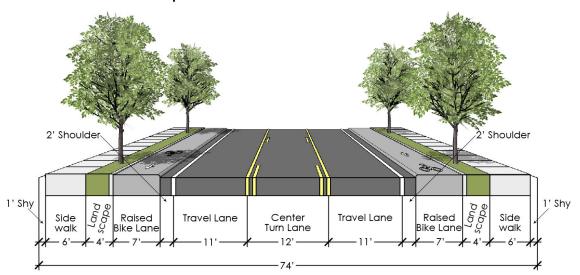
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Figure 4: 74-foot Cross Section – Option B

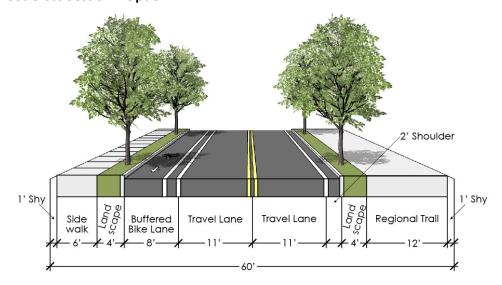


As illustrated in Figure 4, the curb-to-curb cross section includes three vehicular travel lanes (one centerturn lane), and two raised (separated) bike lanes in both directions. Beyond the curb, landscape buffers are provided on both sides of the road, with sidewalks located on the back side of the landscaping strip. Under this scenario, the regional trail facility is a combination of separated bi-direction facilities on both sides of the roadway.

60-Foot Cross Section

A 60-foot cross section was developed for consideration along **SW Johnson Street and SW Blanton Street** as an alternative with less impacts to adjacent properties compared to the 74-foot cross section. Figure 5 through Figure 8 illustrate the potential regional trail cross sections for the 60-foot ROW.

Figure 5: 60-Foot Cross Section - Option A



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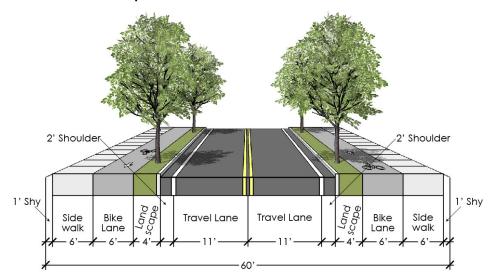
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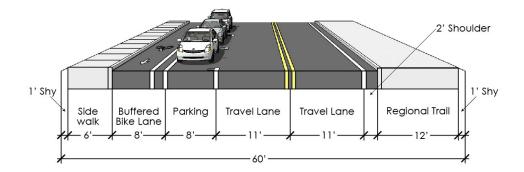
As illustrated in Figure 5, the curb-to-curb cross section includes two vehicular travel lanes and one buffered or protected bike lane opposite the regional trail facility. Beyond the curb, landscape buffers are provided on both sides of the road with a sidewalk located on the opposite side of the regional trail facility. Under this cross-section alternative, the regional trail facility is located on one side of the roadway with walking and biking accommodations provided on the opposite side.

Figure 6: 60-Foot Cross Section - Option B



As illustrated in Figure 6, the curb-to-curb cross section includes two vehicular travel lanes with 2-foot shoulders on either side of the roadway. Beyond the curb, landscape buffers are provided on both sides of the road, (separated) bike lanes and sidewalks located on the back side of the landscaping strip. Under this scenario, the regional trail facility is a combination of separated bi-direction facilities on both sides of the roadway.

Figure 7: 60-Foot Cross Section – Option C



As illustrated in Figure 7, the curb-to-curb cross section includes two 11-foot travel lanes, one 8-foot parking lane, and a parking protected buffered bike lane opposite the regional trail facility. A 2-foot shoulder is provided adjacent to the regional trail resulting in an overall curb-to-curb width of 60 feet.

Figure 8: 60-Foot Cross Section – Intersection Approach

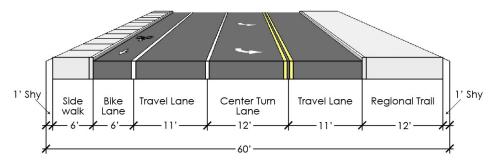
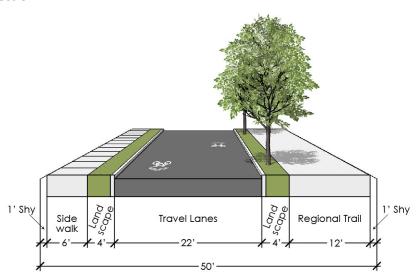


Figure 8 illustrates a conceptual 60-foot cross section for intersection approaches such as when crossing roads such as SW 185th Avenue and a side-street left-turn lane is needed. A combination of the landscape and shoulder space illustrated in Figure 6 is utilized to provided center turn lane. Having curb-tight pedestrian and bicycle facilities at intersections can help to increase the visibility of pedestrians and cyclists at intersections.

50-Foot Cross Section

A 50-foot cross section was developed for consideration along **SW Shaw Street** based on a review of the existing and planned ROW with consideration of the railroad offset on the north side of the road. While the Washington County TSP designates a 60-foot ROW for SW Shaw Street, the ROW is constrained due to the 30-foot railroad off-set. Implementing a 50-foot cross section while avoiding the railroad off-set will likely require encroaching into the existing parcels on the south side of the roadway. Figure 10 illustrates the potential regional trail cross sections for the 50-foot ROW.

Figure 9: 50-Foot Cross Section

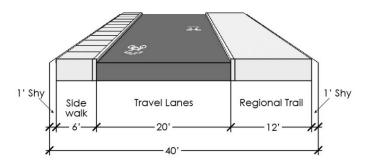


As illustrated in Figure 9, the curb-to-curb cross section is 22 feet with two vehicular travel lanes (no center striping) and shared-lane markings "sharrows". Beyond the curb, a 6-foot sidewalk and 12-foot regional trail is provided separated by landscaping strips. Under this cross-section alternative, the regional trail facility is located on **one side** of the roadway with walking accommodations provided on the opposite side.

40-Foot Cross Section

A 40-foot cross section was developed for consideration along **SW Shaw Street** based on a review of the existing and planned ROW with consideration of the railroad offset on the north side of the road. Figure 10 and Figure 11 illustrate the potential regional trail cross sections for the 40-foot ROW.

Figure 10: 40-Foot Cross Section - Option A



As illustrated in Figure 10, the curb-to-curb cross section is 22 feet and includes two vehicular travel lanes (no center striping) with shared-lane markings "sharrows". A curb tight sidewalk is provided on the opposite side of the regional trail. Under this cross-section alternative, the regional trail facility is located on **one side** of the roadway with walking accommodations provided on the opposite side.

Figure 11: 40-Foot Cross Section - Option B

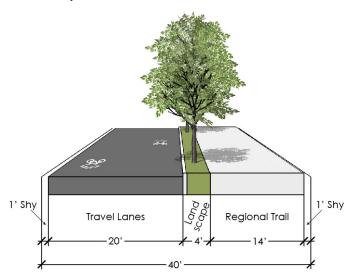


Figure 11 illustrates an alternative cross section providing a landscape buffer between the roadway and regional trail – increasing level of separation and decreasing level of traffic stress. Under this cross-section alternative, the regional trail facility is located on **one side** of the roadway and no walking accommodations are provided on the opposite side.

An alternative for intersection approaches was not developed for the 40-foot Shaw Street alternative due to all intersection approaches being access controlled with left-turn movements precluded.

Guidance for Enhanced Crossing Facilities

The Federal Highway Administration (FHWA) *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* (Reference 4) provides guidance on the selection of enhanced crossing facilities and countermeasure options based on posted speed limit, average annual daily traffic (AADT), and roadway configuration. Exhibit 1 illustrates the application of pedestrian crash countermeasures by roadway feature type. The matrix indicates the possibilities that may be appropriate for designated pedestrian and bicycle crossings.

Enhanced Crossing Countermeasures by Roadway Feature Type

Exhibit 1: Application of Pedestrian Crash Countermeasures by Roadway Feature Type

									P	oste	ed	Spe	eed	Lir	nit	ar	nd A	AD	T							
		V	Vehicle AADT <9,000						Ve	hic	le A	ADT	9,0	000	-15	5,00	0		Vel	nicl	e AA	DT:	>15	5,00	0	
Roadway Configuration	≤3	0 m	ph	35	5 m	ph	≥4	0 m	nph	≤30) m	ph	35	mp	h	≥4	0 m	ph	≤3	0 m	ph	35	mp	h	≥40) mp
2 lanes (1 lane in each direction)	4	2 5	6	7	5	6 9	①	5	6 ②	4	5	6	7	5	6	①	5	6 ②	1 4 7	5	6	① 7	5	6 9	①	5
3 lanes with raised median (1 lane in each direction)	4	2 5	3	7	5	9	①	5	③	① 4 7	5	3	①	5	©	①	5	0	① 4 7	5	9	①	5	8	①	5
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	1 4 7	2 5	3 6 9	7	5	6 9	①	5	6	① 4 7	5	3 6 9	①	5	② 6 ②	1	5	③ 6 ⊙	① 4 7	5	③ 6 9	1	5	6 0	① 5	6
4+ lanes with raised median (2 or more lanes in each direction)	7	5 8	9	7	5 8	9	1	5 8	③	① 7	5 8	છ 9	① •	5	0	1	5	0	① •	5	0	1	5	0	1	5 8
4+ lanes w/o raised median (2 or more lanes in each direction)	7	5 8	6 9	① 7	5 8	6 6 9	1	5 8	3 0 0	① 7	5 8	② ③ 9	1	5	3 0 0	①	5	③ ⊙	①	5	⊚ ⊙	1	5	6 6 0	1	5 (
7 8 9 7 8 9 8 0 7 8 9 8 0																										

- Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- 2 Raised crosswalk
- 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- 4 In-Street Pedestrian Crossing sign
- 5 Curb extension
- 6 Pedestrian refuge island
- 7 Rectangular Rapid-Flashing Beacon (RRFB)**
- 8 Road Diet
- 9 Pedestrian Hybrid Beacon (PHB)**

Key crossings for enhanced crossing treatment considerations include SE Cornelius Pass Road, SW 209th Avenue, SW 198th Avenue, SW 185th Avenue, SW 170th Avenue, and SW 160th Avenue/SW Millikan Way. Based on the roadway configuration, posted speed limit, and AADT, all key crossings are recommended for enhanced crossing countermeasures.

Enhanced Crossing Treatments

The following section describes, illustrates, and provides real life examples of potential enhanced crossing facilities that could be considered for installation at key crossings for each alignment alternative. The crossing facilities described in the following section would all achieve a low-stress experience for trail users by providing dedicated phasing or increase visibility for people crossing the roadway.

Rectangular Rapid Flashing Beacon (RRFB)

RRFBs are typically located on multi-lane or two-lane roadways at unsignalized locations. Additional separation or enhanced crossings with a "RED" indication are typically needed on roadways with more than three-lanes. RRFBs are activated through push button indication or passive activation through detection. Once activated, RRFBs use an irregular flash pattern with yellow amber LEDs to alert motorists that a person is crossing the roadway.

Where feasible, pedestrian refuge islands are recommended to provide a designated space for people crossing. Advance Yield Here to (Stop Here For) Pedestrian signs and yield (Stop Line) is always recommended as a complementary countermeasure to increase motorist yielding compliance. RRFBs should not be installed at or near signalized intersections. Exhibit 2 illustrates a RRFB application on SW Bontia Road in Tigard, OR.

Exhibit 2: Rectangular Rapid Flashing Beacon (RRFB) Example



The example shown in Exhibit 2 illustrates post-mounted RRFBs with a refuge median island. This RRFB example is located on a 3-lane roadway with one travel lanes in each direction. Similar roadway context and treatments could be considered along SW Johnson Street at SW 170th Avenue, and along SW Blanton Street at SW 198th Avenue, SW 185th Avenue, and SW 160th Avenue. RRFBs are likely not appropriate along SW Shaw Street due to the proximity of the railroad and signalized intersections along TV Highway.

High Intensity Activated Crosswalk "HAWK" / Pedestrian Hybrid Beacon (PHB) Signal

High intensity activated crosswalk "HAWK" or Pedestrian Hybrid Beacon (PHB) are typically located on multi-lane roadways at unsignalized locations. Similar to RRFBs, HAWK / PHB are activated through push button indication or passive activation through detection. Once activated the HAWK / PHB signal sequences pattern includes a flashing yellow, solid yellow, followed by solid red. Exhibit 3 illustrates a HAWK / PHB application on NE Broadway Street in Portland, OR.

Exhibit 3: HAWK/PHB Example



The example shown in Exhibit 3 is a typical application of a HAWK / PHB signal. This HAWK / PHB example is located on a four-lane roadway with two travel lanes in both directions. The HAWK / PHB signal is mounted on a mast arm along with crosswalk signage.

Similar roadway context and treatments could be considered along SW Johnson Street at SW 170th Avenue, and along SW Blanton Street at SW 198th Avenue, SW 185th Avenue, SW 160th Avenue. HAWK / PHBs are likely not appropriate along SW Shaw Street due to the proximity of the railroad and signalized intersections along TV Highway.

Pedestrian Half Signal

Pedestrian half signals operate similarly to HAWK / PHBs signals and are typically located on multi-lane roadways. The main difference between a Pedestrian Half Signal and a HAWK / PHB is that a Pedestrian Half Signal rest in GREEN and resembles a typical traffic control signal in appearance with three vertical lights.

One of the largest benefits of a Pedestrian Half Signal is its ability to be coordinated with adjacent traffic signals up and down stream of its location. Traffic signal coordination can improve operations and safety while improving corridor capacity. Exhibit 4 illustrates a Pedestrian Half Signal located at NE Century Boulevard in Hillsboro, OR.

Exhibit 4: Pedestrian Half Signal Example



The example shown in Exhibit 4 is located just east of the Orenco/NW 231st Avenue MAX station and programmed to be coordinated with the railroad signals and infrastructure.

Similar roadway context and treatments could be considered along SW Blanton Street at SW 198th Avenue, SW 185th Avenue, SW 160th Avenue and along SW Shaw Street at SW 209th Avenue, SW 198th Avenue, SW 185th Avenue, 170th Avenue, and SW 160th Avenue.

EVALUATION CRITERIA

Table 3 summarizes the goals, objectives, evaluation criteria, and measures for the refined concept screening of the three TV Trail alternatives recommended for advancement. The goals and objectives are based on a review of prior planning efforts in the project area; direction from policymakers and the project management team (PMT); and public as well as stakeholder input. The measures below have been evaluated for each alignment alternative and are summarized in the following sections by Goal area.

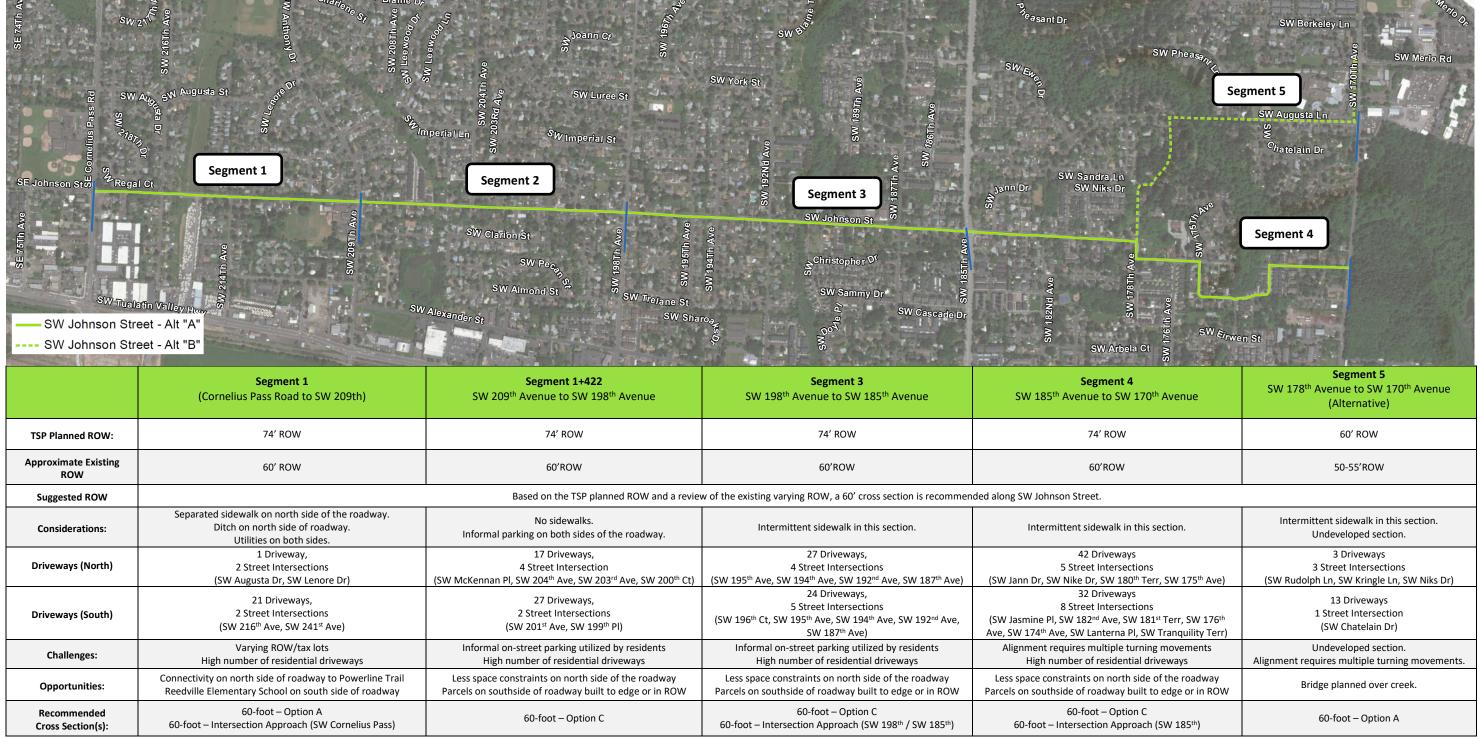
Table 3: Goals, Objectives, and Evaluation Criteria

Goal	Objectives	Evaluation Criteria	Measures
Safety	 Reduce the potential frequency and severity of crashes involving people walking and biking on or parallel to TV Highway. Reduce the potential frequency and severity of crashes involving people walking and biking across TV Highway, intending to access the potential trail. 	 Does the trail alternative reduce the potential frequency and severity of crashes involving potential trail user compared to existing facilities? (yes/no, to what extent?). Does the trail alternative maximize separation between vehicles and trail users at crossings where potential users will access the trail or minimize the number of needed crossings? (yes/no, to what extent?). 	Number of intersection crossings by type and number of lanes (i.e. stop control vs. signalized crossing, dedicated phasing for crossing, number of lanes to cross).
Connectivity	 Provide new and improved access to daily needs and services. Increase connections to community destinations including schools, transit stops, parks and recreation facilities, employment areas, regional centers, and the broader trail network. 	 Does the trail alternative provide new connections to enhance access to daily needs and services for people walking, biking, and taking public transit? (yes/no, to what extent?). Does the trail alternative increase the number of destinations accessible by walking, biking, or public transit for residents? (yes/no, to what extent?). 	 Proximity to essential destinations/daily needs (# of destinations adjacent to trail and within ¼ mile). Number of transit stops within ¼ and ½ mile.
Health/Livability	 Incorporate design elements that increase community livability by maximizing access to recreation. Minimize exposure for people walking and biking to air toxins and particulate matter. 	 Is the trail alternative located to maximize recreation access for people within a ¼ mile of the trail? (yes/no, to what extent?). Is the trail alternative located to minimize exposure to air toxins and particulate matter? 	 Proximity to parks/open space/schools (# of schools and parks adjacent to trail and within ¼ mile). Adjacent traffic volumes.
Coordination	 Incorporate and build from previous plans for the study area. Coordinate with neighboring jurisdictions and area partners to provide consistency with other area plans. Provide a clear plan for the area, including an implementation strategy. 	 Has the trail alternative considered previous planning efforts within the TV Highway corridor? (yes/no, to what extent?). Neighboring jurisdictions and area partners providing comments on the plan during development (yes/no, to what extent?). Does the trail alternative identify cost, timeline, and potential funding strategies (yes/no, to what extent?). 	 Planning level cost estimate. Coordination agencies and issues (i.e. railroad, Washington County, Aloha, Hillsboro, Beaverton by # and type of coordination issues).
Feasibility	 Accurately and clearly identify the feasibility of potential alternatives. Consider anticipated costs, funding sources, environmental impacts, right-of-way, and permitting. Consider potential impacts to railroad and potential railroad relocation? 	 Is the alignment alternative feasible from a funding, environmental, right-of-way, and permitting perspective? (yes/no, to what extent?). Concept has concurrence from the railroad (yes/no). 	Significant Impacts (i.e. environmental, right-of-way, railroad, etc. by # and type).
Equity	 Provide a comfortable trail facility that meets the needs of all users and abilities. Provide equitable access to the trail for transportation disadvantaged populations underserved by recreational facilities 	 Does the alignment alternative provide for a comfortable facility that can meet the needs of all users and abilities by providing the lowest stress facility possible? (yes/no, to what extent?). Does the alignment service higher portions of transportation disadvantaged population than the average for the area? 	 Buffer space and adjacent traffic volumes. Traffic speed and noise levels. Percent of population within ¼ mile of facility considered transportation disadvantaged.

SW JOHNSON STREET

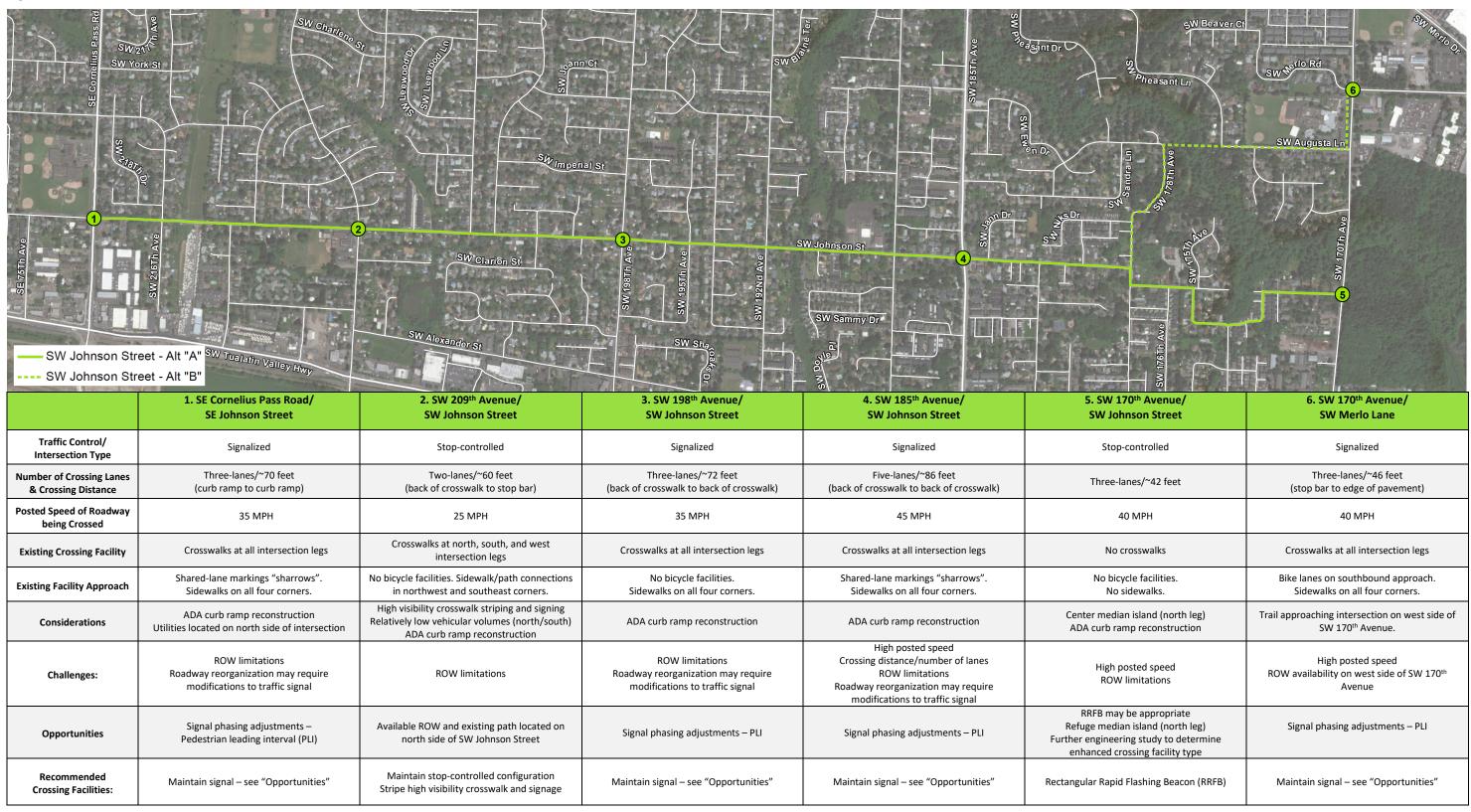
The following section summarizes the considerations, challenges, and opportunities for implementing the TV Trail concept along SW Johnson Street. Figure 12 summarizes the key segment considerations including cross section alternatives while Figure 13 summarizes key crossing considerations including level of separation and enhanced facility types.

Figure 12: SW Johnson Street – Segments



Note: 60-foot – Option A includes a 12-foot regional trail on one side. 60-foot – Option C includes a 12-foot regional trail on one side with a center turn lane.

Figure 13: SW Johnson Street – Intersections



SW Johnson Street Evaluation

Table 4 summarizes the comparative qualitative evaluation of the SW Johnson Street alternatives against the project evaluation criteria. Appendix B includes additional details on the comparative evaluation.

Table 4: SW Johnson Street Evaluation

	Safety	Conne	ctivity	Hea Lival	lth/ bility	Coord	ination	Equ	uity
Alignment	Crossings	Destinations	Transit	Parks/ Schools	Adjacent Traffic	Planning Cost	Agency Coordination	Title VI	Disadvantaged
Johnson Street (Alternative A)	Fair	Poor	- Fair	Fair	Poor	Fair	Good	Fair	Fair
Johnson Street (Alternative B)	Fair	Poor	Fair	Good	Poor	Poor	Good	Fair	Fair

Safety

SW Johnson Street (both alternatives) score "fair" for safety due to the second highest number of crossings – the majority being unsignalized. SW Johnson Street has the lowest number of crossings with greater than or equal to 3 lanes.

Connectivity

SW Johnson Street (both alternatives) scored poorly for proximity within essential destinations and transit with one urgent care facility and 16 transit stops located within ¼ mile.

Health/Livability

SW Johnson Street (Alternative B) scored "good" for parks/schools with 9 parks and 7 schools whereas SW Johnson Street (Alternative A) scored "fair" with 7 parks and 4 schools. Both alternatives scored "poor" for adjacent traffic due to ADT exceeding 3,000 throughout most of the corridor(s).

Coordination

SW Johnson Street (both alternatives) scored "good" for coordination with little-to-no cross-agency coordination needs anticipated.

Equity

SW Johnson Street (both alternatives) scored "fair" for equity, with "Alternative B" exhibiting the lowest percentages of 200% poverty (40%) followed by "Alternative A" at 40%. Alternative A has the overall lowest percentage of limited English (11%) compared to the other trail alignment alternatives.

SW Johnson Street Recommendations

Based on the multimodal analysis, guidance for regional trail design, guidance for enhanced crossing facilities, conceptual trail cross sections and conceptual trail enhanced crossings, a combination of the following cross sections and enhanced crossing facilities are recommended. The recommendations are preliminary, subject to input from the TAC, SAC, and public and may be refined further once a corridor alignment is selected.

The **60-foot cross section** with a regional trail provided on the **north side** of the roadway is recommended, as illustrated in Figure 14. At approaches to signalized intersections (Cornelius Pass Road, SW 198th Avenue and SW 185th Avenue), the 60-foot cross section with a left-turn lane is recommended. The regional trail is recommended to run on the **north side** of the roadway due to less driveways, more available ROW, and the less impacts to adjacent property owners.

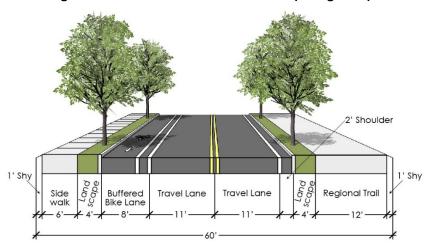


Figure 14: Recommended Cross Section (facing west)

Opportunities to preserve on-street parking exist throughout the corridor. In locations with heavily utilized on-street parking, the 60-foot cross section with a parking protected bike lane opposite the regional trail facility is recommended, as illustrated in Figure 15.

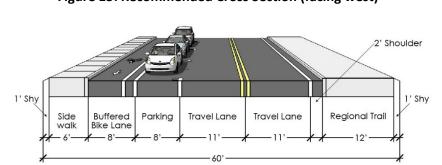


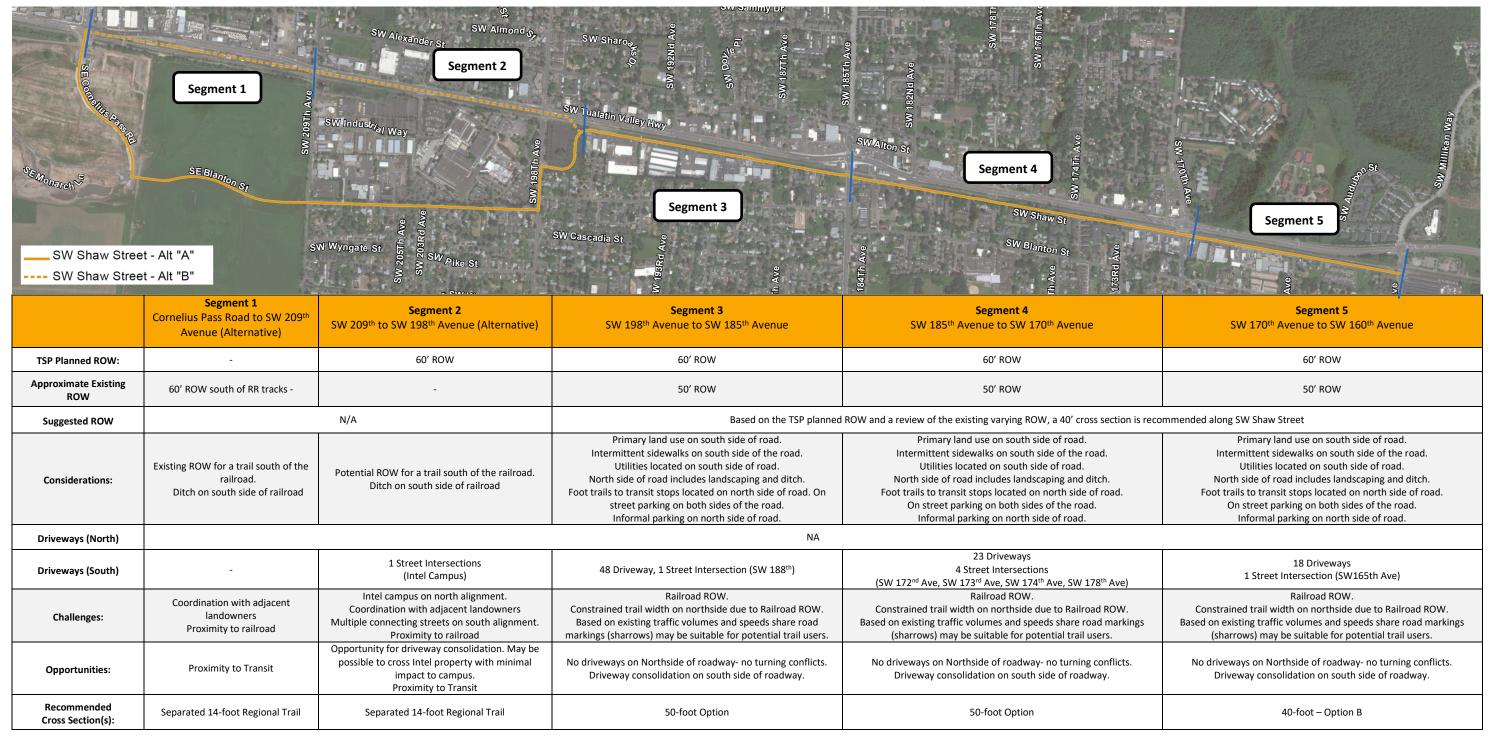
Figure 15: Recommended Cross Section (facing west)

Based on a qualitative assessment of crossing opportunities, a RRFB is recommended at the intersection of SW Johnson Street/SW 170th Avenue under Alternative A. At all signalized intersection crossings, further evaluation is recommended to determine the operational impacts of leading pedestrian interval (LPI) phasing to provide an advance crossing phase for people walking and biking.

SW SHAW STREET

The following section summarizes the considerations, challenges, and opportunities for implementing the TV Trail concept along SW Shaw Street. Figure 16 summarizes the key segment considerations including cross section alternatives while Figure 17 summarizes key crossing considerations including level of separation and enhanced facility types.

Figure 16: SW Shaw Street – Segments



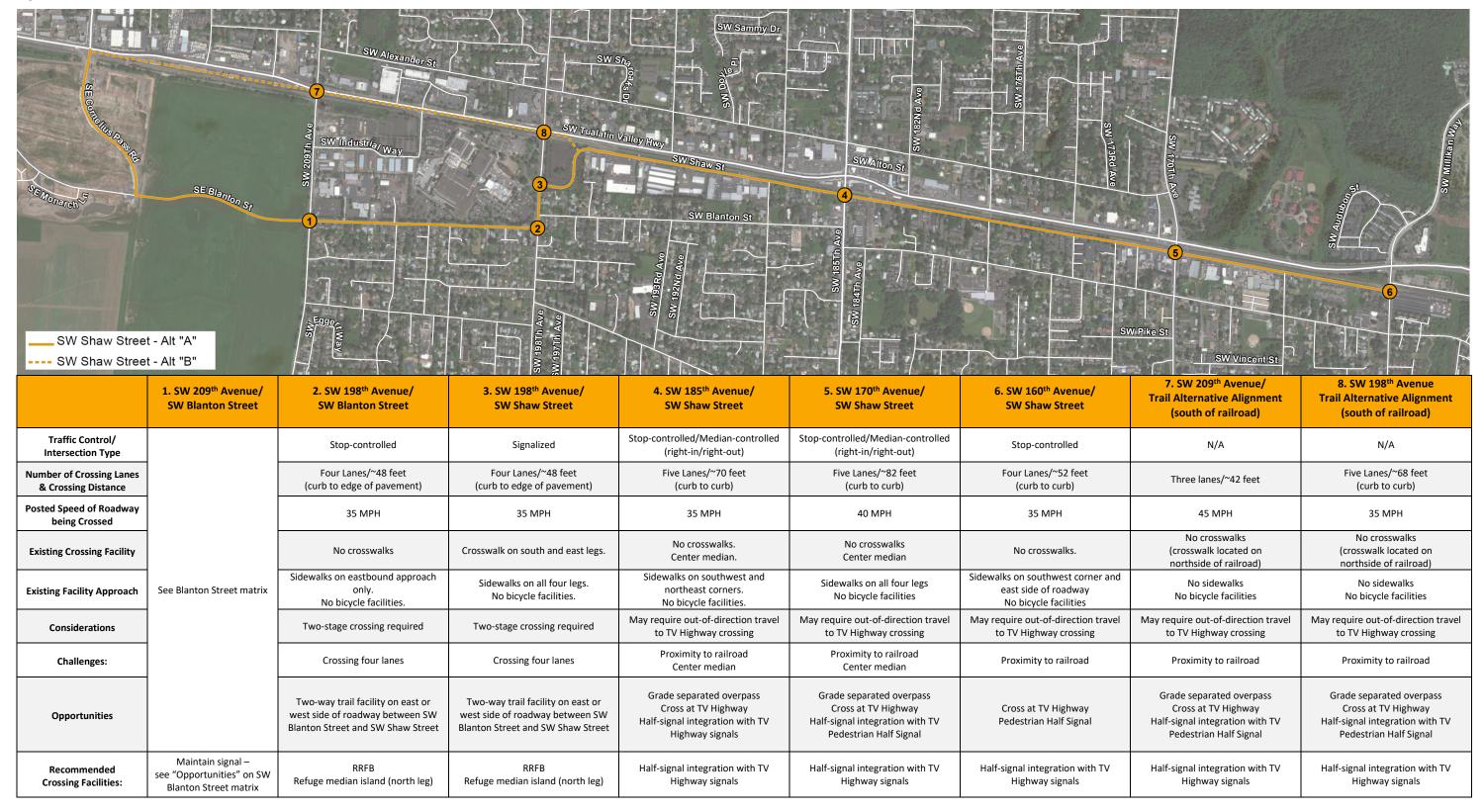
Note: Segment 1 and Segment 2 SE Blanton Street alignment covered on following page

Note: Separated 14-foot regional trail envisioned as stand along trail. 50-foot includes a 12-foot regional trail on one side. 40-foot – Option B includes a 14-foot regional trail on one side.

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Figure 17: SW Shaw Street – Intersections



SW Shaw Street Evaluation

Table 5 summarizes the comparative qualitative evaluation of the SW Shaw Street alternatives against the project evaluation criteria. Appendix B includes additional details on the comparative evaluation.

Table 5: SW Shaw Street Evaluation

	Safety	Conne	ctivity		ilth/ bility	Coord	ination	Equ	uity
Alignment	Crossings	Destinations	Transit	Parks/ Schools	Adjacent Traffic	Planning Cost	Agency Coordination	Title VI	Disadvantaged
SW Shaw Street (Alternative A)	Fair	Fair	Good	Fair	Good	- Fair	Poor	Good	Good
SW Shaw Street (Alternative B)	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good

Safety

The SW Shaw Street alternatives have the lowest number of crossings; however, the majority require crossings of greater than or equal to 3 lanes, resulting in a "fair" score for safety. Walking out of direction to TV Highway to cross at the signalized intersections is an option.

Connectivity

SW Shaw Street (Alternative B) scores "good" for destinations with at least one large employer, urgent acre, community center and two grocery stores located whereas SW Shaw Street (Alternative A) scores "fair with one less grocery store within proximity.

Health/Livability

SW Shaw Street (Alternative B) scores "good" for parks/schools with 7 schools and 7 parks whereas SW Shaw Street (Alternative A) scores "fair" with 6 schools and 6 parks. Both alternatives score "good" for adjacent traffic with relatively low ADT.

Coordination

SW Shaw Street (both alternatives) score "fair" for planning cost, and "poor" for agency coordination. This is primarily due to the anticipated coordination needs associated with the railroad.

Equity

SW Shaw Street (both alternatives) score "good" for equity with Alternative B having the highest percentage for 200% poverty (22%), people of color (52%), and youth (17%). SW Shaw Street (Alternative A) is tied for having the highest percentage for living with a disability (11%).

SW Shaw Street Recommendations

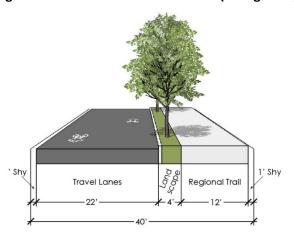
Based on the multimodal analysis, guidance for regional trail design, guidance for enhanced crossing facilities, conceptual trail cross sections and conceptual trail enhanced crossings, a combination of the following cross sections and enhanced crossing facilities are recommended. The recommendations are preliminary, subject to input from the TAC, SAC, and public and may be refined further once a corridor alignment is selected.

The **50-foot cross section** with a regional trail provided on the **north side** of the roadway is recommended, as illustrated in Figures 18 and 19. The regional trail is recommended to run on the **north side** of the roadway due to the limited potential conflict points (no driveways). Where ROW is constrained, primarily along the segment approaching SW 160th Avenue, the 40-foot cross section is recommended to reduce potential impacts to adjacent properties on the south side of the roadway, as illustrated in Figure 19. Both cross section recommendations avoid the 30-foot railroad offset.

Figure 18: Preferred Cross Section (facing west)

1' Shy Side & Regional Trail 1' Shy walk 6' 4' 22' 4' 12'

Figure 19: Constrained Cross Section (facing west)



Based on a qualitative assessment of crossing needs, half signals are recommended at the intersections within proximity (SW 160th Avenue, SW 170th Avenue, SW 185th Avenue, SW 198th Avenue, and SW 209th Avenue) to TV Highway to allow for potential signal integration and coordination².

Under Alternative B, RRFBs are recommended along SW 198th Avenue to cross trail users from SW Shaw Street onto SW Blanton Street. Opportunities to install pedestrian refuge islands should be further explored if this alternative is selected as the preferred alignment.

Kittelson & Associates, Inc. Portland, Oregon

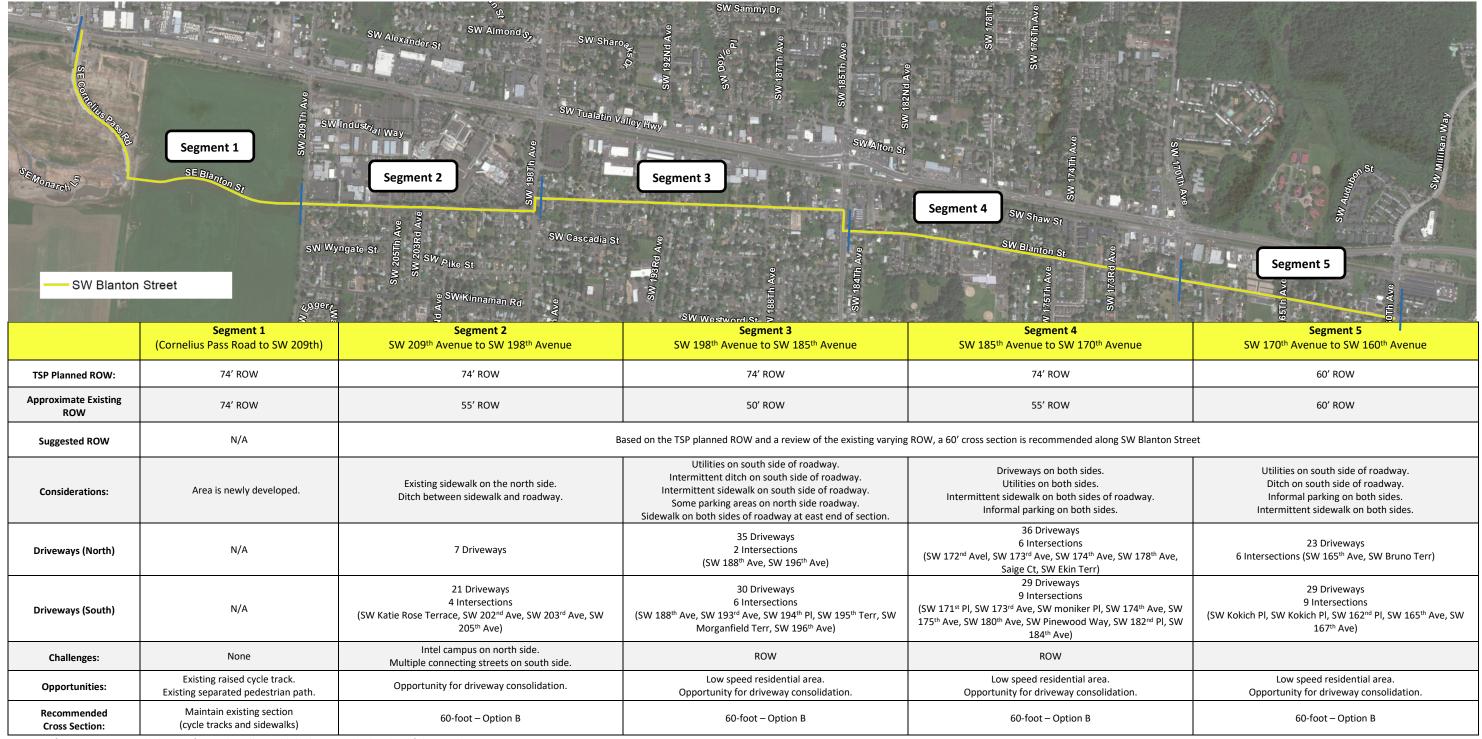
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²This treatment was implemented at a MAX lightrail crosing but may not be approved by ODOT Rail or the railroad for a heavy rail crossing.

SW BLANTON STREET

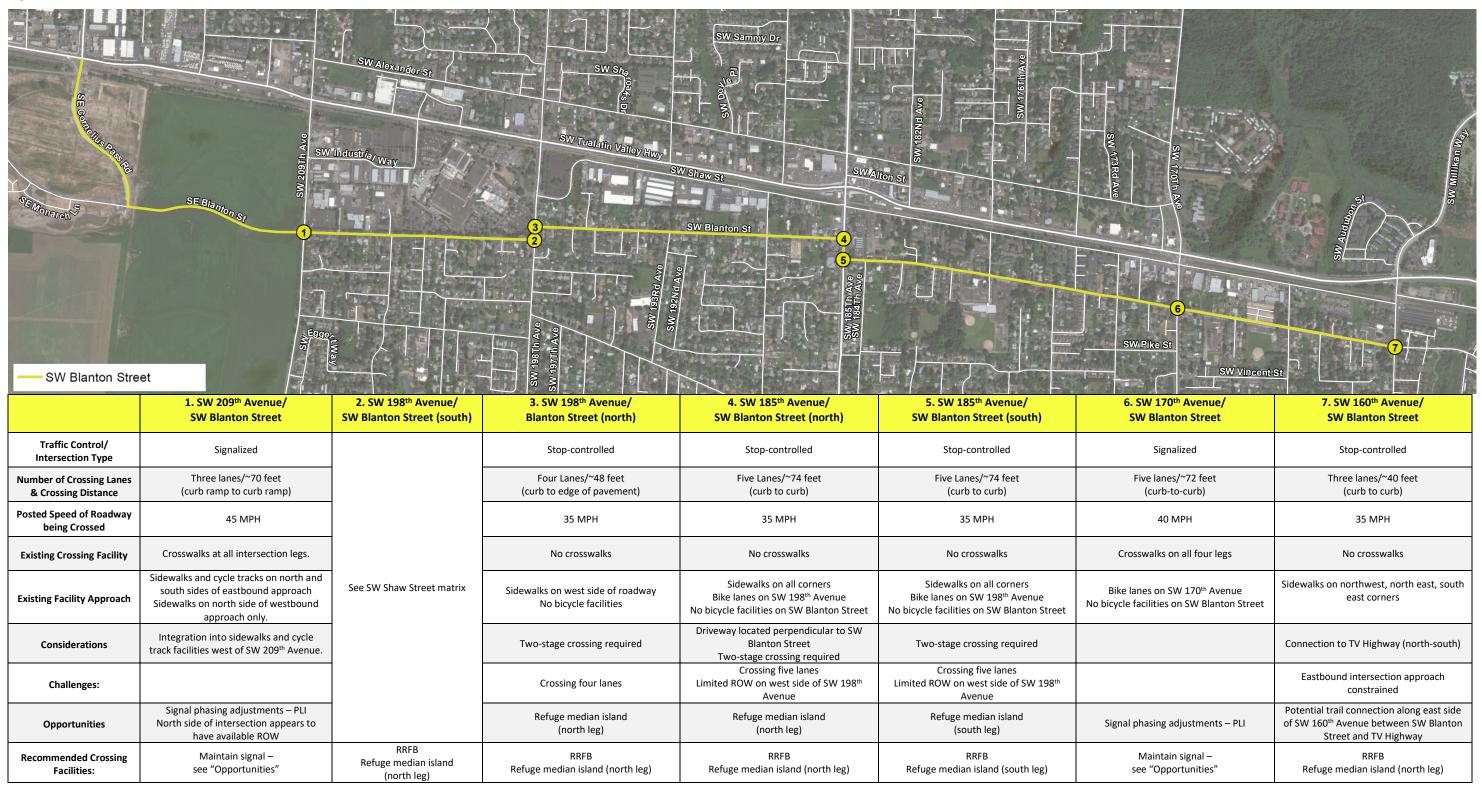
The following section summarizes the considerations, challenges, and opportunities for implementing the TV Trail concept along SW Blanton Street. Figure 20 summarizes the key segment considerations including cross section alternatives while Figure 21 summarizes key crossing considerations including level of separation and enhanced facility types.

Figure 20: SW Blanton Street - Segments



Note: 60-foot – Option B includes a 6-foot sidewalks and bike lanes on both sides of the roadway.

Figure 21: SW Blanton Street – Intersections



SW Blanton Street Evaluation

Table 6 summarizes the qualitative evaluation of SW Blanton Street against the project evaluation criteria. Appendix B includes additional details on the comparative evaluation.

Table 6: SW Blanton Street Evaluation

	Safety	Connectivity			olth/ bility	Coord	ination	Equity		
Alignment	Crossings	Destinations	Transit	Parks/ Schools	Adjacent Traffic	Planning Cost	Agency Coordination	Title VI	Disadvantaged	
SW Blanton Street	Poor	Fair	Good	Fair	Poor	Poor	Good	Good	Good	

Safety

SW Blanton Street has the highest number of crossings and the greatest number of crossings with greater than or equal to 3 lanes, resulting in a "poor" score for safety.

Connectivity

SW Blanton Street scores "fair" for destinations with at least one large employer, grocery store, urgent acre, and community center located within ¼ mile proximity. SW Blanton Street scores "good" for having 37 transit stops within ¼ mile proximity.

Health/Livability

SW Blanton Street scores "fair" for parks/schools with 4 parks and 6 schools within ¼ mile proximity. SW Blanton Street scores "poor" for adjacent traffic with the highest ADT exhibited across the alignment alternatives.

Coordination

SW Blanton Street scores "poor" for planning cost primarily due to the potential impacts to adjacent properties. SW Blanton Street scores "good" for agency coordination with little-to-no cross-agency coordination requirements anticipated.

Equity

SW Shaw Street scores "good" for Title VI and Disadvantaged with the highest percentage of limited English (16%) and tied for highest percentage of seniors 65+ (9%).

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SW Blanton Street Recommendations

Based on the multimodal analysis, guidance for regional trail design, guidance for enhanced crossing facilities, conceptual trail cross sections and conceptual trail enhanced crossings, the following is alternative is recommended for SW Blanton Street. The recommendations are preliminary, subject to input from the TAC, SAC, and public and may be refined further once a corridor alignment is selected.

The **60-foot cross section** with a **separated bike lanes and sidewalks on both sides** of the roadway is recommended along SW Blanton Street, as illustrated in Figure 22.

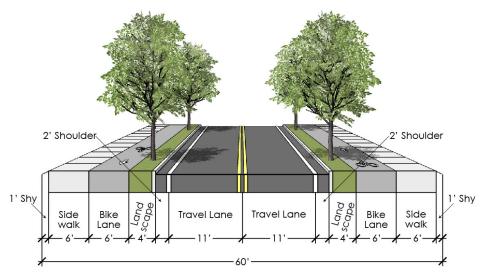


Figure 22: Recommended Cross Section

Based on a qualitative assessment of crossing needs, half signals or HAWKs are recommended at the crossings of SW 198th Avenue and SW 185th Avenue coupled with pedestrian refuge islands.

At the existing signalized crossings of SW 209th Avenue and SW 170th Avenue, further evaluation is recommended to determine the operational impacts of a leading pedestrian interval (LPI) to provide an advance crossing phase for people walking and biking.

CONCEPTUAL TRAIL RECOMMENDATIONS

Table 7 illustrates the comparison of each trail alignment as summarized in the previous sections.

Table 7: Trail Alignment Comparison

	Safety	Conne	ectivity		olth/ bility	Coord	ination	Equity			
Alignment	Crossings	Destinations	Transit	Parks/ Schools	Adjacent Traffic	Planning Cost	Agency Coordination	Title VI	Disadvantaged		
Johnson Street (Alternative A)	Fair	Poor	Fair	Fair	Poor	Fair	Good	Fair	Fair		
Johnson Street (Alternative B)	Fair	Poor	Fair	Good	Poor	Poor	Good	Fair	Fair		
SW Shaw Street (Alternative A)	Fair	Fair	Good	Fair	Good	Fair	Poor	Good	Good		
SW Shaw Street (Alternative B)	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good		
SW Blanton Street	Poor	Fair	Good	Fair	Poor	Poor	Good	Good	Good		

Based on the trail alternatives analysis and evaluation criteria, the alignment alternative that most closely aligns with the project vision, goals, and objectives is SW Shaw Street. Under this alignment, the 50-foot cross section is recommended and where constrained, the 40-foot cross section — option B is recommended.

SW Shaw Street "Alternative B" scores stronger compared to "Alternative A" when compared to the project evaluation criteria; however, further evaluation to determine the feasibility of constructing the trail parallel to TV Highway west of SW 198th Avenue must be evaluated as it relates to the proximity of the railroad and adjacent properties.

A key component to the feasibility of the SW Shaw Street alignment is determine the potential impacts and feasibility of providing enhanced crossings (half signals) at the crossings within proximity of the TV Highway signals. If a coordinated signal system does not appear feasible to provide trail users with a protected crossing phase at SW Shaw Street, the SW Shaw Street alternatives may not be suitable for a regional trail facility due to the need to use the signalized pedestrian crossings at TV Highway. Using the crossings at the TV Highway intersections requires crossing the railroad tracks two times at each roadway crossing resulting in an inconvenient and uncomfortable experience for users.

If alternative crossing treatments other than using the TV Highway signals are not feasible for the SW Shaw Street alignment, then the SW Blanton Street alignment would be preferred or a combination of SW Shaw Street and SW Blanton Street.

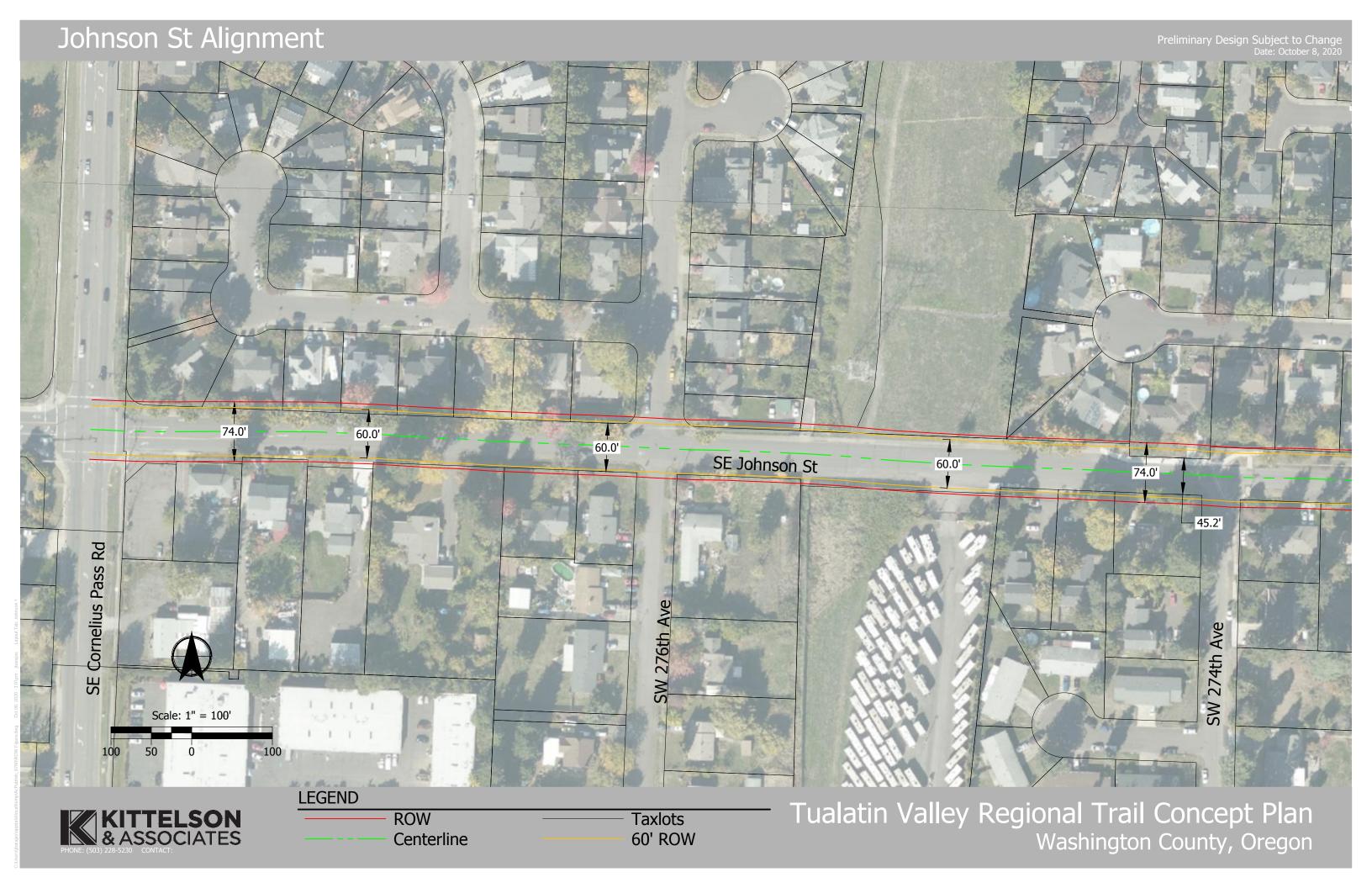
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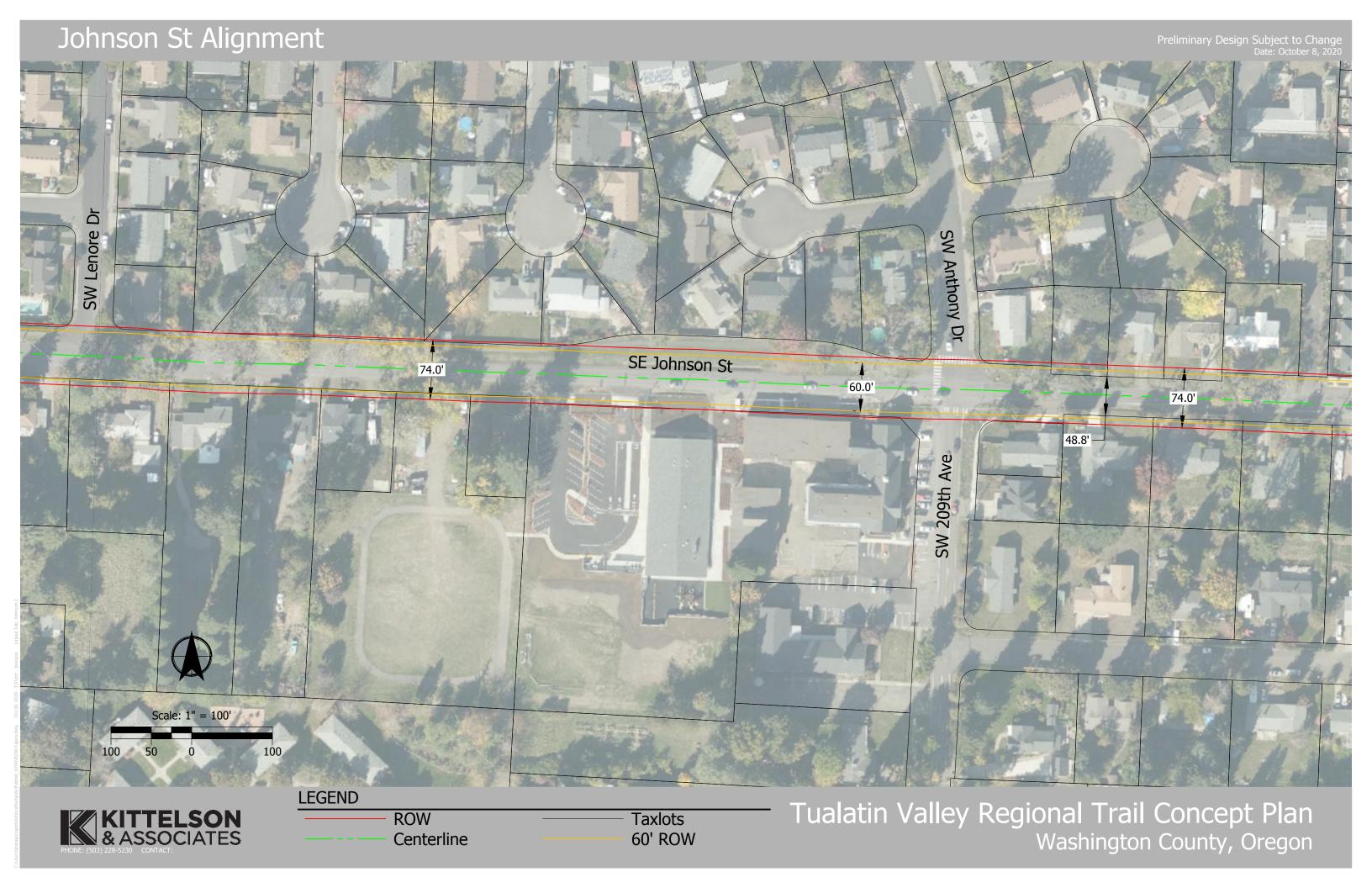
The cross-section alternatives and intersection treatments for each corridor alignment will be reviewed with the TAC and SAC and the public will be invited to weigh in on each of the cross-sections and corridors. Based on their input as well as the evaluation of each corridor against the project goals and evaluation criteria, one of the three corridors will be selected as the preferred alignment. The cross-section and crossing treatments will then be further refined and a conceptual design will be prepared for the corridor for further input from the TAC, SAC, and public.

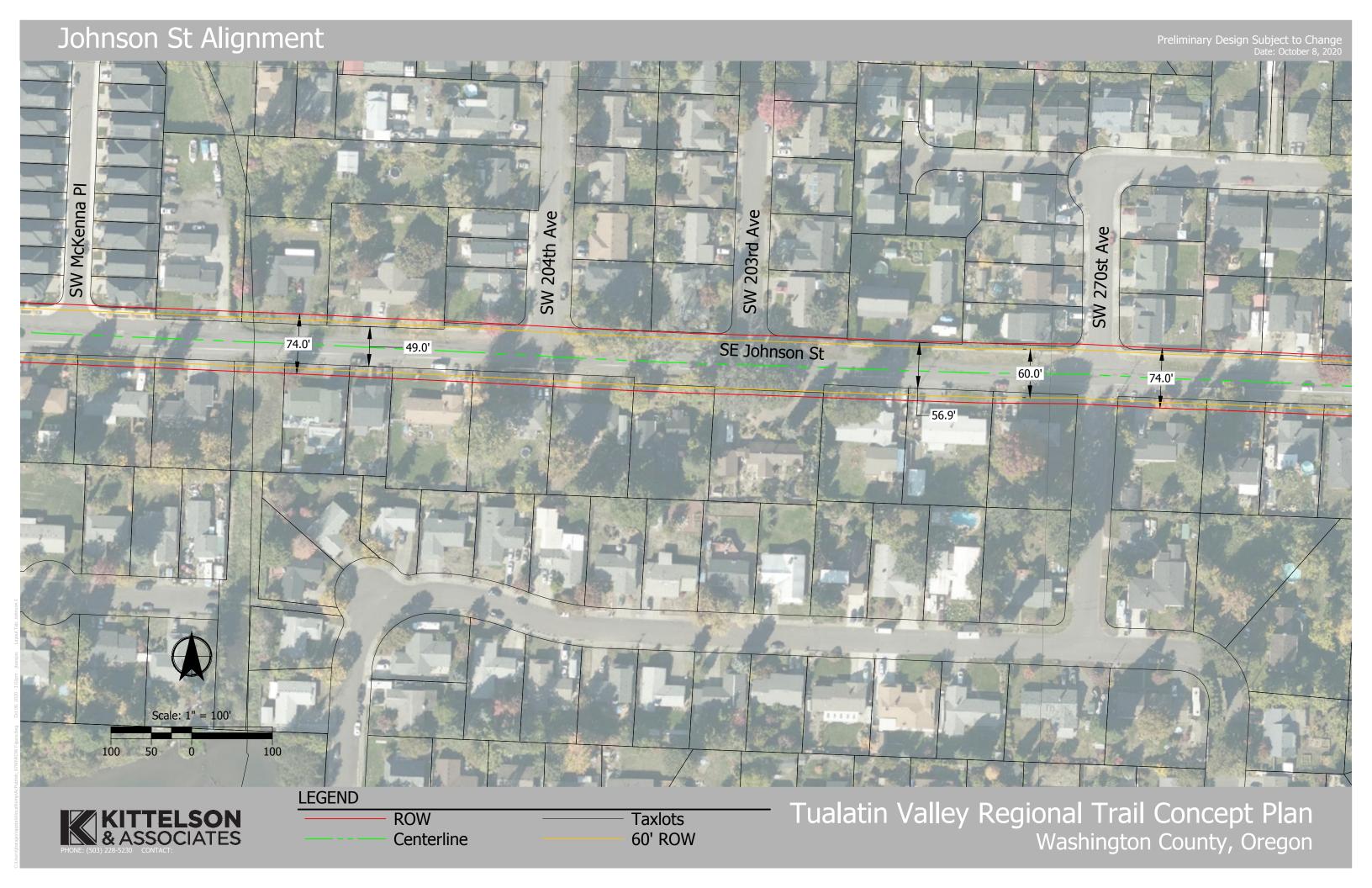
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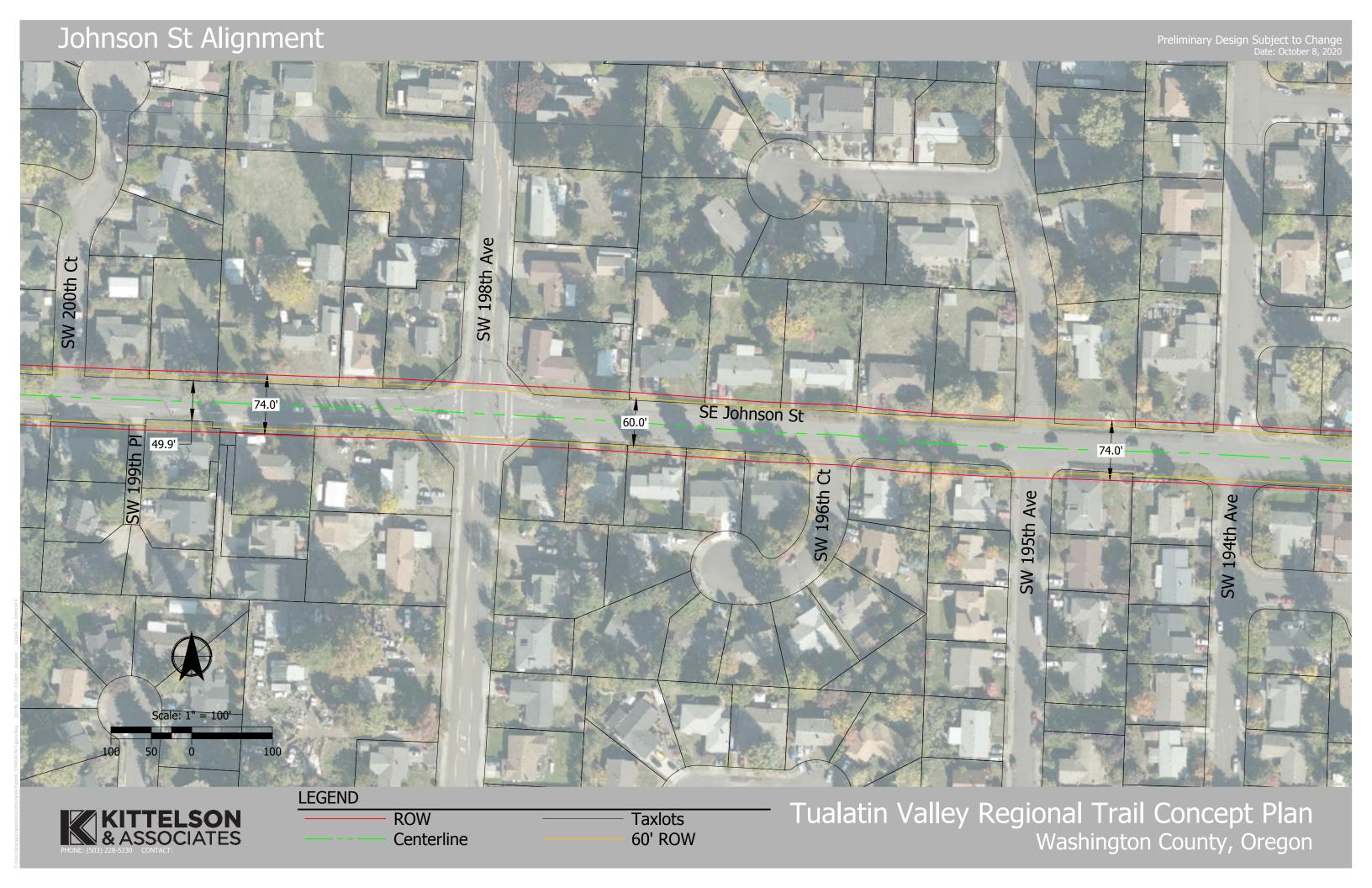
- 1. Existing and Future Conditions Memorandum
- 2. Project Need, Goals, Objectives, and Evaluation Criteria Memorandum
- 3. Metro's Design Livable Streets and Trails Guide
- 4. The Federal Highway Administration *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations*





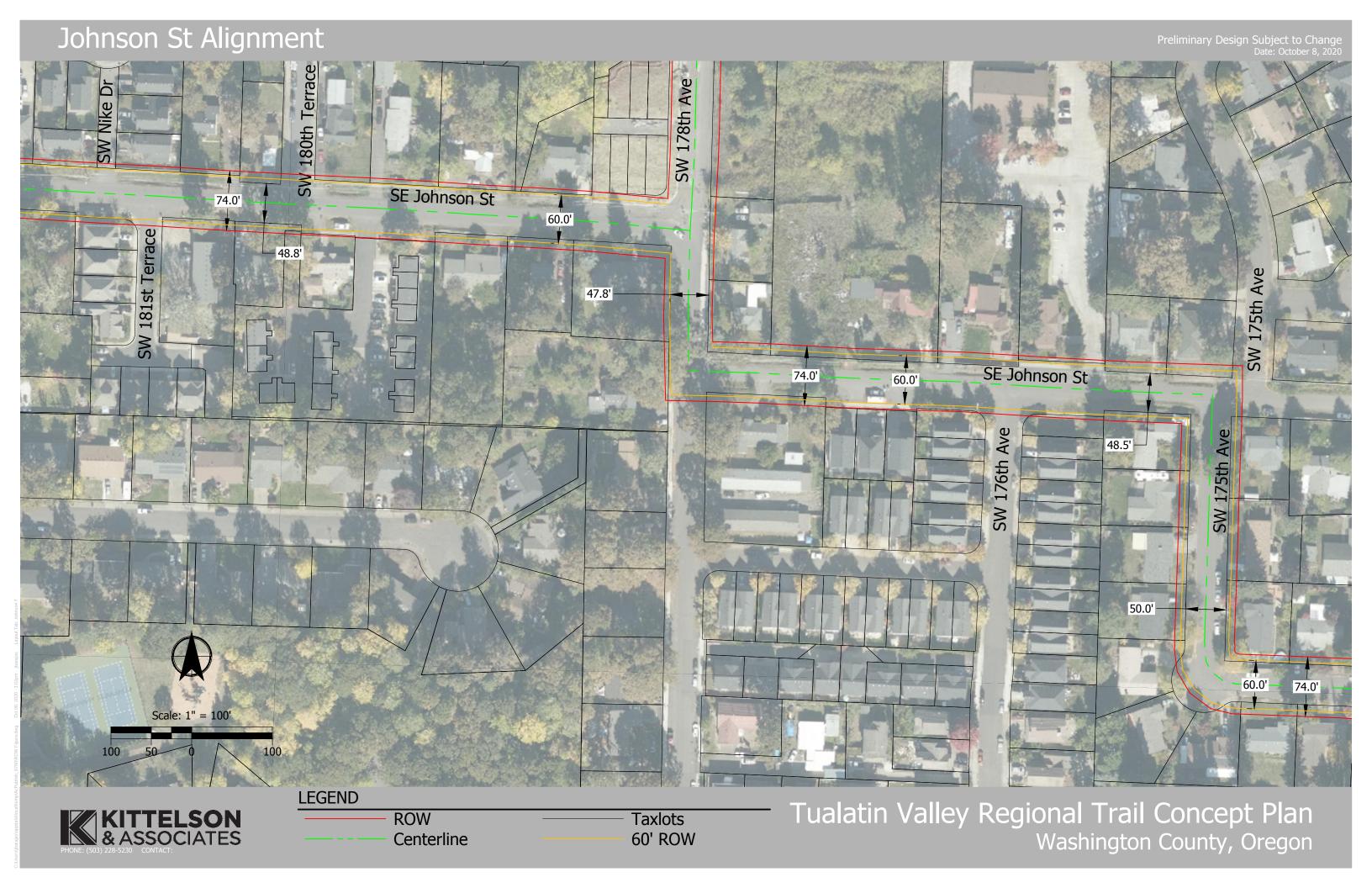


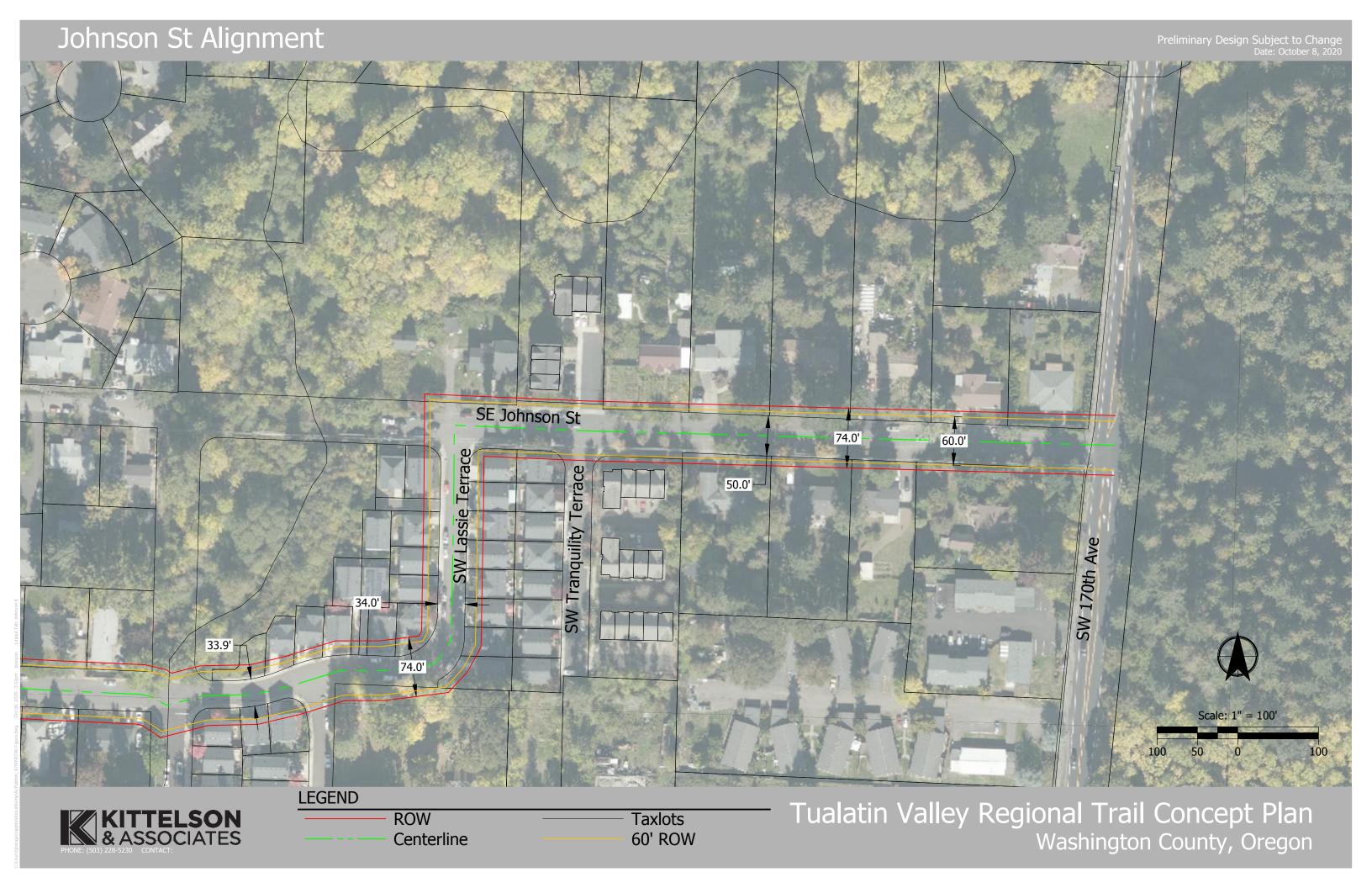


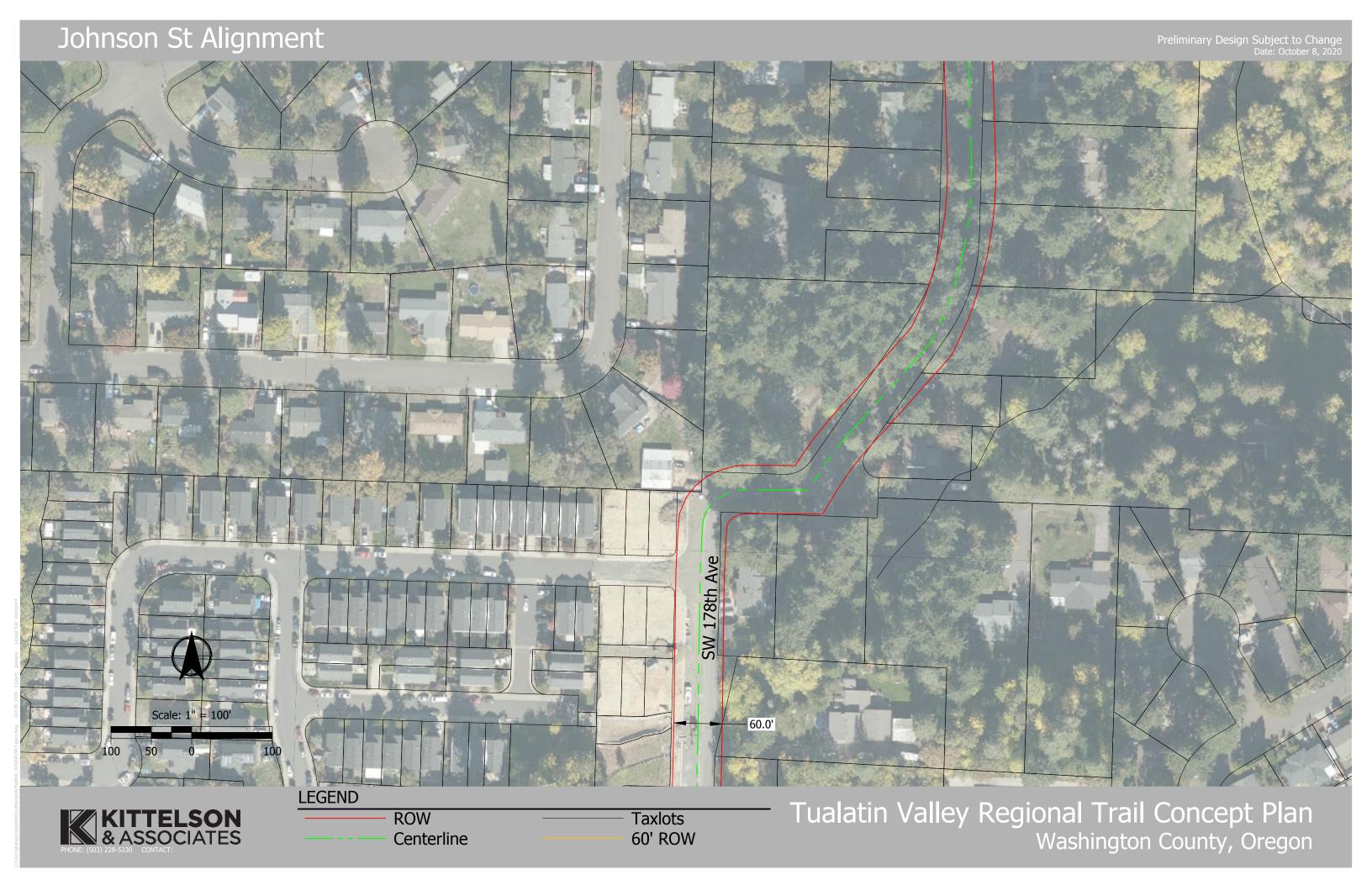


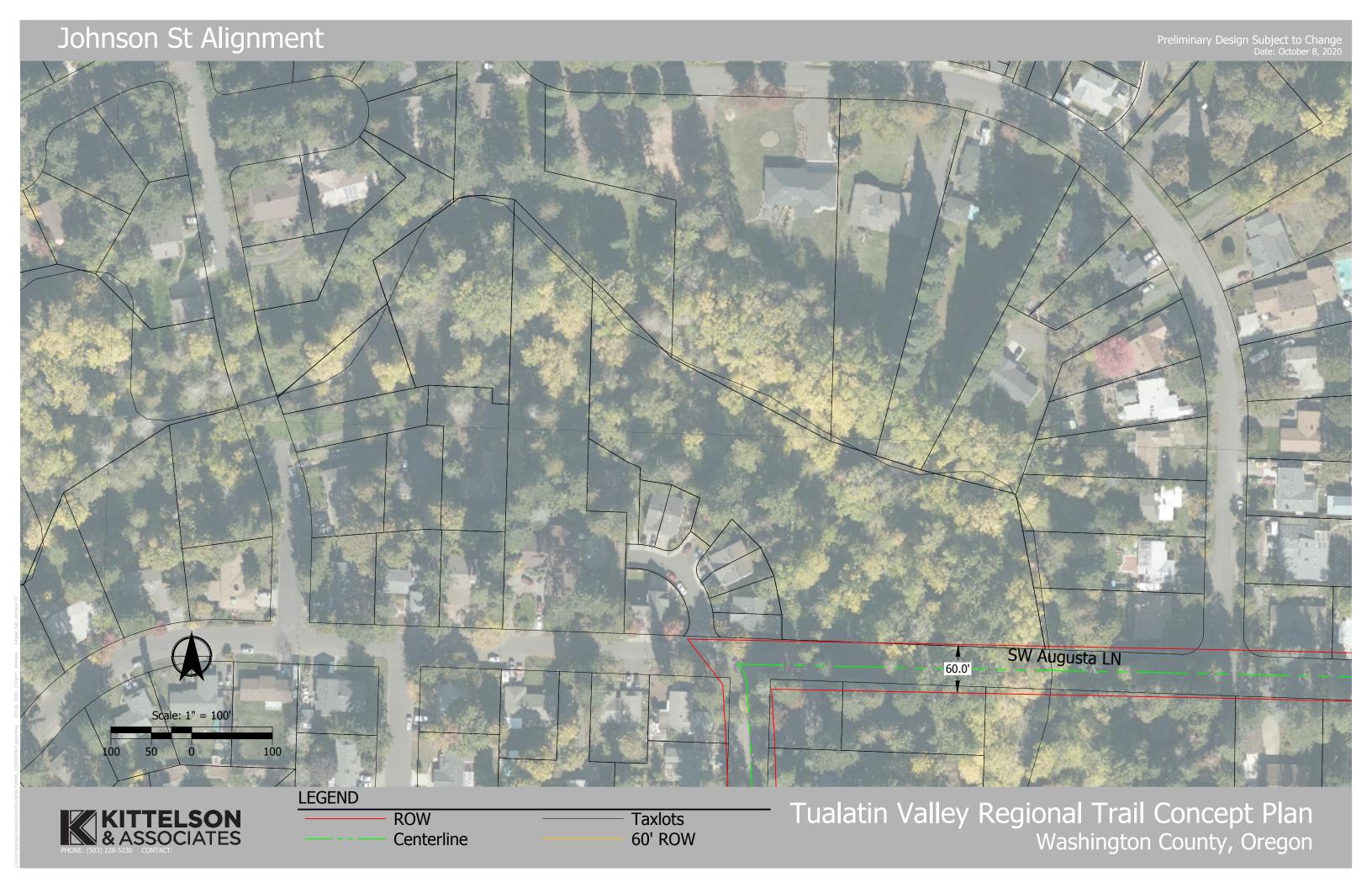


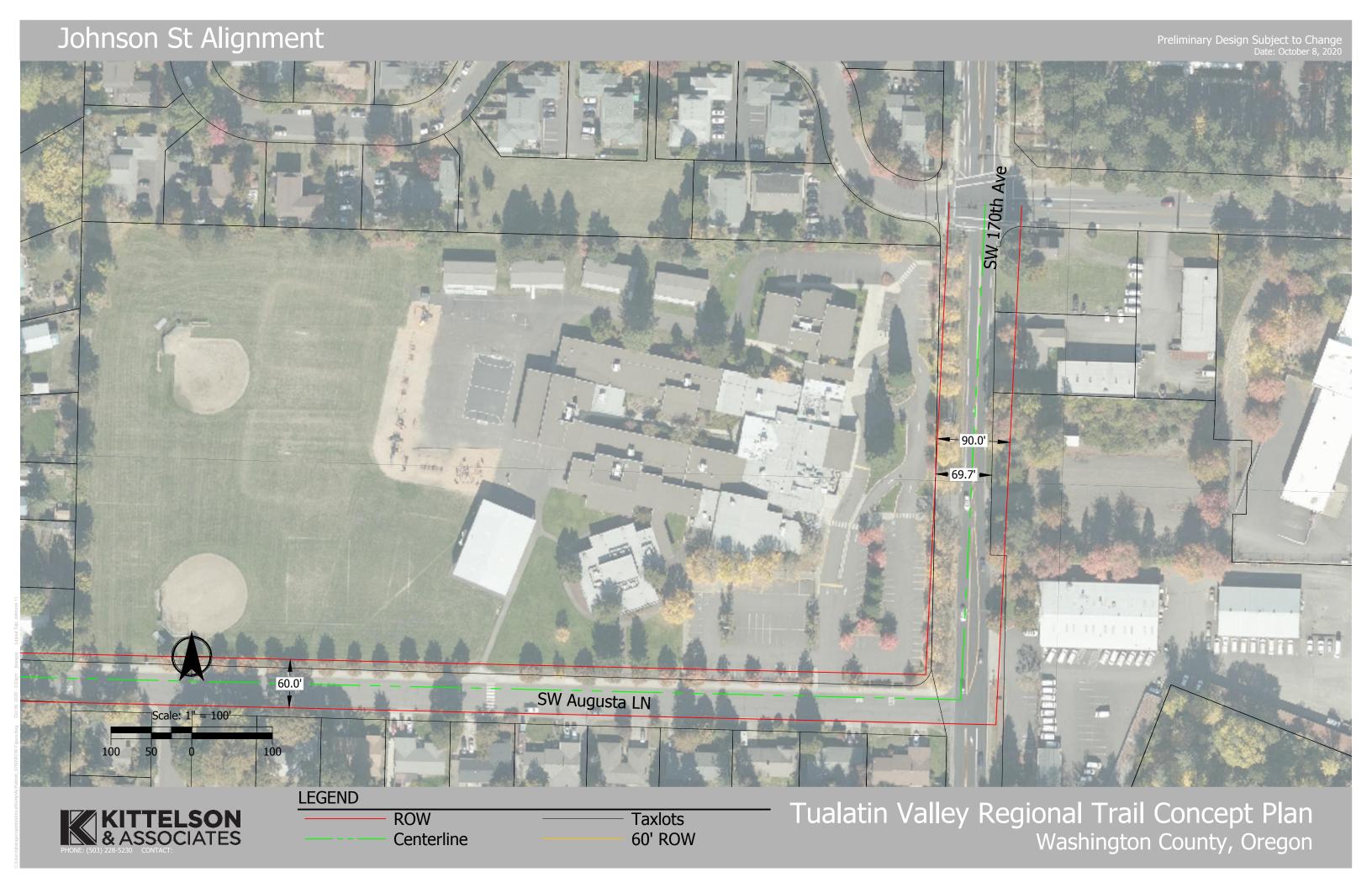


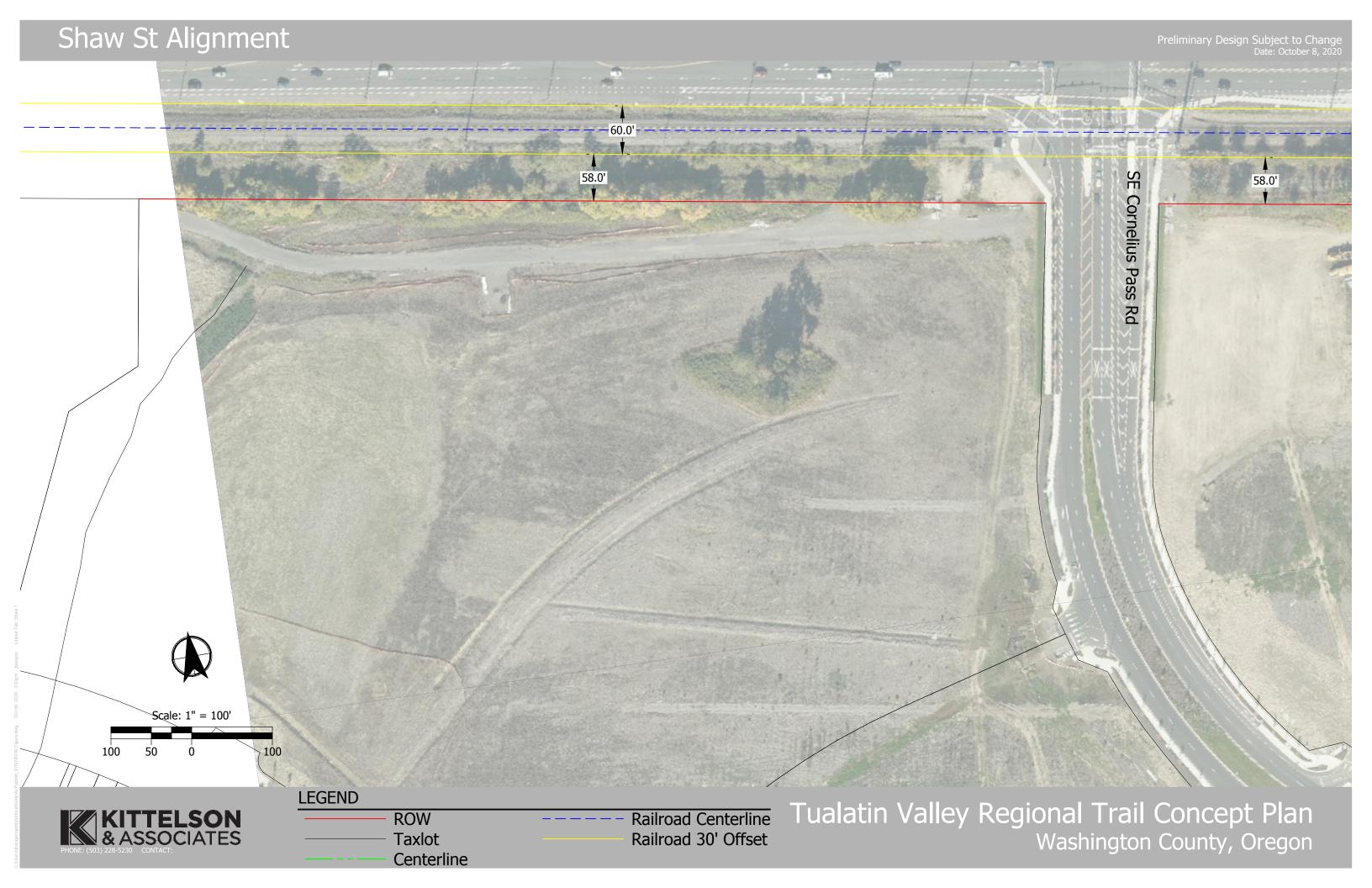


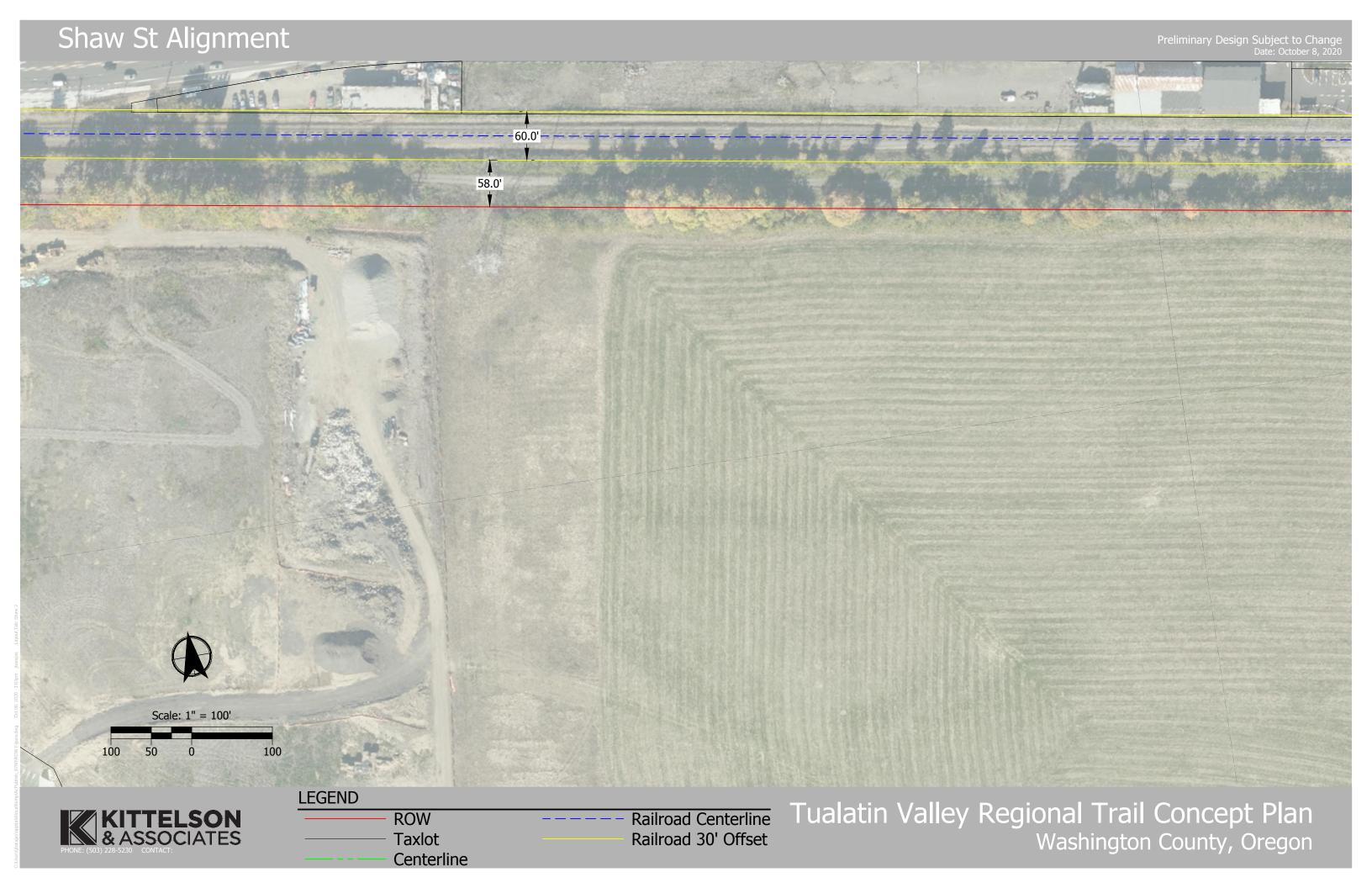


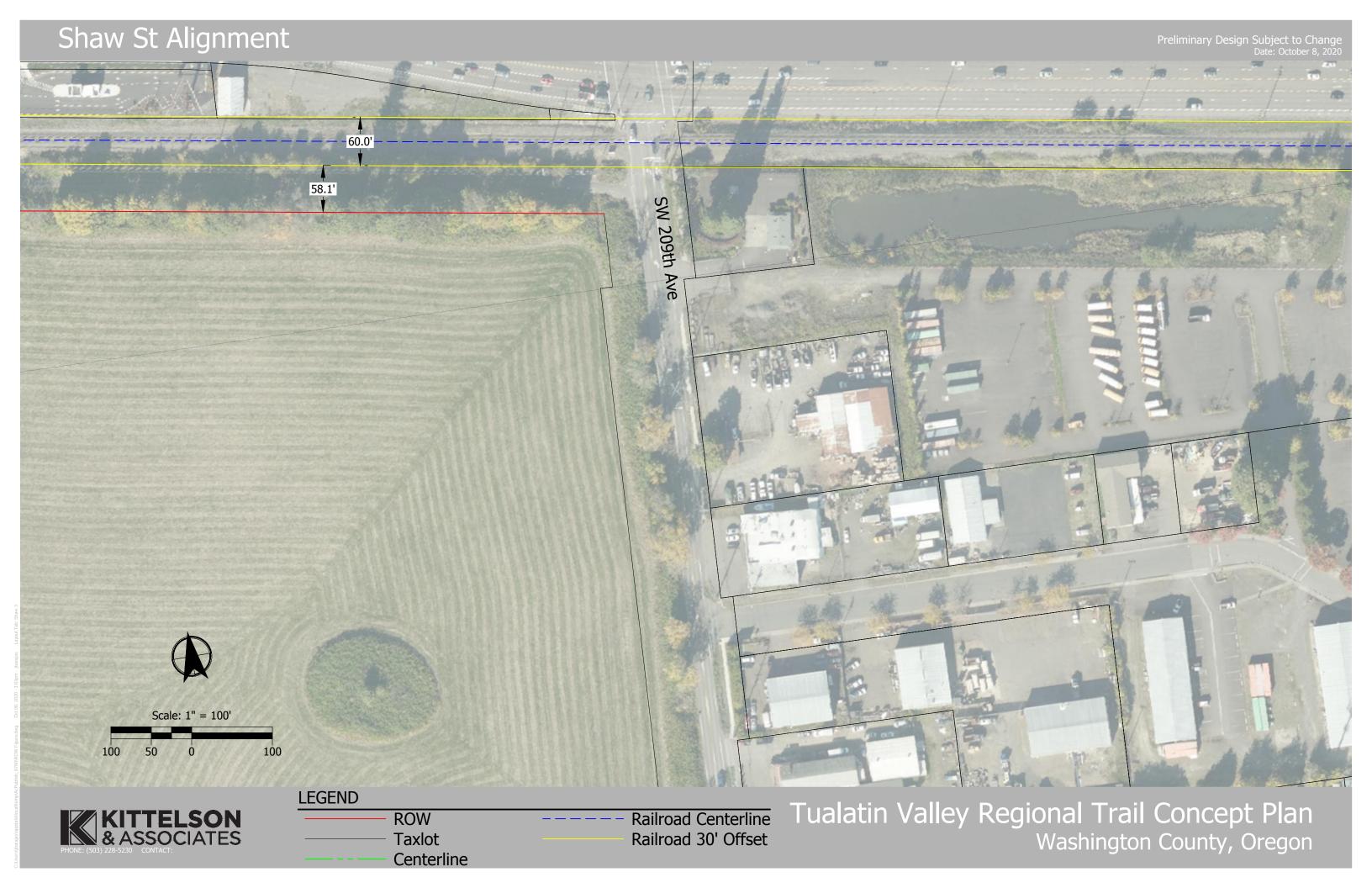


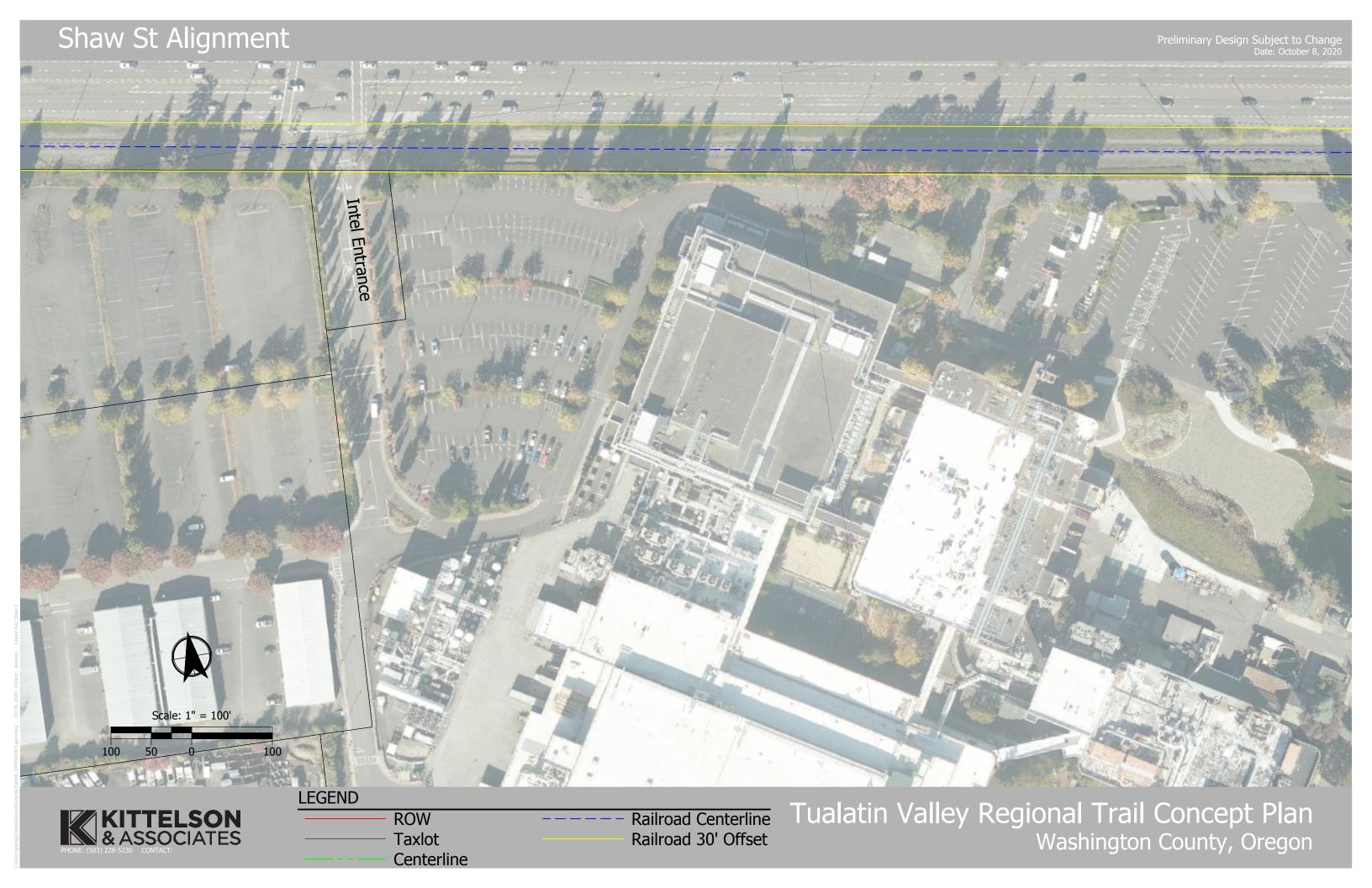


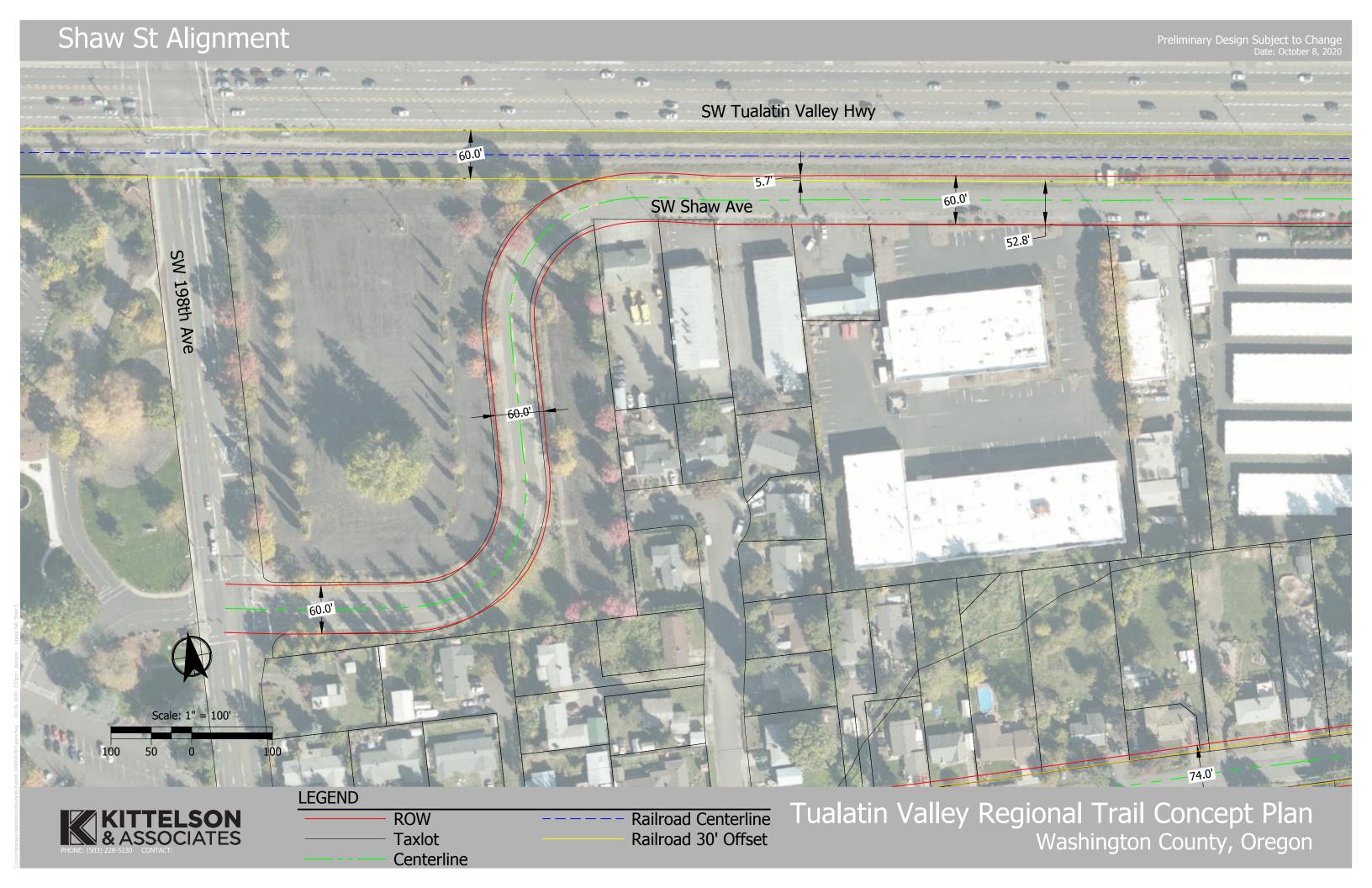


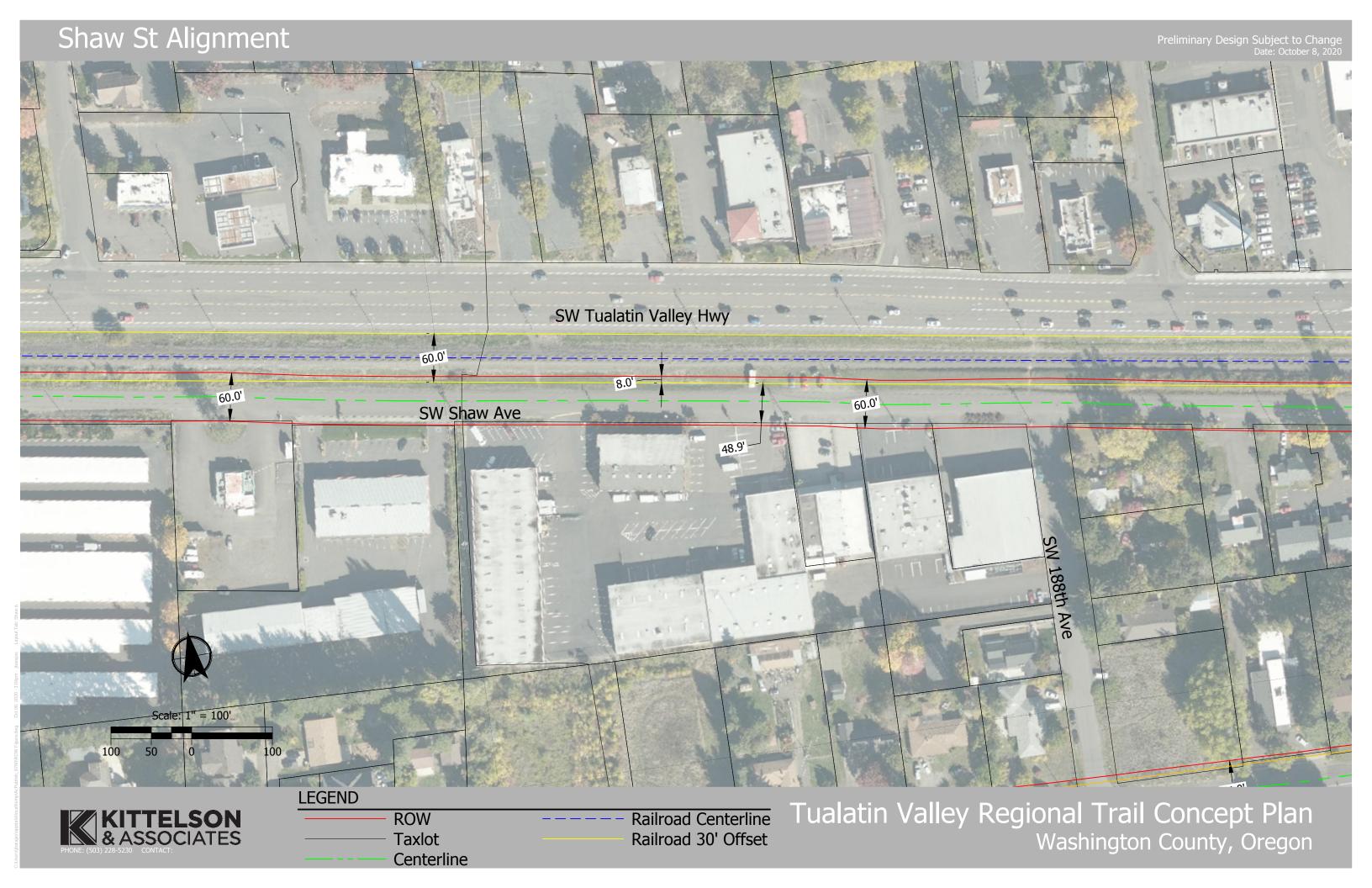


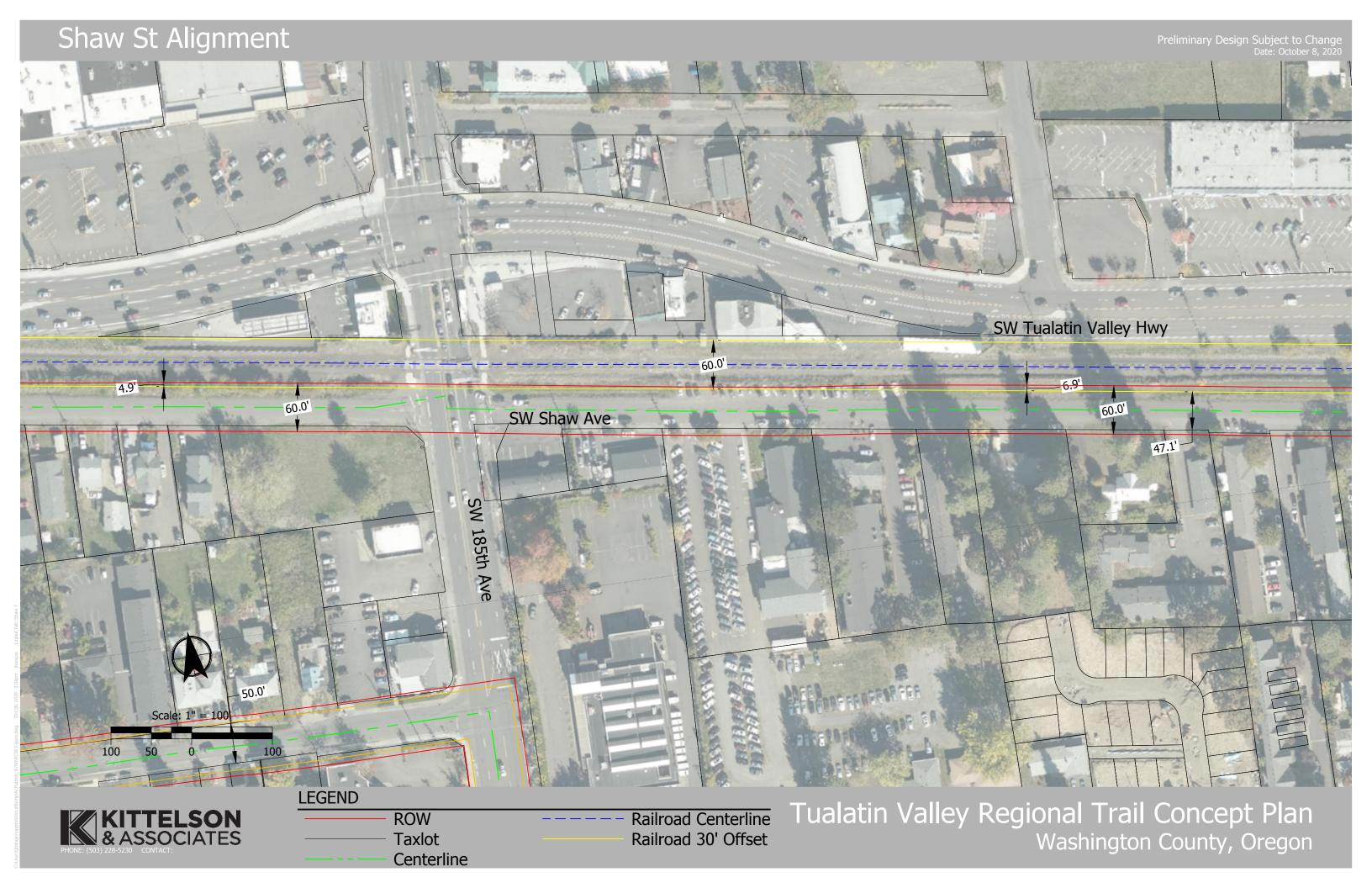


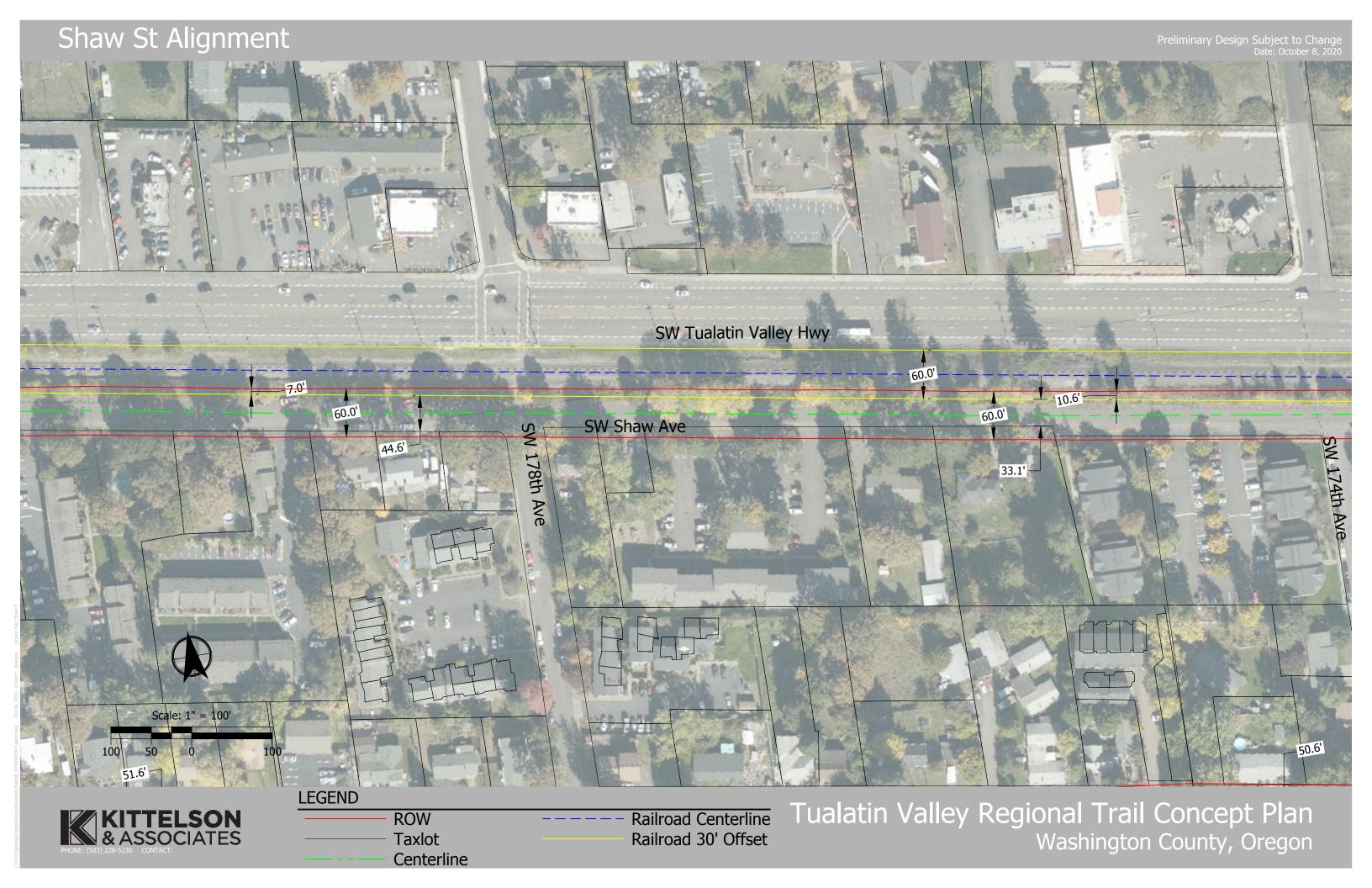


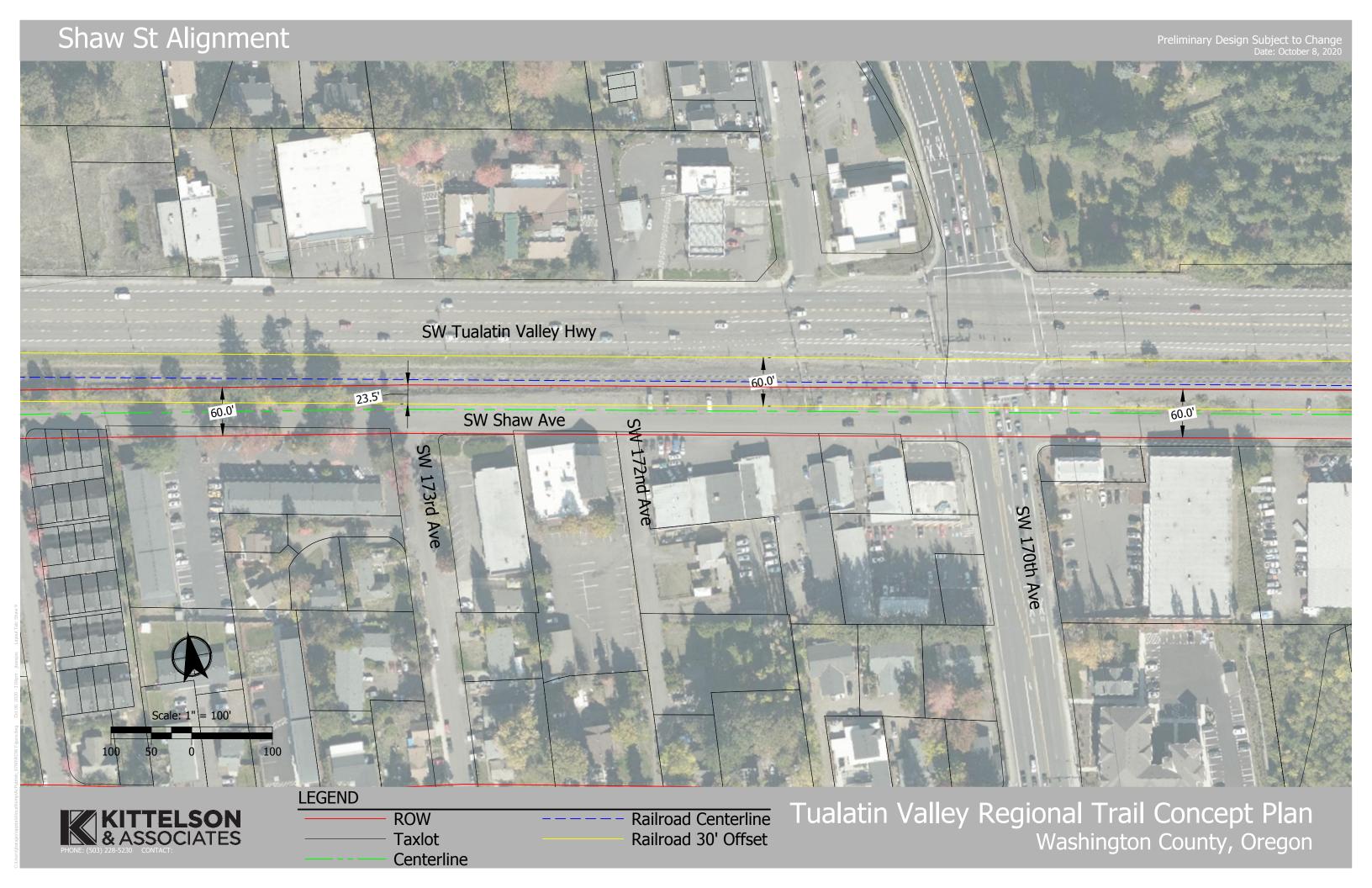


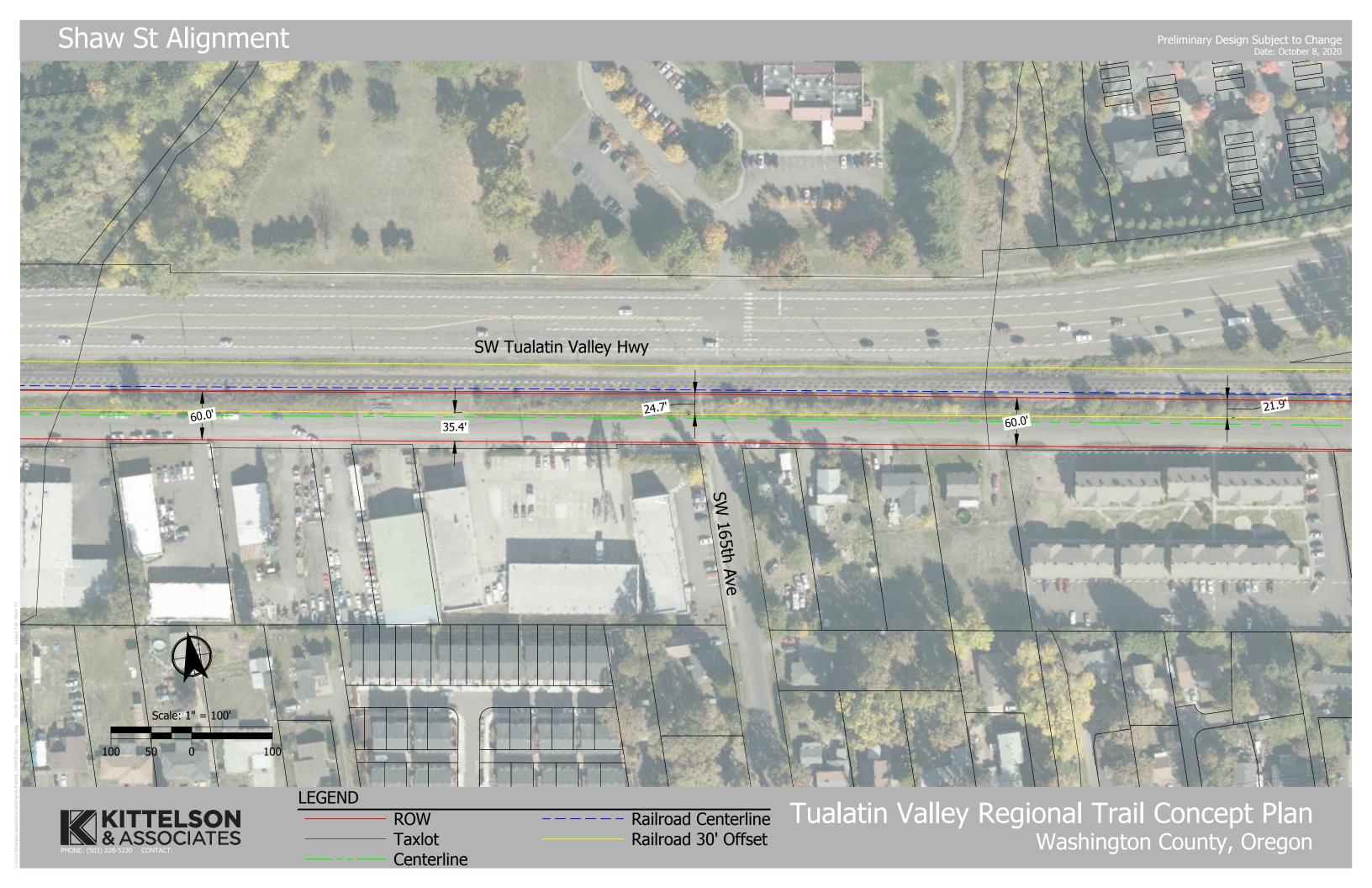


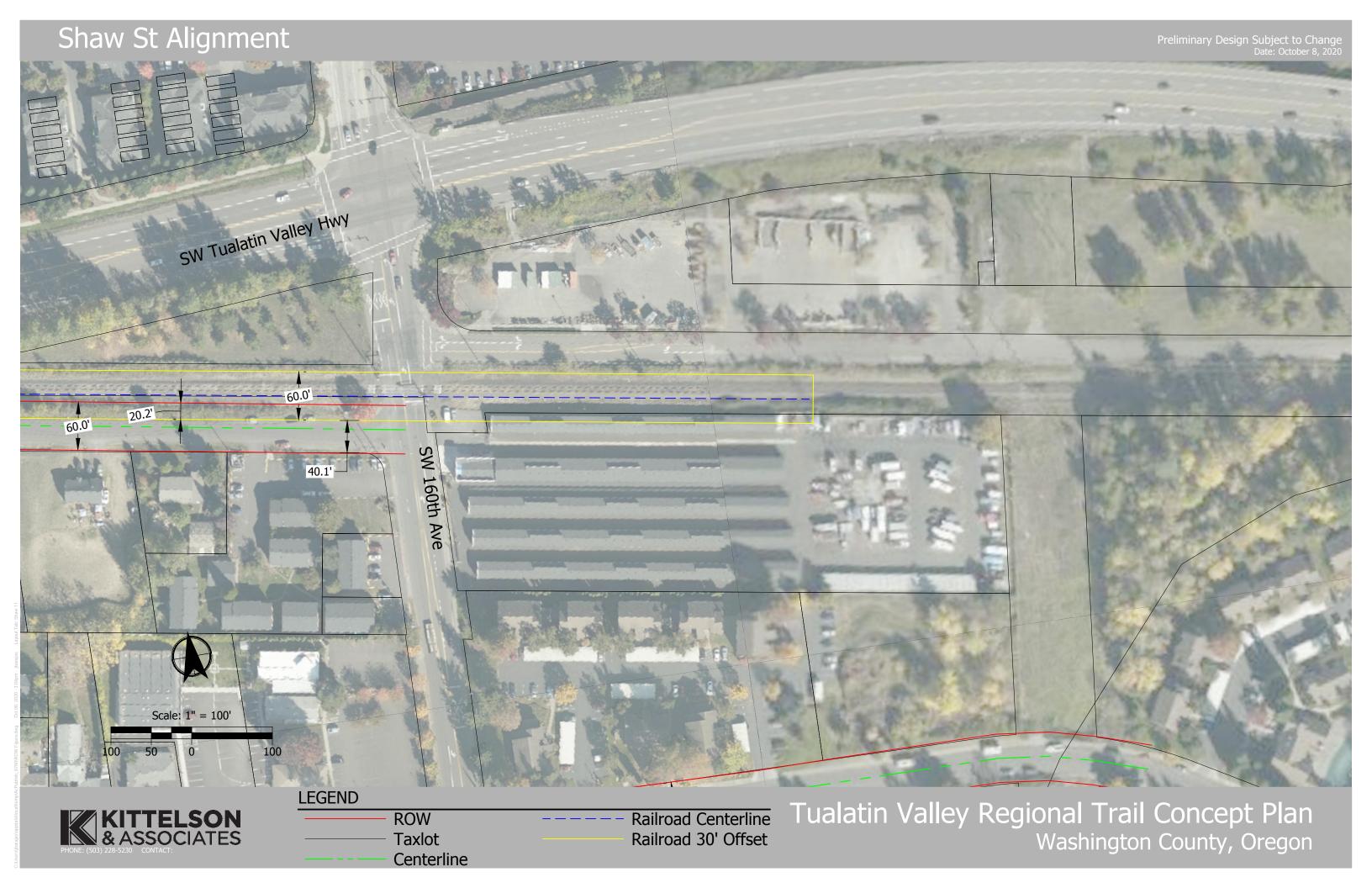


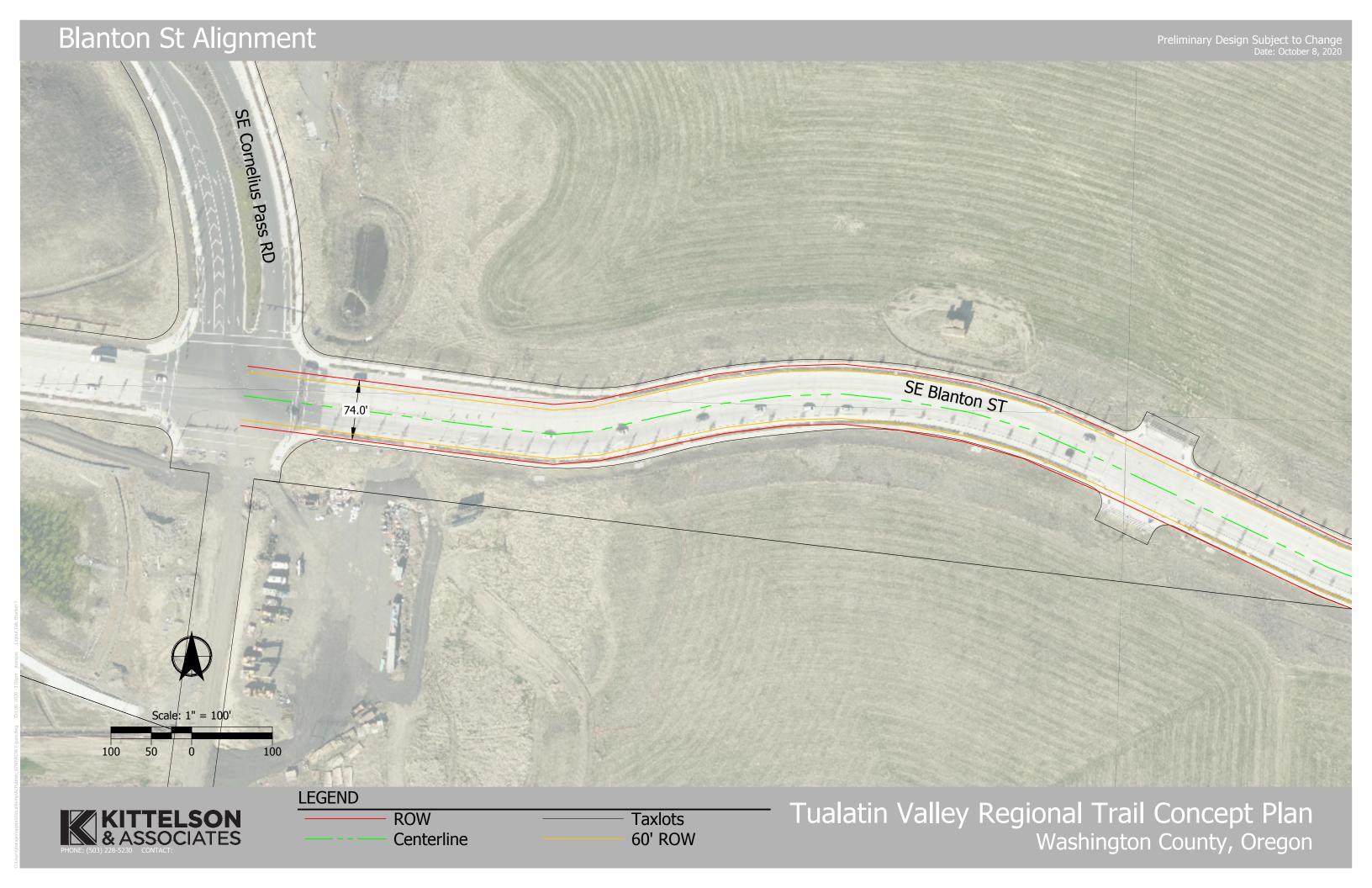


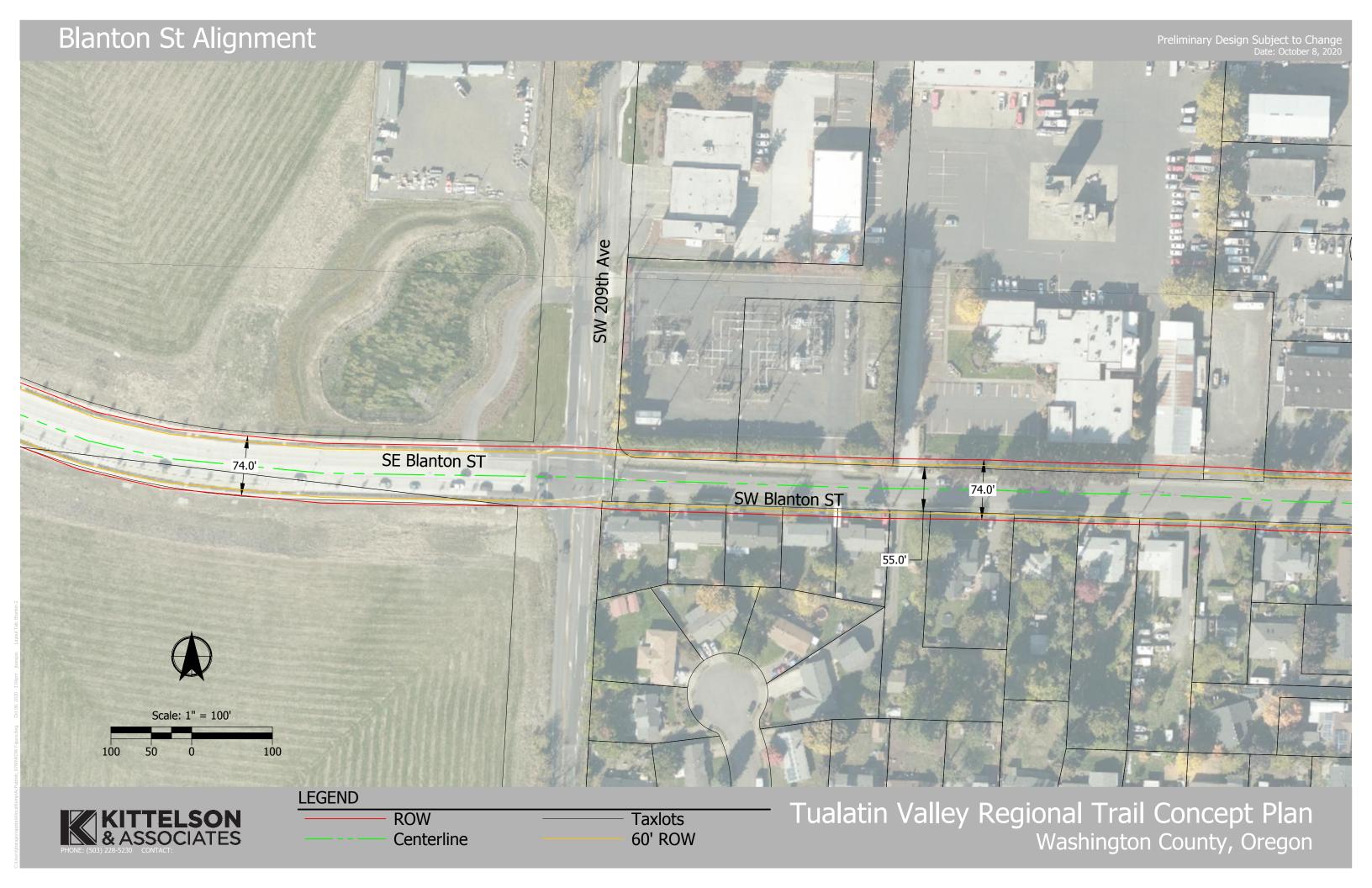


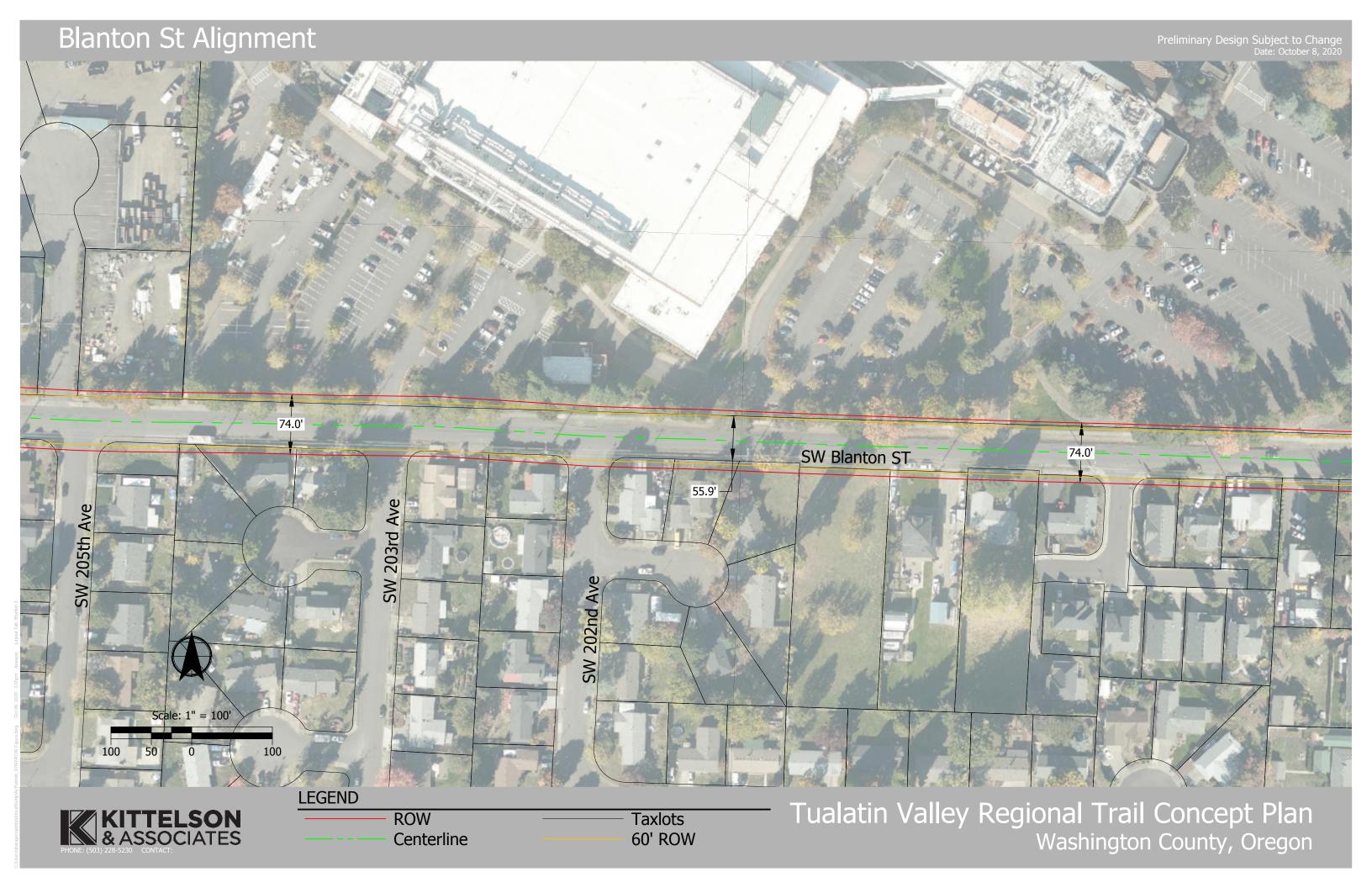


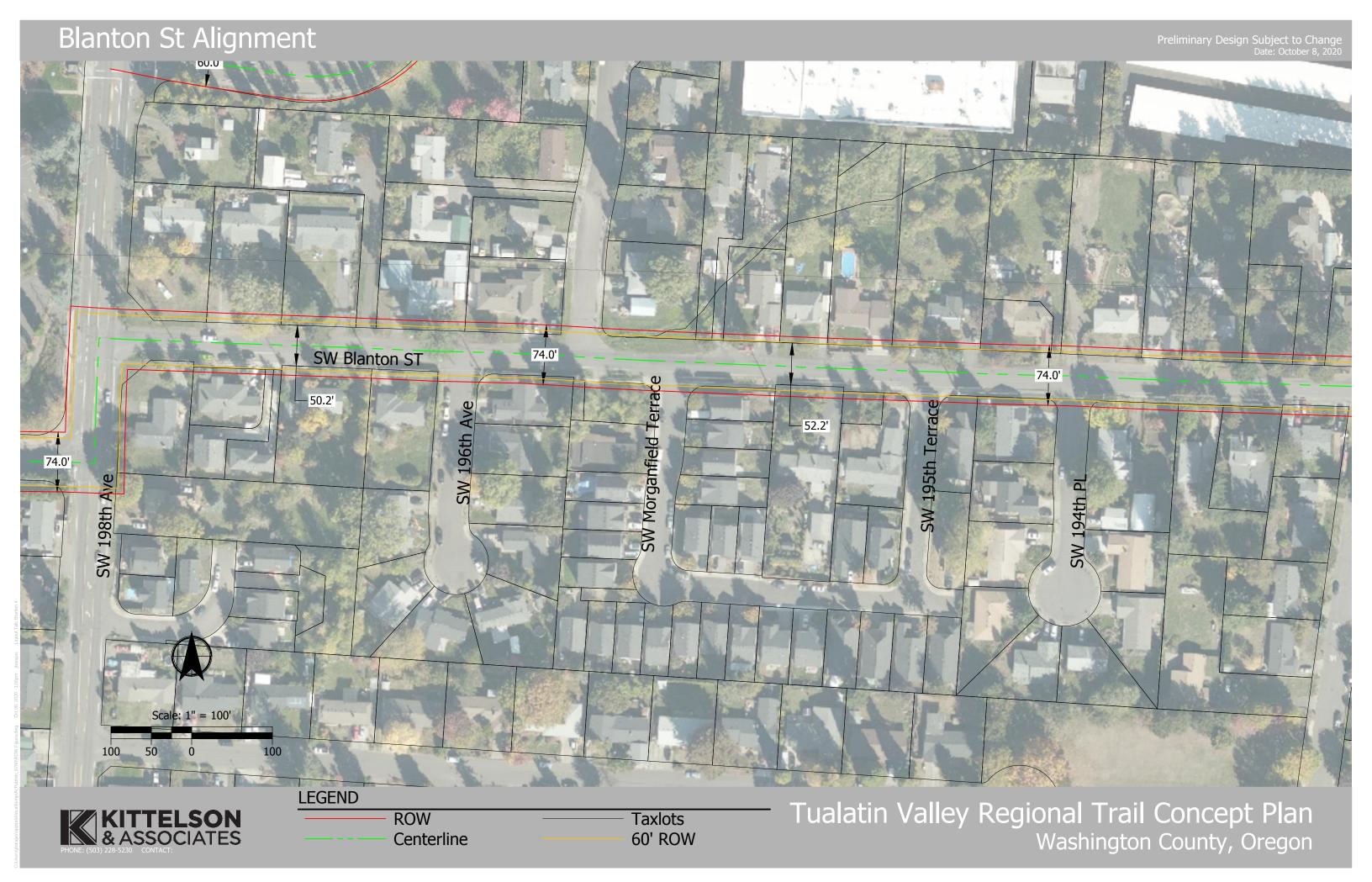








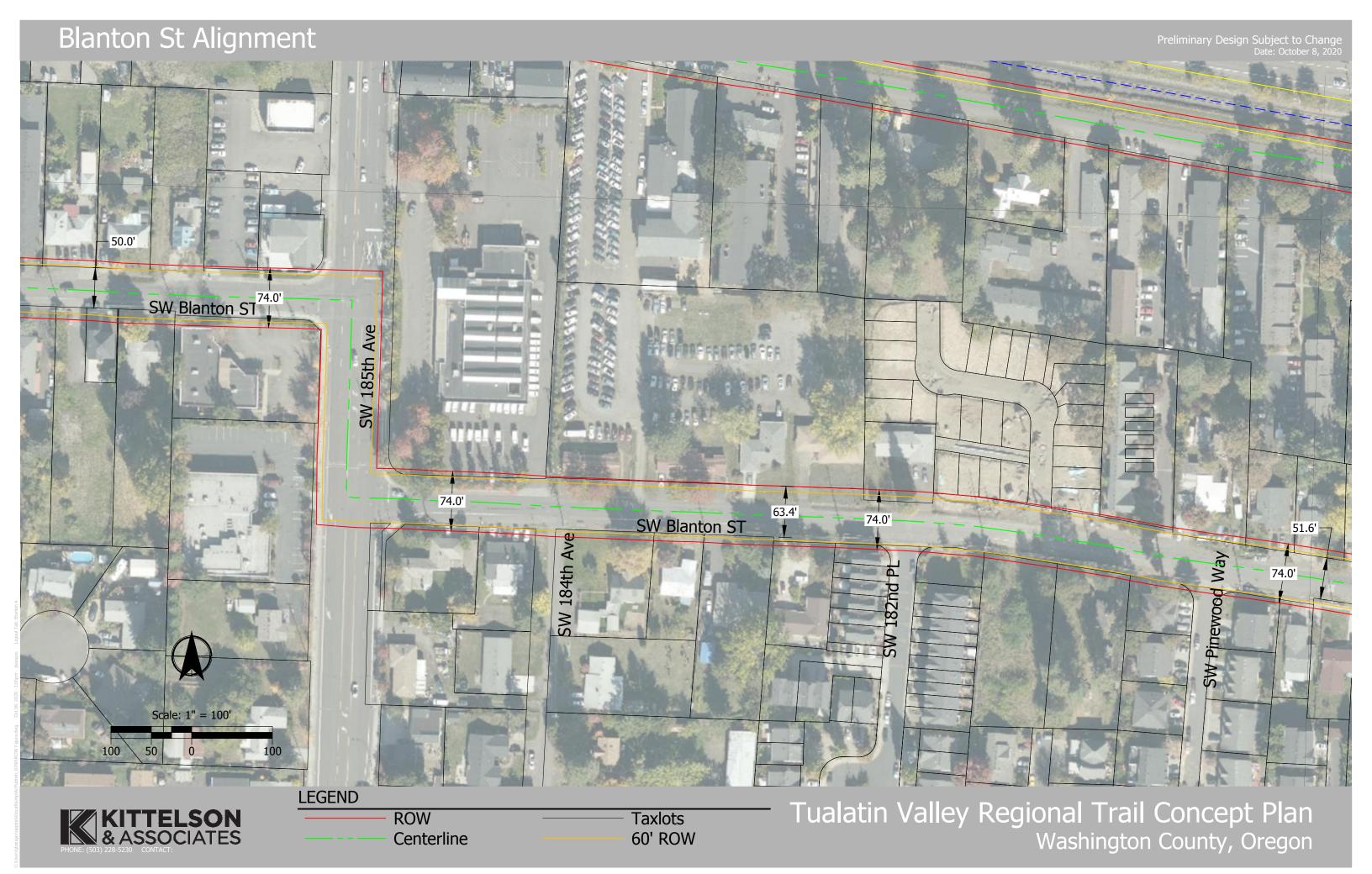


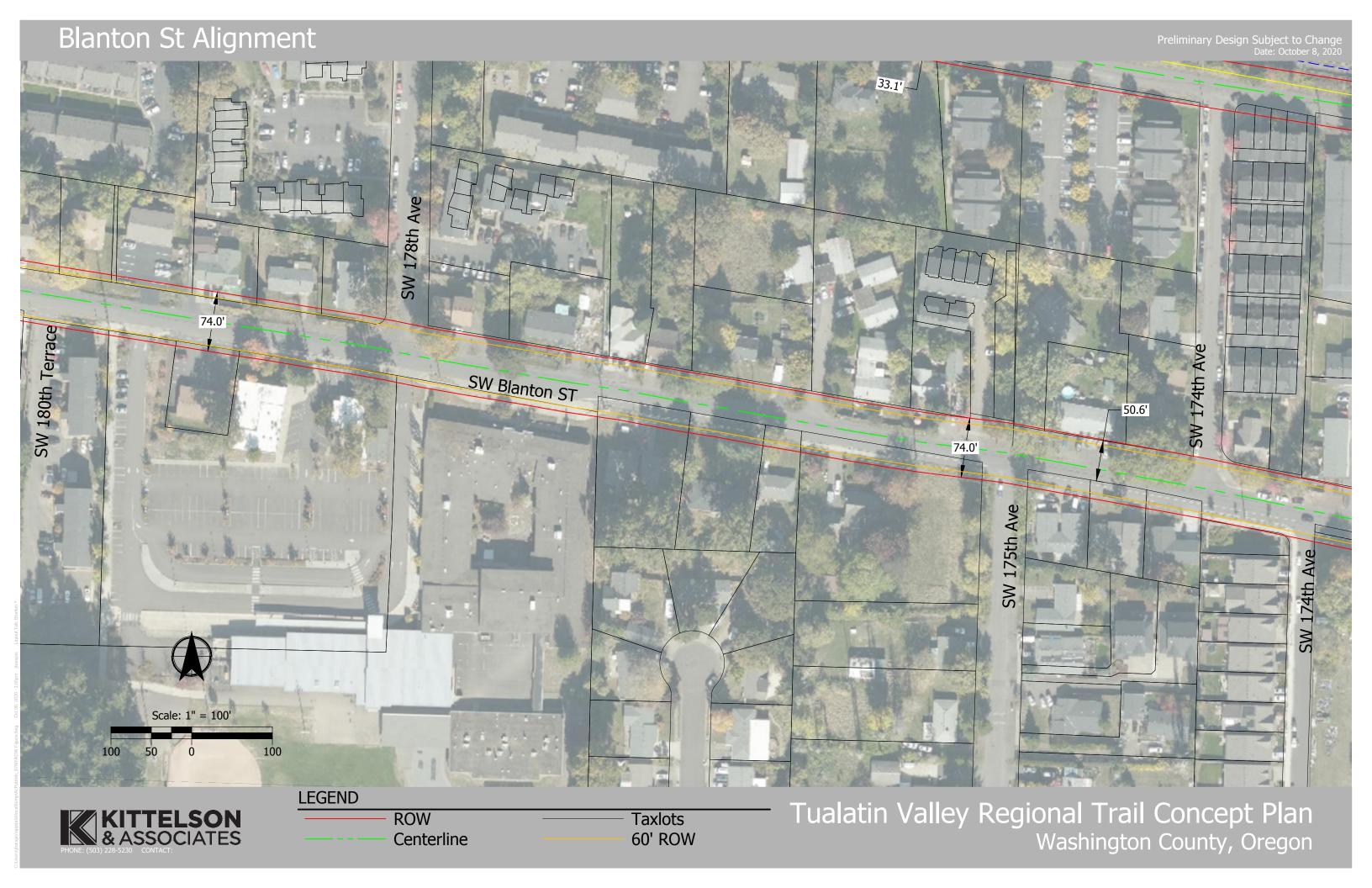




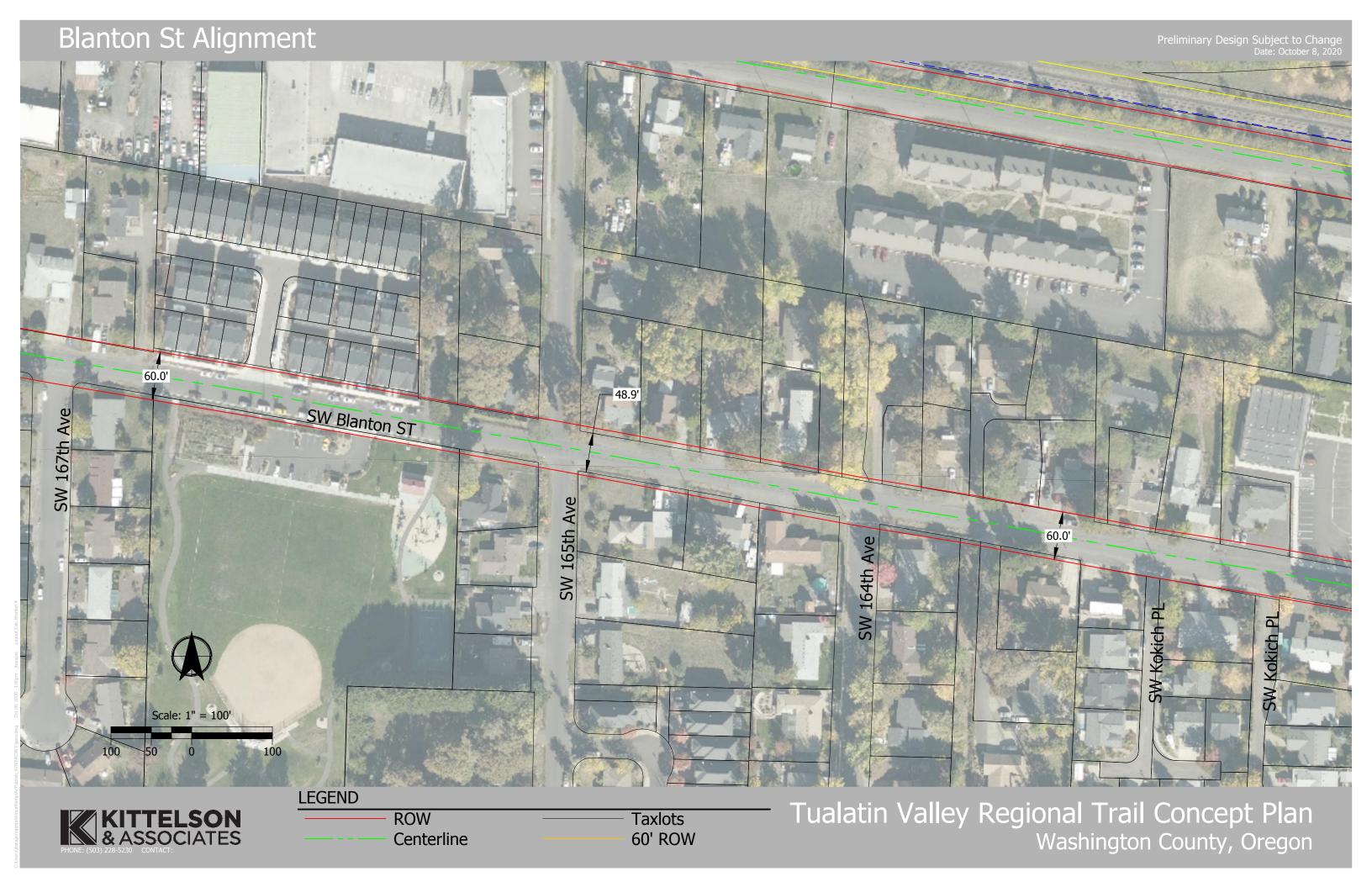
KITTELSON & ASSOCIATES ROW
Centerline

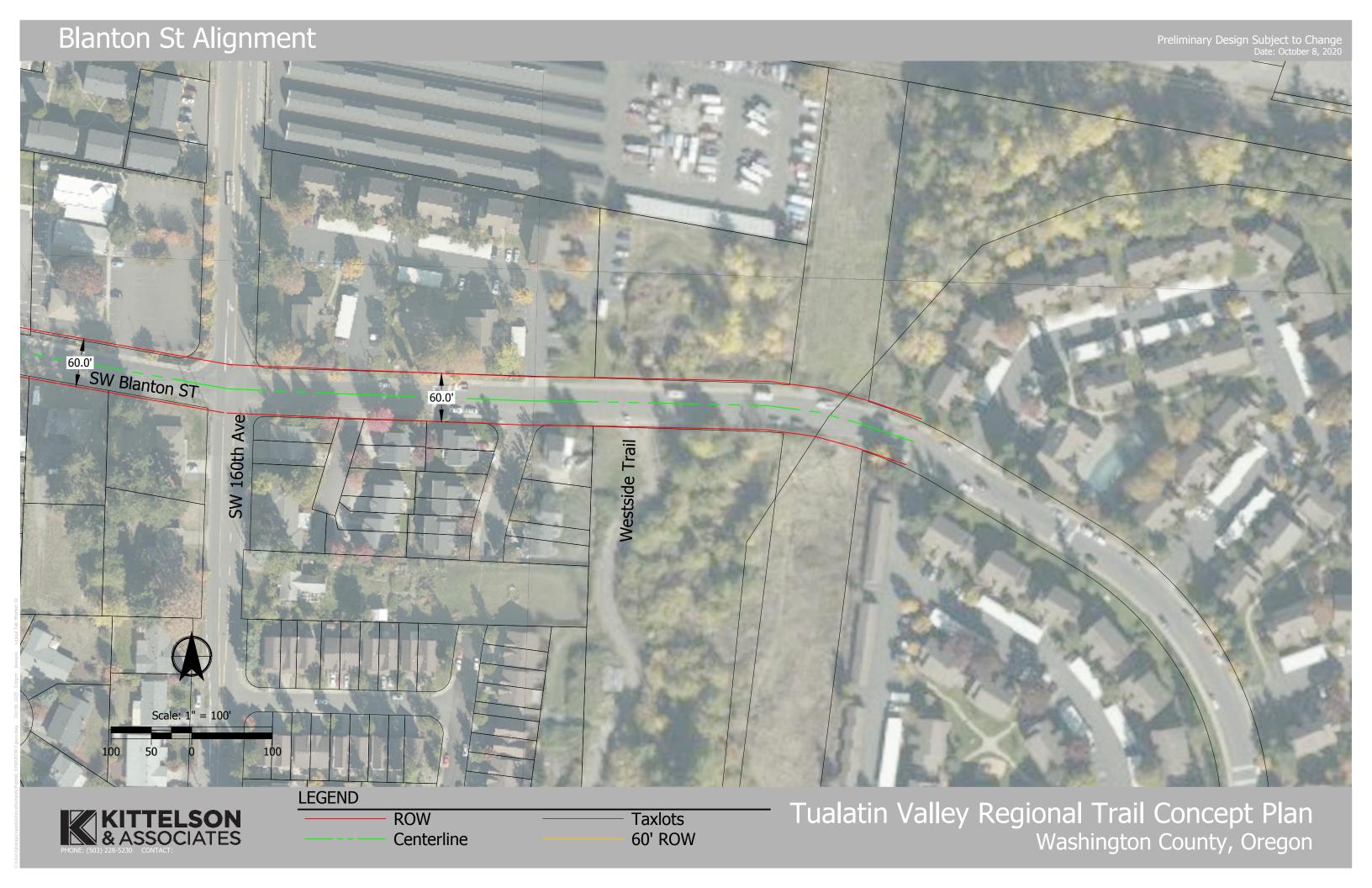
Taxlots 60' ROW Tualatin Valley Regional Trail Concept Plan Washington County, Oregon











Appendix B Comparative Evaluation

Appendix B Comparative Evaluation

Safety

The evaluation metrics for safety include number of intersection crossings by type and number of lanes (i.e. stop control vs. signalized crossing, dedicated phasing for crossing, number of lanes to cross).

Intersection Crossing Evaluation

Table 8 summaries the number of intersection crossings and existing crossing type for each trail alignment from SW Cornelius Pass Road to SW Millikan Way/SW 160th Avenue.

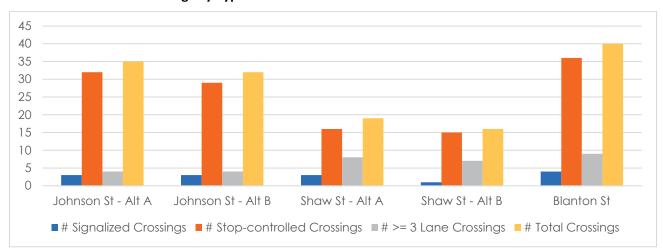


Table 8: Intersection Crossings by Type and Number of Lanes

As summarized in Table 8, SW Blanton Street has the highest number of crossings with the majority being unsignalized; however it has the highest number of crossings greater than or equal to three lanes. The SW Shaw Street alternatives have the lowest number of crossings and the majority of them are signalized; however, many are greater than or equal to 3 lanes and require crossing the railroad tracks twice to access the crosswalk at TV Highway. SW Johnson Street has the second highest number of crossings, with the majority being unsignalized; however, it has the lowest number of crossings with greater than or equal to 3 lanes. Exhibit 5 provides a qualitative comparative evaluation of the Intersection Crossing by Type and Number of Lanes.

Good Fair Poor SW Johnson Street SW Blanton Street (Alternative A) SW Johnson Street (Alternative B) SW Shaw Street (Alternativ A) SW Shaw Street (Alternative B)

Exhibit 5: Intersection Crossings by Type and Number of Lanes – Evaluation

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Connectivity

The evaluation metrics for the equity evaluation criteria include proximity to essential destinations & daily needs (# of destinations adjacent to trail and within ¼ mile) and number of transit stops within ¼ and ½ mile.

Essential Destinations and Daily Needs

TV Trail destinations were provided by Washington County in GIS format. The dataset includes large employers, grocery stores, urgent care, libraries, schools, parks, city hall, and community centers³. This dataset has been used for prior planning efforts in the TV Trail study area. Proximity to schools and parks is included in the Health & Livability evaluation criteria. Table 9 summarizes the number of essential destinations and daily need locations within a ¼ mile proximity of each trail alignment alternatives.

2
2
1
1
1
O
Johnson St - Alt A Johnson St - Alt B Shaw St - Alt A Shaw St - Alt B Blanton St

Large Employers Grocery Stores Urgent Care Community Centers

Table 9: Essential Destinations & Daily Needs within a 1/4 Mile Proximity

As summarized in Table 9, SW Shaw Street Alternative B has the most essential destinations and daily needs located within a ¼ mile proximity followed by SW Shaw Street – Alternative A and SW Blanton Street. Exhibit 7 provides a qualitative evaluation of the Essential Destinations and Daily Needs within ¼ mile proximity criteria.

Exhibit 6: Essential Destinations & Daily Needs within a ¼ Mile Proximity – Evaluation



³ City hall and libraries are not located within the project area. Aloha Grange Hall was added as a Community Center.

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Transit Stops

Transit stop data was extracted from the General Transit Feed Specifications (GTFS) database and queried for TriMet service. ¼ and ½ mile buffers were placed on each of the trail alignment alternatives. ¼ mile represent the distance someone may be willing to walk, while ½ represents the distance someone may be willing to bike to reach transit.

Table 10 summarizes the number of transit stops with a ¼ and ½ mile proximity of each trail alignment alternatives.

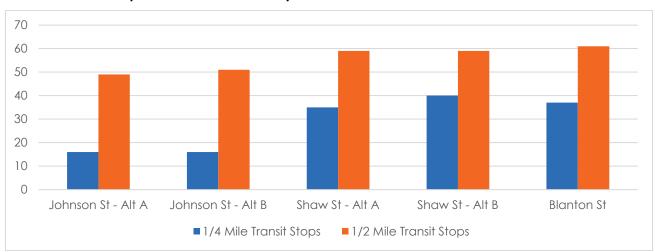


Table 10: Transit Stops within ¼ Mile Proximity

As summarized in Table 10, SW Shaw Street – Alternative B has the most transit stops within a ¼ mile (40), followed by SW Blanton Street (37), and SW Shaw Street – Alternative A (35). Within a ½ mile, SW Blanton Street has the most transit stops (61) followed by SW Shaw Street – Alternative A and Alternative B (59). Exhibit 7 provides a qualitative evaluation of the Transit Stops within ¼ mile proximity.

Exhibit 7: Transit Stops within ¼ Mile Proximity – Qualitative Evaluation



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Health & Livability

The evaluation metrics for health and livability include proximity to parks, open space, schools (# of schools and parks adjacent to trail and within ¼ mile) and adjacent traffic volumes.

Parks, Open Space, and Schools

As summarized previously, TV Trail destinations were provided by Washington County in GIS. The dataset includes the location of schools and parks and natural areas. Table 11 summarizes the number of essential destinations and daily need locations within a ¼ mile proximity of each trail alignment alternatives.

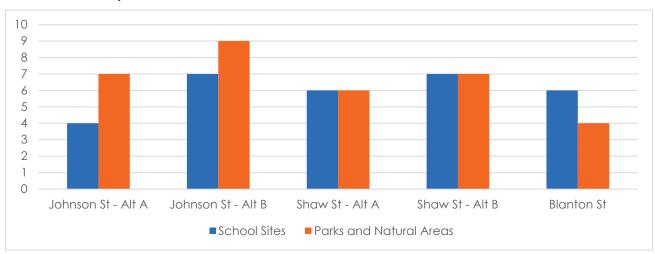
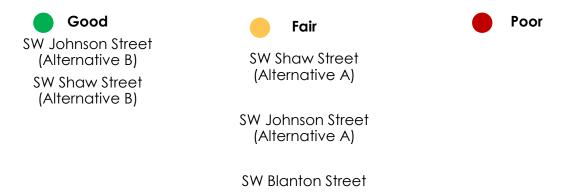


Table 11: Proximity to Schools and Parks and Natural Areas

As summarized in Table 11, SW Johnson Street – Alternative B and SW Shaw Street – Alternative B have the most school sites within a ¼ mile at 7. SW Johnson Street – Alternative B has the most parks and natural areas within a ¼ mile at 9 with SW Johnson Street – Alternative A and SW Shaw Street – Alternative B following at 7. Exhibit 8 provides a qualitative evaluation of the Proximity to Schools and Parks and Natural Areas.

Exhibit 8: Proximity to Schools and Parks and Natural Areas – Qualitative Evaluation



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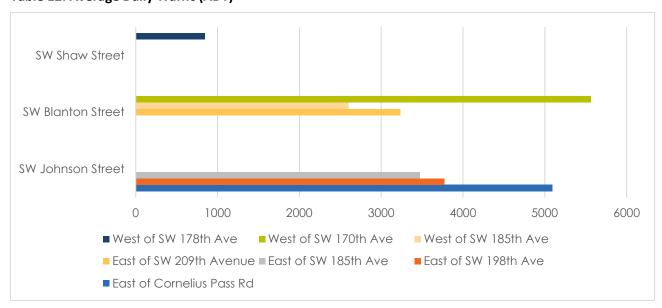
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Adjacent Traffic Volumes

Washington County provided average daily traffic (ADT) volume data as part of the Existing Conditions Memorandum (Reference 3). ADT volumes vary based on availability of data and location along trail alignment alternatives. Table 12 summarizes the ADT along the trail alignment alternatives.

Table 12: Average Daily Traffic (ADT)



As illustrated in Table 12, SW Blanton Street (West of SW 170th Avenue) has the highest ADT, followed by SW Johnson Street (East of Cornelius Pass Road). All three of the locations with available data for SW Johnson Street have ADT exceeding 3,000. The only ADT data point for SW Shaw Street is under 1,000 ADT. Exhibit 9 provides a qualitative evaluation of the Adjacent Traffic Volumes.

Exhibit 9: Adjacent Traffic Volumes – Qualitative Evaluation



Coordination

The evaluation metrics for health and livability include planning level cost estimate and coordination agencies and issues (i.e. railroad, Washington County, Aloha, Hillsboro, Beaverton by # and type of coordination issues).

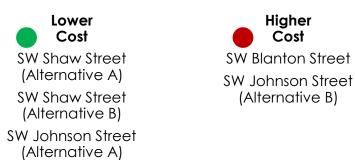
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Planning Level Cost Estimate

At the current level of concept development, planning level-cost estimates are not feasible due to the unknown of facility type and specific trail alignment. Instead, consideration of cost estimate drivers have been compared including anticipated impacts to ROW, enhanced crossing facility needs, and potential cross sections identified in the Draft Trail Alignment Alternatives Memorandum (Reference 2).

Exhibit 10 provides a qualitative comparison of anticipated cost associated with ROW, enhanced crossing facilities, and potential cross sections. SW Blanton Street and SW Johnson Street Alternative B have higher costs due to the need for ROW and widening. Shaw Street has a narrower proposed cross-section that fits within available ROW for much of the route.

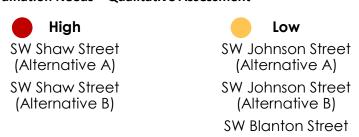
Exhibit 10: Planning Level Cost – Qualitative Assessment



Agency Coordination

Anticipated agency coordination and issues were qualitatively assessed for each alignment alternative. Potential coordination needs can include but are not limited to railroad, community, and local jurisdictions. Exhibit 7 provides a qualitative evaluation of anticipated agency coordination needs. The alternatives have similar coordination issues with the exception of Shaw Street which will have significant railroad coordination issues.

Exhibit 11: Agency Coordination Needs - Qualitative Assessment



Feasibility

No environmental constraints have been identified at this point in the process. Right-of-way and railroad impacts were qualitatively included in the cost comparison and the coordination metric.

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Equity

The evaluation metrics for the equity evaluation criteria includes buffer space and adjacent traffic volumes, traffic speed and noise levels, and percent of population within ¼ mile of facility considered transportation disadvantaged.

Title VI & Demographic Data

Title VI and demographic data was analyzed for the regional trail alignment alternatives using Remix. The analysis includes 200% poverty, people of color, living with a disability, seniors 65+, youth 17-, and limited English for a ¼ mile proximity to trail alignment alternatives. The results of the demographic data analysis are summarized in Table 13.

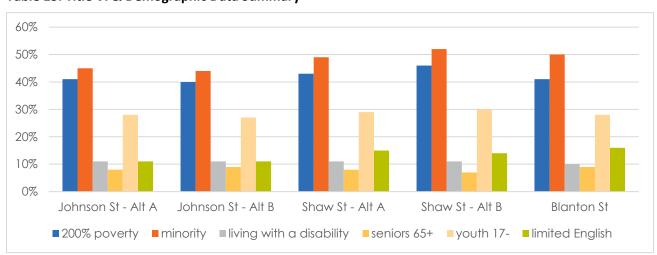
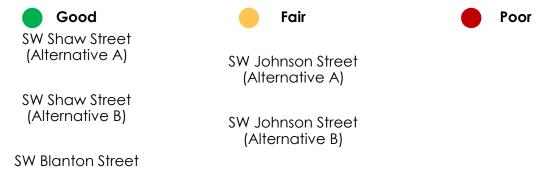


Table 13: Title VI & Demographic Data Summary

As summarized in Table 13, SW Shaw Street – Alternative B exhibits highest percentages of 200% poverty, people of color, youth 17-, and is tied for highest percentage of living with a disability. The SW Shaw Street and SW Blanton Street alignment alternatives exhibited higher percentages of limited English, people of color percentages, and youth 17- compared to the SW Johnson Street alignment alternatives. The SW Johnson Street alignment alternatives tied for highest percentages for living with disabilities, and seniors 65+; however, neither of the SW Johnson Street alignment alternative received standalone highest percentages. Exhibit 12 provides a qualitative evaluation of the Title VI & Demographic data.

Exhibit 12: Title VI & Demographic – Qualitative Evaluation



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Transportation Disadvantaged & Commute Patterns Data

Transportation disadvantaged and commute patterns data from the Census was analyzed for the regional trail alignment alternatives using Remix. The analysis includes car free households, one-car households, and primary means of transportation to work (transit bike⁴, drive alone, carpool, and walk) for a ¼ mile proximity to trail alignment alternatives. The results of the transportation disadvantaged, and commute patterns are summarized in Table 14.

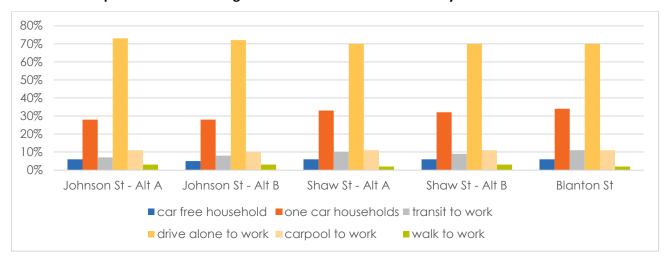
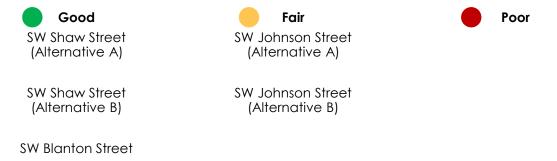


Table 14: Transportation Disadvantaged and Commute Pattern Summary

As summarized in Table 14, the SW Shaw Street and SW Blanton Street alignment alternatives exhibit highest percentages of car free and one car households. While the SW Johnson Street alignment alternative exhibited highest percentages for drive alone to work, the SW Shaw Street and SW Blanton Street alignment alternatives exhibited highest percentages for transit, carpool, and walk to work commute modes. Exhibit 13 provides a qualitative evaluation of the Transportation Disadvantaged and Commute Pattern data.

Exhibit 13: Transportation Disadvantaged and Commute Pattern – Qualitative Evaluation



⁴ All five trail alignment alternatives exhibited 1% of bike to work commute modes based on the ¼ mile radius.



MEMORANDUM

Date: June 16, 2021 Project #: 23021.002

To: Dyami Valentine, Reza Farhoodi, Washington County

Hector Rodriguez-Ruiz, John Russell, Oregon Department of Transportation

From: Nicholas Gross, Sophia Semensky, Susan Wright, PE, PMP

Project: TV Trail Refinement Plan

Subject: Traffic Analysis Memorandum

PURPOSE

The purpose of this memorandum is to evaluate the existing and future traffic conditions including walking and biking activity to identify potential enhanced crossing treatments as well as intersection and segment improvements along the TV Trail alignment(s). This memorandum presents the results of the traffic analysis, enhanced crossing facility analysis, and addresses the potential impacts of the TV Trail alignment (s) on safety, and operations.

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TRAFFIC DATA COLLECTION

Traffic data was obtained within the project study area to evaluate and identify potential intersection and roadway segment improvements as well as potential enhanced crossing treatments along the potential TV Trail alignment(s).

TV Trail Refinement Plan

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Washington County 2018-2019 Tube Count Data

Washington County provided 2018 and 2019 tube count data at eight locations within the vicinity of the project study area. The tube counts provide 24-hour directional traffic volumes, 85th percentile speeds, heavy vehicle percentages, and identify morning and evening peak hours of vehicular activity. Tube count locations and data collection dates are summarized in Table 1.

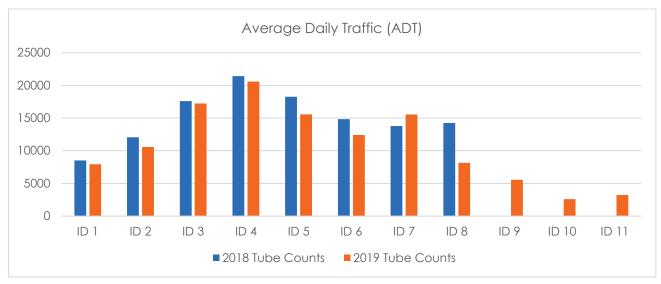
Appendix A includes a map of Washington County's automatic traffic recorder (ATR) station # locations.

Table 1: Washington County 2018-2019 Tube Count Summary

ID	Location	ATR Station #	Date
1	160 th Avenue 0.1 miles north of Farmington Road	Station #320	May 2018/June 2019
2	160 th Avenue 0.1 miles south of TV Highway	Station #349	May 2018/June 2019
3	170 th Avenue 0.1 miles north of Farmington Road	Station #322	April 2018/June 2019
4	185 th Avenue 0.3 miles south of TV Highway	Station #334	May 2018/March 2019
5	198 th Avenue 0.1 miles south of TV Highway	Station #335	April 2018/March 2019
6	198 th Avenue 0.02 miles south of Blanton Street	Station #336	April 2018/March 2019
7	209 th Avenue 0.1 miles north of Kinnaman Road	Station #339	April 2018/March 2019
8	209 th Avenue 0.1 miles south of TV Highway	Station #340	April 2018/March 2019
9	Blanton Street 0.1 miles west of 170 th Avenue	Station #398	June 2019
10	Blanton Street 0.1 miles west of 185 th Avenue	Station #399	March 2019
11	Blanton Street 0.1 miles east of 209 th Avenue	Station #3000	March 2019

The 2018 and 2019 tube count volumes were compared to identify peak average daily traffic (ADT) volumes for use in the enhanced crossing and traffic operations analysis. Exhibit 1 illustrates the comparison of the two datasets.

Exhibit 1: Washington County 2018-2019 Tube Count Comparison



As illustrated in Exhibit 1, ADT between 2018 and 2019 generally decreased with one exception on 209th Avenue, 0.1 miles north of Kinnaman Road (ID 8). 2018 tube count data was unavailable for ID 9, ID 10, and ID 11. The enhanced crossing and traffic operations analyses rely on the higher ADT and peak hour volume between the two datasets.

TV Trail Refinement Plan 2021 Turning Movement Counts

Turning movement count (TMC) data was collected in February 2021 as part of the TV Trail Refinement Plan. TMC data collection was contained to the timeframe of 4:00 to 6:00 PM. In contrast to the 2018 tube counts, the 2021 TMCs provides vehicular turning movements as well as walking, biking, and rolling activity, including crossing volumes at the study area intersections. TMC locations and existing intersection control types are summarized in Table 2.

Table 2: Turning Movement Count Locations

Location (Intersection)	Existing Intersection Control	Date
TV Highway/SW 185th Avenue	Signalized	February 2021
TV Highway/SW 170th Avenue	Signalized	February 2021
TV Highway/SW 160th Avenue	Signalized	February 2021
SW Blanton Street/SW 209th Avenue	Signalized	February 2021
SW Blanton Street/SW 170th Avenue	Signalized	February 2021
SW Blanton Street/SW 185th Avenue (northern intersection)	Unsignalized	February 2021
SW Blanton Street/SW 185th Avenue (south intersection)	Unsignalized	February 2021
SW Blanton Street/SW 160th Avenue	Unsignalized	February 2021
SW Shaw Street/SW 185th Avenue	Unsignalized (Right-in/right-out)	February 2021
SW Shaw Street/SW 170th Avenue	Unsignalized (Right-in/right-out)	February 2021
SW Shaw Street/SW 160th Avenue	Unsignalized	February 2021

The TMC data was compared to the tube counts as well as turning movements in a 2019 Synchro model provided by the County from a TV Highway study that included the Blanton Street and Shaw Street intersections. This data was used to evaluate the need for a center left-turn lane along Blanton Street, signal warrant analyses at existing unsignalized locations, as well as enhanced crossing needs based on roadway volumes.

TRAFFIC OPERATIONAL ASSESSMENT

The traffic operations assessment included looking at the need for left-turn lanes at the existing stop-controlled intersections along the corridors, looking at the need for a center left-run lane along the SW Blanton Street corridor, and looking at signal warrant for the existing stop-controlled intersections.

Left-Turn Lane Analysis for Stop-Controlled Intersections

Traffic operations analysis was performed at the stop controlled intersections along SW Blanton Street where left-turn lanes are not currently provided. A 2019 Synchro model provided by Washington County was used to run analysis of the delay, v/c ratio, and queuing of the intersections in the existing configuration and with a left-turn lane added. This included the following intersections:

- SW Blanton Street / SW 198th Avenue
- SW Blanton Street/SW 185th Avenue
- SW Blanton Street / SW 160th Avenue

The analysis found that in the AM peak hour, the side street v/c ratios for SW Blanton Street/SW 198th Avenue (eastbound), SW Blanton Street/SW 185th Avenue (eastbound), and SW Blanton Street/SW 160th Avenue (eastbound) are above a v/c of 1.0 with or without a left-turn lane. Results for the PM Peak the side street movement v/c ratios for SW Blanton Street/SW 198th Avenue (both the eastbound and westbound off-set approaches), SW Blanton Street/SW 185th Avenue (both eastbound and westbound off-set approaches), and SW Blanton Street/SW 160th Avenue (eastbound approach) are above a volume-to-capacity ratio (v/c) of 1.0 without a potential left-turn lane and SW 185th Avenue and SW 160th Avenue continue to be over capacity with a left-turn lane. The AM Peak Hour results are displayed in Table 3 and results for the PM peak hour are presented in Table 4.

Based on the results of the analysis, adding left-turn lanes at all of these intersections is not recommended. Adding left-turn lanes should be decided on a case-by-case basis as the left-turn is the critical movement at these approaches and the capacity constraint and queuing would be shifted to the left-turn lane from the shared lane if a left-turn lane was added. This could provide minimal benefit to the right-turn and through movements as the left-turn queues are likely to spill back into the through lane. This is an existing condition that will not be significantly impacted by the addition of the regional trail and the half signals when actuated would provide some gaps in traffic for turning movements after the pedestrian has cleared the intersection. Left-turn lanes should be further considered if any of these intersections becomes signalized in the future.

As shown in Exhibit 2, left-turn lanes could be provided at any of these locations (example provided for SW 198th Avenue/SW Blanton Street) but it would increase the crossing distance for pedestrians navigating between the off-set intersections, may increase the use of SW Blanton Avenue by vehicles, and would reduce the shared space for bicycles and pedestrians approaching the intersection to 8-9 feet instead of the desired 12 feet unless additional right-of-way was acquired. As a potential regional trail

route, SW Blanton Street should be kept low-volume, whereas a signal and left-turn lanes would encourage thru-traffic.

Table 3: Left Turn Lane Analysis - AM Peak Hour

		v/c	Delay (seconds)	LOS	Queue (veh)
	SW 198 th Ave. – North Intersection (WBL/R)	0.39	23	С	1.8
	SW 198th Ave.– South Intersection (EBL/R)	1.34	202	А	22.9
Existing Configuration	SW 185 th Ave North Intersection (EBL/R)	1.50	280	F	21.8
	SW 185 th Ave South Intersection (WBL/R)	0.45	20	С	2.2
	SW 160 th Ave. (EBL/R)	2.96	941	F	43.5
	SW 198 th Ave North Intersection (WBL)	0.18	20	С	0.5
	SW 198 th Ave - North Intersection (WBR)	0.24	18	С	0.9
	SW 198 th Ave - South Intersection (EBL)	1.22	163	F	17
	SW 198 th Ave - South Intersection (EBR)	0.12	10	А	0.4
With Side-street Left-turn Lane	SW 185 th Ave North Intersection (EBL)	1.36	233	F	16.5
Leit-tuili Laile	SW 185 th Ave North Intersection (EBR)	0.13	12	В	0.5
	SW 185 th Ave South Intersection (WBL)	0.35	55	F	1.4
	SW 185 th Ave South Intersection (WBR)	0.46	24	С	2.4
	SW 160 th Ave. (EBL)	2.71	869	F	23.8
	SW 160 th Ave. (EBT/R)	0.24	10	В	0.9

Note: Grey shading indicates movement over capacity or having over 300 seconds of delay in which case the queuing result is not accurate.

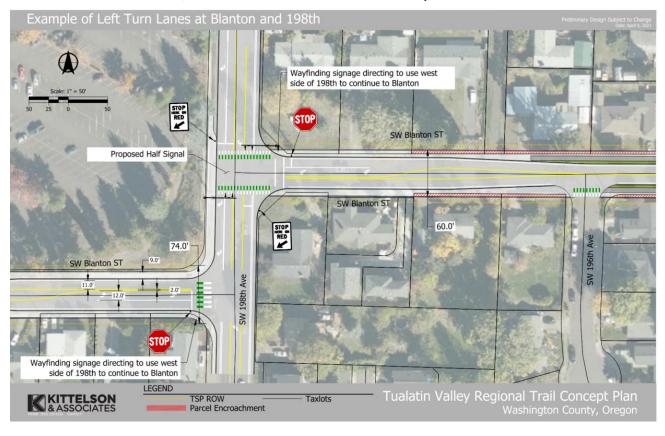
Table 4: Left Turn Lane Analysis - PM Peak Hour

		v/c	Delay (seconds)	LOS	Queue (veh)
	SW 198 th Ave. – North Intersection (WBL/R)	1.44	259	F	20
	SW 198th Ave.– South Intersection (EBL/R)	1.15	125	F	16.8
Existing Configuration	SW 185 th Ave North Intersection (EBL/R)	2.97	965	F	33
	SW 185 th Ave South Intersection (WBL/R)	1.46	262	F	22.5
	SW 160 th Ave. (EBL/R)	8.49	3530	F	49.1
	SW 198 th Ave North Intersection (WBL)	0.62	53	F	3.4
	SW 198 th Ave - North Intersection (WBR)	0.83	57	F	6.9
	SW 198 th Ave - South Intersection (EBL)	0.84	58	F	7.1
	SW 198 th Ave - South Intersection (EBR)	0.31	13	В	1.3
With Side-street Left-turn Lane	SW 185 th Ave North Intersection (EBL)	2.55	805	F	21.5
Leit-tuili Laile	SW 185 th Ave North Intersection (EBR)	0.40	25	D	1.9
	SW 185 th Ave South Intersection (WBL)	1.02	141	F	7.6
	SW 185 th Ave South Intersection (WBR)	0.44	16	С	2.3
	SW 160 th Ave. (EBL)	5.71	2457	F	16.5
	SW 160 th Ave. (EBT/R)	2.71	860	F	26.5

Note: Grey shading indicates movement over capacity or having over 300 seconds of delay in which case the queuing result is not accurate.

Appendix B includes the traffic analysis summary.

Exhibit 2: SW Blanton Street/ SW 198th Avenue Left-Turn Lane Example



Center Left-Turn Lane Warrant Analysis

A center left-turn lane warrant analysis was conducted to evaluate the need for a center left-turn lane along SW Blanton Street at any of the local side streets or major driveways.

The Oregon Department of Transportation (ODOT) *Analysis Procedure Manual (APM), Chapter 12 – Left Turn Lane Evaluation Process* outlines a methodology to determine whether a left-turn lane is warranted on a mainline at an intersection approach based on the following variables.

- The advancing volume left, thru, and right-turn peak hour volumes at the study approach
- Percent left-turns percentage of left-turns of the total study approach peak-hour volume
- The opposing volume thru and right-turn peak hour volumes of the approach opposite the study approach
- Speed of the study street
- Critical gap, maneuver time, exit time, and utilization factor default values assumed

PM peak hour 2019 tube counts were used for this analysis on SW Blanton Street between SW 185th Avenue and SW 170th Avenue, which was the highest volume segment. No volumes were available on any driveways or local streets along SW Blanton Street, so a sensitivity analysis was carried out to determine the number of left turns into driveways or local streets needed to trigger a center left-turn lane. For the eastbound approach, with 298 approaching vehicles and 194 opposing vehicles, results of the analysis indicate that a center turn lane is warranted for left turn volumes only with left turn volumes over approximately 100 vehicles.

Thus, based on the eastbound and westbound through movement volumes and the number of turns that would be needed at one location or within close proximity to meet the warrant, a continuous center left-turn lane is not warranted along the corridor or anticipated to be needed at any of the existing local street intersections or driveways.

Appendix B includes the center left-turn analysis worksheets.

Signal Warrants

Signal warrant analyses were prepared for the unsignalized intersection locations along the potential trail alignment(s) under existing 2021 peak hour conditions. The signal warrant analysis evaluates the eight hour (Warrant #1), four hour (Warrant #2), and peak hour (Warrant #3) conditions as described in the Manual on Uniform Traffic Control Devices (MUTCD) and based on the respective traffic volumes and intersection configurations. Table 5 summarizes the results of the signal warrant analysis.

Table 5: Signal Warrant Analysis Summary

Intersection	Peak Hour	Warrant #1 (Eight Highest)	Warrant #2 (Four-Hour)	Warrant #3 (Peak Hour)
Blanton Street/160 th Avenue	4:40 PM	No	No	No
Blanton Street/185th Avenue (northern leg)	4:30 PM	No	No	No
Blanton Street/185th Avenue (southern leg)	4:35 PM	No	Yes	Yes
Shaw Street/160 th Avenue	4:30 PM	No	No	No

Preliminary signal warrants indicate that Warrant #2 and Warrant #3 are met under existing 2021 peak hour conditions at the Blanton Street/185th Avenue (southern leg) intersection.

Blanton Street/185th Avenue Conceptual Realignment

The reconfiguration of the existing off-set intersections of Blanton Street/185th Avenue (northern leg) and Blanton Street/185th Avenue (southern leg) was explored to determine the feasibility of aligning the intersections to create a "traditional" four-legged intersection. Aligning and signalizing the crossing of Blanton Street/185th Avenue would create a single stage crossing maneuver and a protected phase for people crossing.

A signal warrant analysis was prepared for a realigned intersection configuration combining the peak hour approaching volumes of the off-set intersections. Westbound approaching volumes from the Blanton Street/185th Avenue (southern leg) were combined with the north, south, and eastbound approaching volumes from the Blanton Street/185th Avenue northern leg). Table 6 summarizes the results of the signal warrant analysis.

Table 6: Realigned Blanton Street/185th Avenue Signal Warrant Analysis Summary

Intersection	Peak Hour	Warrant #1 (Eight Highest)	Warrant #2 (Four-Hour)	Warrant #3 (Peak Hour)
Blanton Street/185th Avenue (realigned)	4:30 PM	No	Yes	Yes

Preliminary signal warrants indicate that traffic signal warrants are met for the fourth and eight highest hours under existing 2021 peak hour conditions at the realigned Blanton Street/185th Avenue intersection. The *Preferred Alignment and Considerations Memorandum* illustrates the potential alternative alignments for a realigned intersection and the right-of-way impacts this would have.

Although warranted, this improvement would increase the traffic volumes on SW Blanton Street and provide an easy parallel route to TV Highway from SW 160th Avenue to SW 198th Avenue. This type of improvement could be counterproductive to creating a regional trail quality facility on SW Blanton Street and opportunities to reduce traffic volumes and lower the functional classification of SW Blanton Street from a collector to neighborhood route should be explored (SW Blanton Street is currently a neighborhood route east of SW 170th Avenue). *Appendix C contains the traffic signal warrant analysis*.

CROSSWALK ASSESSMENT (UNSIGNALIZED INTERSECTIONS)

A crosswalk assessment was conducted for each of the intersections along the corridors that are stop controlled in the east-west direction including SW 198th Avenue, SW 185th Avenue, and SW 160th Avenue along SW Blanton Street and SW 185th Avenue, SW 170th Avenue, and SW 160th Avenue along SW Shaw Street. The assessment included an assessment of the appropriate level of protection needed at each crossing, followed by an assessment of appropriate countermeasures. The following describes these two assessments plus the findings for each intersection.

National Cooperative Highway Research Program Report 562 Improving Pedestrian Safety at Unsignalized Crossings

The National Cooperative Highway Research Program (NCHRP) Report 562 *Improving Pedestrian Safety at Unsignalized Crossings* (Reference 2) provides a methodology for evaluating appropriate levels of crosswalk protection based on traffic volumes, travel speeds, pedestrian/bicycle crossing volumes, and a number of other factors. The NCHRP Report 562 methodology was applied at the crossing sites to see if it supports an enhanced crossing and what level of crosswalk protection is needed under existing traffic conditions.

NCHRP Report 562 identifies multiple levels of crosswalk protection and types of enhanced crossing treatments under each level. The levels and treatments relevant to this study include:

- Supplemental signs and pavement markings: advance warning signs and advance stop bars and signs
- Geometric features: pedestrian refuge islands, curb extensions, and roadway narrowing
- Active or enhanced crossing treatments: high visibility pavement markings and signs (sidemounted or overhead), and supplemental lighting
- Red crossing treatments: RRFBs (see below), pedestrian hybrid beacons (PHB), and pedestrian mid-block signals

NCHRP Report 562 does not include RRFBs as a potential enhanced crossing treatment (RRFBs were not an approved device when the report was prepared). Therefore, information provided in the County's Mid-Block Crossing Policy, which provides general guidance on the use of RRFBs, and information provided in the 2006 report prepared by the City of Boulder, *Pedestrian Crossing Treatment Installation Guidelines*, was used to supplement the NCHRP Report 562.

PHBs (also known as High-intensity Activated crossWalKs, or HAWKs) are currently not supported by Washington County on their facilities. Given the challenges associated with RRFBs on five-lane facilities, half-signals will be considered at potential crossing sites as a similar treatment. Further evaluation of these sites will be required by the County to determine the appropriate form of traffic control before construction.

Federal Highway Administration (FHWA) Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations

The FHWA *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* (Reference 1) was produced as part of the Safe Transportation for Every Pedestrian (STEP) program and provides guidance on selecting appropriate countermeasures to help improve pedestrian safety at uncontrolled crossing locations.

The Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations provides a matrix of countermeasure options for evaluating appropriate levels of crosswalk protection based on roadway configurations, posted speed limit, and average annual daily traffic (AADT). Figure 1 illustrates the countermeasure matrix and highlights the applicable matrix cell based on the roadway configuration, posted speed limit, and AADT within the study area.

Figure 1: Application of Pedestrian Crash Countermeasures by Roadway Feature

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3 lanes with raised median (1 lane in each direction)	4	5		7	5	9	0	5	0	4	5	9	0	5	0	0	5	0	4	5	9	0	5	0		5	0
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4+ lanes with raised median	0	_	0	0		8	0		3	0	_	0	0		0	0		3	0	_	0	0	_	8	0		0
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O Signifies that crosswalk visibili	tv er	har	cer	nen	ts s	houl	ld			5			exter														
always occur in conjunction v							0.68			7					•	e islo d-Flo		na F	Sea	con	(RI	?FB\	**				
The absence of a number signific	ne th	nat t	ho	יוממ	nto	rma	dell	ro		8			Diet		(api	w 110	40111	ng t	Jour	5011	fiel	., 0)					
is generally not an appropriate to	eati	men	it, b	ut e	XCE	eptic	ons	ma	у	9	Pe	des	triar	1 Ну	/brid	d Be	aco	n (F	PHB)**							
be considered following enginee	ring	jud	gm	ent.	_																						

Roadway configurations, posted speed, and (AADT) at uncontrolled study area intersections along the TV Trail alignment(s) were reviewed to determine appropriate pedestrian countermeasures based on the guidance summarized in Figure 1.

Crosswalk Recommendations

The following summarizes the level of crossing protection that is recommended at each of the existing unsignalized intersections along the corridors.

SW Blanton Street/SW 198th Avenue

A half signal is recommended at the intersection of SW Blanton Street/SW 198th Avenue to provide a fully protected crossing for trail users. The half signal is recommended to be installed at the northern off-set intersection. Under this scenario, a two-way shared-use path is recommended along the west side of 198th Avenue between the northern and southern off-set intersections to traverse trail uses between the intersection approaches. The location of the shared-use path and half signal was selected due to available right-of-way on the west side of SW 198th Avenue.

SW Blanton Street/SW 185th Avenue

A half signal is recommended at the intersection of SW Blanton Street/SW 185th Avenue to provide a fully protected crossing for trail users. Due to the proximity of railroad infrastructure at the northern off-set intersection, it is recommended that the half signal be installed at the southern off-set intersection to avoid railroad conflict. Under this scenario, a two-way shared-use path is recommended along the west side of SW 185th Avenue between the off-set intersections to traverse trail uses between the intersection approaches.

SW Blanton Street/SW 160th Avenue

A half signal is recommended at the intersection of SW Blanton Street/SW 160th Avenue to provide a fully protected crossing for trail users. In addition, a pedestrian refuge island is recommended at the northbound approach to provide an optional two-staged crossing for people walking and biking¹.

SW Shaw Street/SW 185th Avenue

A half signal is recommended at the intersection of SW Shaw Street/SW 185th Avenue to provide a fully protected crossing for future trail users. Signal coordination with the existing traffic signal at the TV

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¹ Sidewalk improvements including ADA ramp upgrades are recommended in the southwest corner of the intersection to provide a continuous connection for people crossing 160th Avenue to points west along Blanton Street.

Highway/SW 185th Avenue intersection and adjacent railroad crossing must be explored (See Shaw Street Crossings and Railroad Operations Impacts section).

SW Shaw Street/SW 170th Avenue

A half signal is recommended at the intersection of SW Shaw Street/SW 170th Avenue to provide a fully protected crossing for future trail users. Signal coordination with the existing traffic signal at the TV Highway/SW 170th Avenue intersection and adjacent railroad crossing must be explored (See Shaw Street Crossings and Railroad Operations Impacts section).

SW Shaw Street/SW 160th Avenue

A half signal is recommended at the intersection of SW Shaw Street/SW 160th Avenue to provide a fully protected crossing for future trail users. Signal coordination with the existing traffic signal at the TV Highway/SW 160th Avenue intersection and adjacent railroad crossing must be explored (See Shaw Street Crossings and Railroad Operations Impacts section).

Appendix D includes the detailed crossing treatment and countermeasures assessments for each intersection.

SHAW STREET CROSSINGS AND RAILROAD OPERATIONAL IMPACTS

Based on the results of the *NCHRP Report 562* analysis and *FHWA Guide for Pedestrian Safety at Uncontrolled Crossing Locations*, the recommended treatment along SW Shaw Street at SW 185th Avenue, SW 170th Avenue, and SW 160th Avenue is a half signal. The installation of a half-signal at these locations will allow for signal coordination with the adjacent signals along TV Highway; however, challenges are associated with the implementations of signal coordination and physical infrastructure of the half signal.

Signal Coordination Challenges

Consistent at each potential half signal location along SW Shaw Street, the half signal and TV Highway signals must be coordinated to provide coordinated signal phasing (e.g., a green for the pedestrians at the half signal on SW Shaw Street corresponds to a green on east-west TV Highway).

To reduce potential conflict between vehicles turning southbound from TV Highway and future trail users, westbound lefts and eastbound right-turns from TV Highway must be prohibited during the green half signal phase for pedestrians crossing at SW Shaw Street. Dedicated left-turn and right-turn lanes are located along TV Highway at the east and westbound approaches to SW 170th Avenue and SW 160th Avenue; however, these do not have storage sufficient to avoid queue spillback into eastbound through lanes. At the intersection of SW 185th Avenue, only a dedicated westbound left-turn lane is present, no dedicate eastbound right-turn lane exists².

In order to install a pedestrian half signal at SW Shaw Street/SW 185th Avenue, a dedicated right-turn lane is needed at the eastbound approach to TV Highway/SW 185th Avenue to prohibit right-turning movements while a green phase is provided at the half signal of SW Shaw Street.

Physical Infrastructure Challenges

The physical space for additional signal equipment is limited at the SW Shaw Street/SW 185th Avenue and SW Shaw Street/SW 170th Avenue intersections. In particular, the intersection of SW Shaw Street with SW 170th Avenue is close to the intersection of TV Highway with SW 170th Avenue, making a half-signal challenging due to space constraints and lack of queuing storage.

For SW Shaw Street/SW 185th Avenue, a separate mast arm and pole are required for the installation of the half-signal on the far side of each intersection approach. Based on a preliminary planning-level assessment, the view of the proposed half-signals may be obstructed by the existing railroad infrastructure at the northbound approach to SW Shaw Street/SW 185th Avenue. For this reason, the

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² The eastbound right-turn occurs from a shared right-through lane.

concept design of the half signal includes a curb extension that restricts westbound right-runs at the SW Shaw Street/SW 185th Avenue intersection, creating space for locating signal poles south of the railroad.

Appendix E includes schematics illustrating the potential visual conflicts between the railroad infrastructure and half signal if a curb extension was not installed and the half signal was located north of the railroad crossing ³.

SW BLANTON STREET FUNCTIONAL CLASSIFICATION CONSIDERATIONS

SW Blanton Street is classified as a Collector between SW 209th Avenue and SW 170th Avenue and a Neighborhood Route east of SW 170th Avenue in the Washington County Transportation System Plan (TSP). According to the TSP, "Neighborhood Routes connect to the Collector and Arterial system, but do not serve citywide or community circulation. On these routes, neighborhood traffic management measures are allowed, including speed humps and traffic circles. Design parameters for Neighborhood Routes with two lanes include no bike lanes, 60-feet maximum right-of-way (ROW), and 36-feet max paved width."

SW Blanton Street Context and Access

Between SW 170th Avenue and SW 185th Avenue, SW Blanton Street provides access to the International School of Beaverton, Aloha-Huber School, and residential homes. Between SW 185th Avenue and SW 198th Avenue, SW Blanton Street functions primarily to serve residential access. West of 198th Avenue, SW Blanton provides residential access on the south side of the roadway and mixed-use, industrial access including parcels on the north side of the roadway including Intel.

Existing and Recommended Cross Section

SW Blanton has one lane in each direction and is recommended to maintain two lanes (one-lane in each direction) with a typical cross-section right-of-way of 60 feet as part of the recommended regional trail facility⁴ apart from turn lanes at SW 170th Avenue and on-street parking where ROW allows. The design parameters for Collectors with two lanes includes bike lanes, 74 feet ROW, and 50-feet paved width. Implementing a 74-foot cross section throughout the corridor would have significant impacts to adjacent properties and will require significant acquisitions to accommodate the cross-section width. Where 74-feet of ROW could be acquired, on-street parking will be explored.

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³ Half signal heads cannot be installed on existing railroad crossing infrastructure.

⁴ Existing Left-turn lanes will be maintained at SW 170th Avenue although removing them could be further evaluated if the functional classification of SW 170th Avenue is downgraded.

Functional Classification Consideration

Based on the roadway context, adjacent land uses, the existing and future recommended cross section, proposed ROW width, and the recommended alignment of the TV Trail, consideration should be given to amending the Washington County TSP function classification of SW Blanton Street to a Neighborhood Route, similar to SW Blanton Street's current classification east of SW 170th Avenue. The change in functional classification will benefit regional trail users by allowing traffic calming features to be implemented, reducing vehicular speeds, volumes, and allowing more flexibility for design treatments to meet the needs of all ages and abilities.

RECOMMENDATIONS

The following section provides the consultant team recommendations for SW Shaw Street and SW Blanton Street as well as the overall recommendation for a preferred regional trail alignment based on the crossing opportunities, challenges, and considerations.

SW Shaw Street Recommendation

SW Shaw Street presents significant challenges in providing direct and protected crossing facilities due to the proximity of the railroad, railroad crossing infrastructure, and railroad signal coordination. The recommended type of protection is a half-signal at the intersections of SW Shaw Street with SW 185th Avenue, which would require coordination with TV Highway signals to prohibit turning movement conflicts from TV Highway with the SW Shaw Street pedestrian crossing movements. A preliminary assessment determined that a dedicated right-turn lane would be required at the intersection of TV Highway/SW 185th Avenue to control the eastbound right-turn movement when the half signal is activated and additional storage may be needed for the eastbound right-turns. Due to the challenges associated with proximity to TV Highway, it is recommended that trail users cross SW 170th Avenue at TV Highway but that the crossing at TV Highway be modified so that SW 170th Avenue could be crossed in one stage rather than two stages by removing the porkchop island. At SW 160th Avenue, it is recommended that trail users be directed to cross at either TV Highway or at Blanton Street to continue to either the north or south Westside Trail connection. This would not require any out of direction travel. Wider sidewalks should be provided on both sides of SW 160th Avenue from TV Highway to Blanton Street to help connect trail users.

The improvements near the railroad and of the railroad crossings, with or without half signals, will require coordination with the railroad will likely require upgrades to the existing signal equipment and railroad crossing panels. If the half signal is not approved at SW Shaw Street/SW 185th AvenueSW Shaw Street may not be suitable as the regional trail alignment; however, the cross-section improvements should still be considered to enhance local access to transit on TV Highway.

SW Blanton Street

SW Blanton Street presents opportunities to implement signalized crossings for regional trail users by implementing half-signals at SW 160th Avenue, SW 185th Avenue, and SW 198th Avenue. SW 170th Avenue is currently signalized.

Several alternatives at SW 185th Avenue were explored to provide a crossing for regional trail users. Based on a planning-level assessment, a half-signal at the southern off-set intersection with a shared-use path along the west side of SW 185th Avenue is recommended. This configuration could be signalized in the future by realigning the intersections at one location, signalizing only one intersection and restricting movements at the other, or by incorporating both approaches of SW Blanton Street into an off-set signalized intersection. Realigning and signalizing the SW 185th Avenue intersection was considered and

is not recommended due to the potential for increased traffic along SW Blanton Street as a consequence to creating a parallel, continuous connection to TV Highway.

Operations at the unsignalized stop-controlled intersections of Blanton and SW 198th Avenue, SW 185th Avenue, and SW 160th Avenue indicate that the side street approaches are operating over capacity and have significant queuing during peak hours under existing conditions. Adding side street left-turn lanes at these intersections should be decided on a case-by-case basis as the left-turn is the critical movement and the capacity constraint and queuing would be shifted to the left-turn lane from the shared lane with if a turn lane was added. This could provide minimal benefit to the right-turn and through movements as the left-turn queues are likely to spill back into the through lane. This is an existing condition that will not be significantly impacted by the addition of the regional trail and the half signals when actuated would provide some gaps in traffic for turning movements after the pedestrian has cleared the intersection. Left-turn lanes should be further considered if any of these intersections becomes signalized in the future.

The findings of this memorandum have been incorporated into the development of the conceptual design and layout for SW Blanton Street included in *Draft Trail Alignment Alternatives & Evaluation Memorandum*.

NEXT STEPS

The *Traffic Analysis Memorandum* and *Preferred Alignment and Concept Design Memorandum* will be shared the advisory committees. The recommendations will be shared with the public via an online open house. Based on the advisory committee and public input, the draft concept design will be refined and advanced into the Draft TV Trail Refinement Plan.

REFERENCES

- 1. FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations
- 2. NCHRP Report 562 Improving Pedestrian Safety at Unsignalized Crossings

APPENDICES

- A. Map of Automatic Traffic Recorder (ATR) Station Locations
- B. Left-Turn Analysis Worksheets
- C. Traffic Signal Warrant Analysis

- D. Crosswalk Assessments
- E. Railroad and Half Signal Visual Conflicts

Appendix A Map of Automatic Traffic Recorder Station Locations



Appendix B Left Turn Analysis Worksheets

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	₽		ሻ	₽		ሻ	ተ ኈ		ሻ	∱ ∱	
Traffic Volume (veh/h)	195	25	85	50	5	115	85	1235	185	170	635	80
Future Volume (veh/h)	195	25	85	50	5	115	85	1235	185	170	635	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	213	27	93	55	5	126	93	1352	203	186	695	88
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	76	261	70	7	166	120	1384	206	199	1555	197
Arrive On Green	0.14	0.20	0.20	0.04	0.11	0.10	0.07	0.45	0.44	0.11	0.49	0.48
Sat Flow, veh/h	1781	369	1272	1781	61	1533	1781	3103	462	1781	3173	401
Grp Volume(v), veh/h	213	0	120	55	0	131	93	769	786	186	389	394
Grp Sat Flow(s),veh/h/ln	1781	0	1641	1781	0	1594	1781	1777	1787	1781	1777	1798
Q Serve(g_s), s	9.5	0.0	5.1	2.5	0.0	6.5	4.1	34.1	35.1	8.4	11.5	11.6
Cycle Q Clear(g_c), s	9.5	0.0	5.1	2.5	0.0	6.5	4.1	34.1	35.1	8.4	11.5	11.6
Prop In Lane	1.00		0.77	1.00		0.96	1.00		0.26	1.00		0.22
Lane Grp Cap(c), veh/h	243	0	336	70	0	172	120	792	797	199	871	881
V/C Ratio(X)	0.88	0.00	0.36	0.78	0.00	0.76	0.77	0.97	0.99	0.94	0.45	0.45
Avail Cap(c_a), veh/h	243	0	447	154	0	356	221	792	797	199	871	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	0.0	27.7	38.4	0.0	35.2	37.0	21.8	22.2	35.6	13.4	13.5
Incr Delay (d2), s/veh	28.0	0.0	0.5	13.1	0.0	5.1	7.6	24.8	28.3	45.9	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	0.0	1.9	1.3	0.0	2.6	2.0	18.1	19.4	6.0	4.1	4.2
Unsig. Movement Delay, s/veh		0.0	28.2	E4 E	0.0	40.2	44.6	46.6	E0 E	04.4	10.7	12.0
LnGrp Delay(d),s/veh	62.2 E	0.0 A	26.2 C	51.5 D		40.3	44.6	46.6 D	50.5 D	81.4 F	13.7 B	13.8 B
LnGrp LOS	<u> </u>		U	U	A 400	D	D		U	Г		
Approach Vol, veh/h		333			186			1648			969	
Approach Delay, s/veh		49.9			43.6			48.3			26.7	
Approach LOS		D			D			D			С	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.4	43.6	15.0	12.7	13.0	40.0	7.2	20.5				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	10.0	35.0	11.0	18.0	9.0	36.0	7.0	22.0				
Max Q Clear Time (g_c+l1), s	6.1	13.6	11.5	8.5	10.4	37.1	4.5	7.1				
Green Ext Time (p_c), s	0.1	7.8	0.0	0.3	0.0	0.0	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			41.6									
HCM 6th LOS			D									

Intersection						
Int Delay, s/veh	38.1					
•	EBL	EBR	NBL	NBT	SBT	SBR
Movement Configurations		EDK				SDK
Lane Configurations	Y	70	`	^	↑ }	400
Traffic Vol, veh/h	270	70	45	1350	650	120
Future Vol, veh/h	270	70	45	1350	650	120
Conflicting Peds, #/hr		0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None		None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storag	e,# 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	296	77	49	1478	712	131
IVIVIIIL I IUW	230	11	43	1470	112	101
Major/Minor	Minor2	N	/lajor1	N	Major2	
Conflicting Flow All	1615	422	843	0		0
Stage 1	778	-	-	-	_	-
Stage 2	837	_	_	_	_	_
	6.84	6.94	4.14	-		
Critical Hdwy				-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 95	580	789	-	-	-
Stage 1	413	-		-	-	-
Stage 2	385	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 89	580	789	_	_	_
Mov Cap-2 Maneuver		-		_	_	_
Stage 1	387			_		
Stage 2	385	_	_	_	_	-
Slaye 2	303	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s			0.3		0	
HCM LOS	273.5 F		0.0		U	
I IOWI LOG	Г					
Minor Lane/Major Mvr	nt	NBL	NBT E	EBLn1	SBT	SBR
Capacity (veh/h)		789	-	249	-	_
HCM Lane V/C Ratio		0.062		1.495	_	<u>-</u>
HCM Control Delay (s	1	9.9		279.5	_	
HCM Lane LOS	7)					
	-\	A	-	F	-	-
HCM 95th %tile Q(veh	1)	0.2	-	21.8	-	-
Notes						
~: Volume exceeds ca	apacity	\$· De	av eve	eeds 30	00s	+: Comp
. Volume exceeds Co	μασιιγ	ψ. De	idy C AU	ceus su	.03	· . Comp

Interception								
Intersection Int Delay, s/veh	25.6							
• •								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations		7		^	Λ₽			
Traffic Vol, veh/h	270	70	45	1350	650	120		
Future Vol, veh/h	270	70	45	1350	650	120		
Conflicting Peds, #/hr	0	0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None	-	None	-	None		
Storage Length	0	0	75	-	-	-		
Veh in Median Storage	e, # 0	-	-	0	0	-		
Grade, %	0	-	-	0	0	-		
Peak Hour Factor	95	95	95	95	95	95		
Heavy Vehicles, %	2	2	2	2	2	2		
Mvmt Flow	296	77	49	1478	712	131		
Major/Minor	Minor2	N	Acior1		/loior?			
			Major1		Major2			
Conflicting Flow All	1615	422	843	0	-	0		
Stage 1	778	-	-	-	-	-		
Stage 2	837	-	-	-	-	-		
Critical Hdwy	6.84	6.94	4.14	-	-	-		
Critical Hdwy Stg 1	5.84	-	-	-	-	-		
Critical Hdwy Stg 2	5.84	-	-	-	-	-		
Follow-up Hdwy	3.52	3.32	2.22	-	-	-		
Pot Cap-1 Maneuver	~ 95	580	789	-	-	-		
Stage 1	413	-	-	-	-	-		
Stage 2	385	-	-	-	-	-		
Platoon blocked, %				-	-	-		
Mov Cap-1 Maneuver	~ 89	580	789	-	-	-		
Mov Cap-2 Maneuver		-	-	-	-	-		
Stage 1	387	-	-	-	-	-		
Stage 2	385	-	-	-	-	-		
Approach	EB		NB		SB			
HCM Control Delay, s			0.3		0			
HCM LOS	107.3 F		0.5		U			
I IOW LOG	Г							
Minor Lane/Major Mvm	nt	NBL	NBT	EBLn1 E	EBLn2	SBT	SBR	
Capacity (veh/h)		789	-	217	580	-	-	
HCM Lane V/C Ratio		0.062	-	1.362	0.132	-	-	
HCM Control Delay (s)		9.9	-	232.7	12.2	-	-	
HCM Lane LOS		Α	-	F	В	-	-	
HCM 95th %tile Q(veh)	0.2	-	16.5	0.5	-	-	
Notes								
	naoit.	ф. D-	lov ex-	00d= 00	100	0	utation Not Defined	*. All major valuma in alataca
~: Volume exceeds ca	pacity	a: De	iay exc	eeds 30	JUS -	+. Comp	outation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	6.6					
•		WED	NDT	NDD	CDI	CDT
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y	450	†	400	100	^
Traffic Vol, veh/h	35	150	1250	120	180	535
Future Vol, veh/h	35	150	1250	120	180	535
Conflicting Peds, #/hr		0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None				
Storage Length	0	-	-	-	75	-
Veh in Median Storag		-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	164	1368	131	197	586
M = : = =/M d:== = =	M:4		M-:4		4-:0	
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2121	750	0	0	1499	0
Stage 1	1434	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	43	354	-	-	443	-
Stage 1	186	-	-	-	-	-
Stage 2	461	_	_	_	_	-
Platoon blocked, %			_	_		_
Mov Cap-1 Maneuver	~ 24	354	_	_	443	_
Mov Cap-1 Maneuver		-	_	_	-	<u>-</u>
Stage 1	186	_			_	
•	256		-	-		
Stage 2	250	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	62.1		0		4.9	
HCM LOS	F					
110111 200	•					
Minor Lane/Major Mvr	mt	NBT	NBRV	VBLn1	SBL	SBT
Minor Lane/Major Mvr Capacity (veh/h)	mt	NBT -	NBRV -	<u>VBLn1</u> 248	SBL 443	SBT -
	mt	NBT -	-	248		
Capacity (veh/h) HCM Lane V/C Ratio		-	-	248 0.817	443 0.445	-
Capacity (veh/h)		-	-	248	443	-
Capacity (veh/h) HCM Lane V/C Ratio HCM Control Delay (s HCM Lane LOS	3)	- - -	- - -	248 0.817 62.1 F	443 0.445 19.5 C	- - -
Capacity (veh/h) HCM Lane V/C Ratio HCM Control Delay (s HCM Lane LOS HCM 95th %tile Q(vel	3)	- - -	- - -	248 0.817 62.1	443 0.445 19.5	- - -
Capacity (veh/h) HCM Lane V/C Ratio HCM Control Delay (s HCM Lane LOS	s) h)	-	- - -	248 0.817 62.1 F 6.3	443 0.445 19.5 C 2.2	- - -

Intersection								
Int Delay, s/veh	4							
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	• ነ	7	∱ ⊅		<u>ነ</u>	^		
Traffic Vol, veh/h	35	150	1250	120	180	535		
Future Vol, veh/h	35	150	1250	120	180	535		
Conflicting Peds, #/hr	0	0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None	-	None	-	None		
Storage Length	0	0	-	-	75	-		
Veh in Median Storag	e,# 0	-	0	-	-	0		
Grade, %	0	-	0	-	-	0		
Peak Hour Factor	95	95	95	95	95	95		
Heavy Vehicles, %	2	2	2	2	2	2		
Mvmt Flow	38	164	1368	131	197	586		
Major/Minor	Minor1	N	Major1	N	Major2			
	2121	750			1499	0		
Conflicting Flow All	1434		0	0				
Stage 1		-	-	-	-	-		
Stage 2	687 6.84	6.94	-	-	4.14	-		
Critical Hdwy	5.84		-	-		-		
Critical Hdwy Stg 1	5.84	-	-	_	-	-		
Critical Hdwy Stg 2		2 22	-	-	- 0.00	-		
Follow-up Hdwy	3.52	3.32	-	-	2.22	-		
Pot Cap-1 Maneuver	43	354	-	-	443	-		
Stage 1	186	-	-	-	-	-		
Stage 2	461	-	-	-	-	-		
Platoon blocked, %	. 04	254	-	-	4.40	-		
Mov Cap-1 Maneuver		354	-	-	443	-		
Mov Cap-2 Maneuver		-	-	-	-	-		
Stage 1	186	-	-	-	-	-		
Stage 2	256	-	-	-	-	-		
Approach	WB		NB		SB			
HCM Control Delay, s	29.6		0		4.9			
HCM LOS	D							
Minor Lane/Major Mvr	mt	NBT	NIPDV	VBLn1V	VRI 52	SBL	SBT	
	m		INDIXV					
Capacity (veh/h)		-	-	109	354	443	-	
HCM Control Doloy (-		0.352			-	
HCM Long LOS	<i>(</i>)	-	-	· · · · ·	23.7	19.5	-	
HCM Lane LOS	5)	-	-	F	C	C	-	
HCM 95th %tile Q(veh	n)	-	-	1.4	2.4	2.2	-	
Notes								
~: Volume exceeds ca	apacity	\$: De	lay exc	eeds 30)0s	+: Comp	utation Not Defined	*: All major volume in platoon
	1		,					.,

Intersection						
Int Delay, s/veh	2.9					
		14/5/5		NEE	001	00=
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		₽		7	^
Traffic Vol, veh/h	40	80	700	115	120	305
Future Vol, veh/h	40	80	700	115	120	305
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage	, # 0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	88	766	126	131	334
M = : = =/N A:== = =	\ 4:4		1-:1		4-:0	
	Minor1		//ajor1		Major2	
Conflicting Flow All	1258	829	0	0	892	0
Stage 1	829	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	175	370	-	-	758	-
Stage 1	428	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	145	370	-	-	758	-
Mov Cap-2 Maneuver	279	-	-	-	-	-
Stage 1	428	-	-	-	-	_
Stage 2	517	_	_	_	_	_
olago 2	0.7					
Approach	WB		NB		SB	
HCM Control Delay, s	22.6		0		3	
HCM LOS	С					
Minor Lane/Major Mvm	.+	NBT	NDDV	VBLn1	SBL	SBT
	ıı	NDI	INDIN			SDI
Capacity (veh/h)		-	-	334	758	-
HCM Control Doloy (a)		-	-	0.393		-
HCM Control Delay (s) HCM Lane LOS		-	-	22.6	10.7	-
HI MI AND I (1)S		-	-	С	В	-
HCM 95th %tile Q(veh)				1.8	0.6	-

Intersection							
Int Delay, s/veh	2.6						
		WED	NET	NDD	051	ODT	
Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations	<u>ነ</u>	7	\$	44=	- ነ	^	
Traffic Vol, veh/h	40	80	700	115	120	305	
Future Vol, veh/h	40	80	700	115	120	305	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	0	-	-	150	-	
Veh in Median Storag	e,# 0	-	0	-	-	0	
Grade, %	0	-	0	-	-	0	
Peak Hour Factor	95	95	95	95	95	95	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	44	88	766	126	131	334	
		_		_			
Major/Minor	Minor1		/lajor1		Major2		
Conflicting Flow All	1258	829	0	0	892	0	
Stage 1	829	-	-	-	-	-	
Stage 2	429	-	-	-	-	-	
Critical Hdwy	6.63	6.23	-	-	4.13	-	
Critical Hdwy Stg 1	5.43	-	-	-	-	-	
Critical Hdwy Stg 2	5.83	-	-	-	-	-	
Follow-up Hdwy	3.519	3.319	-	-	2.219	-	
Pot Cap-1 Maneuver	175	370	-	-	758	-	
Stage 1	428	-	-	-	-	-	
Stage 2	625	-	-	-	-	-	
Platoon blocked, %			-	-		-	
Mov Cap-1 Maneuver	145	370	_	-	758	_	
Mov Cap 1 Maneuver	279	-	_	_		_	
Stage 1	428	_	_	_	_	_	
Stage 2	517	<u>-</u>	_	_	_	_	
Olaye Z	517					_	
Approach	WB		NB		SB		
HCM Control Delay, s	18.6		0		3		
HCM LOS	С						
NA:	-4	NET	NDD	MDI 4V	VDL C	ODI	
Minor Lane/Major Mvr	nt	NBT		VBLn1V		SBL	
Capacity (veh/h)		-	-		370	758	
HCM Lane V/C Ratio		-	-	0.157			
HCM Control Delay (s)	-	-		17.7	10.7	
HCM Lane LOS		-	-	С	С	В	
HCM 95th %tile Q(veh	1)	-	-	0.5	0.9	0.6	
	•						

Intersection							
Int Delay, s/veh	62.4						
	EBL	EBR	NBL	NBT	CDT	SBR	Ī
Movement		EBK			SBT		
Lane Configurations	7	00	100	470	↑	470	
Traffic Vol, veh/h	345	90	180	470	175	170	
Future Vol, veh/h	345	90	180	470	175	170	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	-	175	-	-	0	
Veh in Median Storage	e, # 0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	95	95	95	95	95	95	
Heavy Vehicles, %	2	2	2	2	2	2	
Mymt Flow	378	99	197	515	192	186	
IVIVIIIL FIOW	310	99	191	313	132	100	
Major/Minor	Minor2	1	Major1	N	Major2		I
Conflicting Flow All	1101	192	378	0		0	
Stage 1	192	-	-	-	_	-	
Stage 2	909	_	_	_			
Critical Hdwy	6.42	6.22	4.12			_	
•			4.12				
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518		2.218	-	-	-	
Pot Cap-1 Maneuver	~ 235	850	1180	-	-	-	
Stage 1	841	-	-	-	-	-	
Stage 2	393	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	~ 196	850	1180	_	-	-	
Mov Cap-2 Maneuver		-		_	_	_	
Stage 1	701	_	_	_	_	_	
_	393		_				
Stage 2	393	-	-	-	-	-	
Approach	EB		NB		SB		
HCM Control Delay, s			2.4		0		
HCM LOS	Z01.0		۷.٦		U		
I IOIVI LOG	Г						
Minor Lane/Major Mvn	nt	NBL	NBT I	EBLn1	SBT	SBR	
Capacity (veh/h)		1180	_	355	_	_	
HCM Lane V/C Ratio		0.167	_	1.341	_	_	
HCM Control Delay (s))	8.7		201.6	_	_	
HCM Lane LOS)	Α	_	Z01.0		_	
	.\		-		-		
HCM 95th %tile Q(veh	1)	0.6	-	22.9	-	-	
Notes							
~: Volume exceeds ca	nacity	\$· Da	lav exc	eeds 30)Os -	+: Comp	١

Intersection									
Int Delay, s/veh	41								
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	ሻ	7	ř	<u></u>		7			
Traffic Vol, veh/h	345	90	180	470	175	170			
Future Vol, veh/h	345	90	180	470	175	170			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Stop	Stop	Free	Free	Free	Free			
RT Channelized	_	None	_	None	_	None			
Storage Length	0	0	175	-	_	0			
Veh in Median Storag		_	-	0	0	_			
Grade, %	0	_	-	0	0	_			
Peak Hour Factor	95	95	95	95	95	95			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	378	99	197	515	192	186			
	0.0			0.0					
N.A. ' (N.A.	N4: 0								
Major/Minor	Minor2		Major1		Major2				
Conflicting Flow All	1101	192	378	0	-	0			
Stage 1	192	-	-	-	-	-			
Stage 2	909	-	-	-	-	-			
Critical Hdwy	6.42	6.22	4.12	-	-	-			
Critical Hdwy Stg 1	5.42	-	-	-	-	-			
Critical Hdwy Stg 2	5.42	-	-	-	-	-			
Follow-up Hdwy	3.518	3.318	2.218	-	-	-			
Pot Cap-1 Maneuver	~ 235	850	1180	-	-	-			
Stage 1	841	-	-	-	-	-			
Stage 2	393	-	-	-	-	-			
Platoon blocked, %				-	-	-			
Mov Cap-1 Maneuver	~ 196	850	1180	-	-	-			
Mov Cap-2 Maneuver	~ 308	-	-	-	-	-			
Stage 1	701	-	-	-	-	-			
Stage 2	393	-	-	-	-	-			
Approach	EB		NB		SB				
HCM Control Delay, s			2.4		0				
HCM LOS	F		2.7		J				
TIOWI LOO	1								
Minor Lane/Major Mvr	nt	NBL	NBT	EBLn1 E		SBT	SBR		
Capacity (veh/h)		1180	-	308	850	-	-		
HCM Lane V/C Ratio		0.167		1.226		-	-		
HCM Control Delay (s	s)	8.7	-	162.7	9.8	-	-		
HCM Lane LOS		Α	-	F	Α	-	-		
HCM 95th %tile Q(veh	۱)	0.6	-	17	0.4	-	-		
Notes									
~: Volume exceeds ca	anacity	\$ Do	lav evo	eeds 30)Os	+· Comr	outation Not Defined	*: All major volume in platoon	
. Volume exceeds Co	pacity	ψ. De	nay ext	ceus Ju	103	· . Comp	atation Not Delineu	. All major volume in platoon	

Intersection														
Int Delay, s/veh	679.9													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		44			4		ች	1→			ĵ.			
Traffic Vol, veh/h	120	50	210	0	0	0	170	295	0	300	630	205		
Future Vol, veh/h	120	50	210	0	0	0	170	295	0	300	630	205		
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free		
RT Channelized	<u>-</u>	-	None	-	-	None	-	-	None	-	-	None		
Storage Length	_	-	-	-	-	-	100	_	_	100	-	-		
Veh in Median Storage	e.# -	0	_	-	0	-	-	0	_	-	0	_		
Grade, %	-,	0	-	-	0	-	_	0	-	_	0	_		
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95		
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2		
Mvmt Flow	131	55	230	0	0	0	186	323	0	328	690	224		
WWIIICTIOW	101	55	200	U	U	U	100	020	U	320	030	ZZT		
Major/Minor	Minor2			Minor1			Major1		ı	Major2				
Conflicting Flow All	2153	2153	802	2296	2265	323	914	0	0	323	0	0		
Stage 1	1458	1458	- 002		695	323	914	-	U	323	-	U		
•	695	695		1601					-			-		
Stage 2			6.00		1570	6.00	4 40	-	-	4 40	-	-		
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-		
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-		
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-		
Pot Cap-1 Maneuver	~ 35	~ 48	384	27	41	718	746	-	-	1237	-	-		
Stage 1	161	194	-	433	444	-	-	-	-	-	-	-		
Stage 2	433	444	-	133	171	-	-	-	-	-	-	-		
Platoon blocked, %								-	-		-	-		
Mov Cap-1 Maneuver	~ 23	~ 26	384	-	23	718	746	-	-	1237	-	-		
Mov Cap-2 Maneuver	~ 23	~ 26	-	-	23	-	-	-	-	-	-	-		
Stage 1	~ 121	143	-		333	-	-	-	-	-	-	-		
Stage 2	325	333	-	24	126	-	-	-	-	-	-	-		
Approach	EB			WB			NB			SB				
HCM Control Delay, \$	3530.2			0			4.2			2.4				
HCM LOS	F			Α										
Minor Lane/Major Mvm	nt	NBL	NBT		EBLn1\		SBL	SBT	SBR					
Capacity (veh/h)		746	-	-	49	-	1237	-	-					
HCM Lane V/C Ratio		0.249	-	-	8.49		0.265	-	-					
HCM Control Delay (s)		11.4	-	\$:	3530.2	0	9	-	-					
HCM Lane LOS		В	-	-	F	Α	Α	-	-					
HCM 95th %tile Q(veh)	1	-	-	49.1	-	1.1	-	-					
Notes														
~: Volume exceeds car	pacity	\$: De	elay exc	eeds 30	00s	+: Com	putation	Not De	fined	*: All r	najor v	olume ir	n platoon	

Intersection													
Int Delay, s/veh	264.2												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	*	î,		ሻ	î,			ĵ.			ĵ.		
Traffic Vol, veh/h	120	50	210	0	0	0	170	295	0	300	630	205	
Future Vol, veh/h	120	50	210	0	0	0	170	295	0	300	630	205	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	_	_	None	_	_	None	_	_	None	_	-	None	
Storage Length	0	_	-	0	_	-	100	-	-	100	-	-	
/eh in Median Storage	.# -	0	_	_	0	_	_	0	_	_	0	_	
Grade, %	-	0	_	_	0	_	_	0	_	_	0	_	
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	
leavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Nymt Flow	131	55	230	0	0	0	186	323	0	328	690	224	
VIVIIIL I IOW	101	55	230	U	U	U	100	323	U	320	030	224	
Major/Minor I	Minor2		ı	Minor1		- 1	Major1		ı	Major2			
Conflicting Flow All	2153	2153	802	2296	2265	323	914	0	0	323	0	0	
Stage 1	1458	1458	- 002	695	695	323	914		-	323	-	-	
	695	695		1601	1570	-	-	-	-	-		-	
Stage 2 Critical Hdwy			6.22			6.22	4.12		-	4.12	-	-	
•	7.12	6.52		7.12	6.52		4.12	-	-		-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
ollow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	~ 35	~ 48	384	27	41	718	746	-	-	1237	-	-	
Stage 1	161	194	-	433	444	-	-	-	-	-	-	-	
Stage 2	433	444	-	133	171	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	~ 23	~ 26	384	-	23	718	746	-	-	1237	-	-	
Mov Cap-2 Maneuver	~ 23	~ 26	-	-	23	-	-	-	-	-	-	-	
Stage 1	~ 121	143	-	325	333	-	-	-	-	-	-	-	
Stage 2	325	333	-	24	126	-	-	-	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, \$ 1	1364.4			0			4.2			2.4			
HCM LOS	F			Α									
Minor Lane/Major Mvm	ıt	NBL	NBT	NBR	EBLn1	EBLn2V	VBLn1V	VBLn2	SBL	SBT	SBR		
Capacity (veh/h)		746	-	_	23	105	-	-		-	-		
HCM Lane V/C Ratio		0.249	_	_	5.712		_		0.265	_	_		
HCM Control Delay (s)		11.4	_		2457\$		0	0	9	-	_		
HCM Lane LOS		В	_	_	, 2-107ψ F	F	A	A	A	_	_		
HCM 95th %tile Q(veh)		1	_	_	16.5	26.5	-	-	1.1	_	_		
·					13.0	25.5							
Notes	.,	Δ.5			20			NI CD	c .	4 41		, ,	
: Volume exceeds cap	pacity	\$: De	elay exc	eeds 30)Us -	+: Comp	outation	Not De	etined	*: All r	najor v	olume ir	n platoon

	۶	→	*	•	←	4	1	†	~	/	†	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	₽		ሻ	f)		7	ተ ኈ		7	∱ ∱	
Traffic Volume (veh/h)	115	20	100	160	30	185	105	665	105	230	1285	235
Future Volume (veh/h)	115	20	100	160	30	185	105	665	105	230	1285	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	126	22	109	175	33	203	115	728	115	252	1407	257
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	148	40	199	178	37	228	135	1176	186	282	1400	252
Arrive On Green	0.08	0.15	0.15	0.10	0.16	0.16	0.08	0.38	0.38	0.16	0.47	0.47
Sat Flow, veh/h	1781	273	1354	1781	226	1393	1781	3074	485	1781	3009	541
Grp Volume(v), veh/h	126	0	131	175	0	236	115	421	422	252	822	842
Grp Sat Flow(s),veh/h/ln	1781	0	1627	1781	0	1620	1781	1777	1783	1781	1777	1773
Q Serve(g_s), s	5.9	0.0	6.3	8.3	0.0	12.1	5.4	16.3	16.3	11.8	39.1	39.5
Cycle Q Clear(g_c), s	5.9	0.0	6.3	8.3	0.0	12.1	5.4	16.3	16.3	11.8	39.1	39.5
Prop In Lane	1.00		0.83	1.00		0.86	1.00		0.27	1.00		0.31
Lane Grp Cap(c), veh/h	148	0	239	178	0	266	135	680	682	282	827	825
V/C Ratio(X)	0.85	0.00	0.55	0.98	0.00	0.89	0.85	0.62	0.62	0.89	0.99	1.02
Avail Cap(c_a), veh/h	178	0	335	178	0	334	136	680	682	325	827	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	0.0	33.6	38.1	0.0	34.7	38.8	21.2	21.2	35.0	22.6	22.7
Incr Delay (d2), s/veh	25.6	0.0	1.5	61.6	0.0	19.7	36.8	1.5	1.5	22.6	29.8	36.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	2.5	6.5	0.0	5.9	3.7	6.6	6.6	6.6	21.0	22.7
Unsig. Movement Delay, s/veh		0.0	25.4	00.7	0.0	545	75.5	00.7	00.7	F7 7	E0.0	FO 4
LnGrp Delay(d),s/veh	64.0	0.0	35.1	99.7	0.0	54.5	75.5	22.7	22.7	57.7	52.3 D	59.4
LnGrp LOS	<u>E</u>	A	D	F	A 444	D	<u>E</u>	C	С	<u>E</u>		F
Approach Vol, veh/h		257			411			958			1916	
Approach Delay, s/veh		49.2			73.7			29.1			56.1	
Approach LOS		D			E			С			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.9	44.0	11.6	18.4	17.9	37.0	13.0	17.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	7.0	40.0	9.0	18.0	16.0	31.0	9.0	18.0				
Max Q Clear Time (g_c+l1), s	7.4	41.5	7.9	14.1	13.8	18.3	10.3	8.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.3	0.2	6.5	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			50.4									
HCM 6th LOS			D									

	۶	→	*	•	←	4	1	†	~	/	†	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	₽		ሻ	f)		7	ተ ኈ		7	∱ ∱	
Traffic Volume (veh/h)	115	20	100	160	30	185	105	665	105	230	1285	235
Future Volume (veh/h)	115	20	100	160	30	185	105	665	105	230	1285	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	126	22	109	175	33	203	115	728	115	252	1407	257
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	148	40	199	178	37	228	135	1176	186	282	1400	252
Arrive On Green	0.08	0.15	0.15	0.10	0.16	0.16	0.08	0.38	0.38	0.16	0.47	0.47
Sat Flow, veh/h	1781	273	1354	1781	226	1393	1781	3074	485	1781	3009	541
Grp Volume(v), veh/h	126	0	131	175	0	236	115	421	422	252	822	842
Grp Sat Flow(s),veh/h/ln	1781	0	1627	1781	0	1620	1781	1777	1783	1781	1777	1773
Q Serve(g_s), s	5.9	0.0	6.3	8.3	0.0	12.1	5.4	16.3	16.3	11.8	39.1	39.5
Cycle Q Clear(g_c), s	5.9	0.0	6.3	8.3	0.0	12.1	5.4	16.3	16.3	11.8	39.1	39.5
Prop In Lane	1.00		0.83	1.00		0.86	1.00		0.27	1.00		0.31
Lane Grp Cap(c), veh/h	148	0	239	178	0	266	135	680	682	282	827	825
V/C Ratio(X)	0.85	0.00	0.55	0.98	0.00	0.89	0.85	0.62	0.62	0.89	0.99	1.02
Avail Cap(c_a), veh/h	178	0	335	178	0	334	136	680	682	325	827	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	0.0	33.6	38.1	0.0	34.7	38.8	21.2	21.2	35.0	22.6	22.7
Incr Delay (d2), s/veh	25.6	0.0	1.5	61.6	0.0	19.7	36.8	1.5	1.5	22.6	29.8	36.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	2.5	6.5	0.0	5.9	3.7	6.6	6.6	6.6	21.0	22.7
Unsig. Movement Delay, s/veh		0.0	25.4	00.7	0.0	545	75.5	00.7	00.7	F7 7	E0.0	FO 4
LnGrp Delay(d),s/veh	64.0	0.0	35.1	99.7	0.0	54.5	75.5	22.7	22.7	57.7	52.3 D	59.4
LnGrp LOS	<u>E</u>	A	D	F	A 444	D	<u>E</u>	C	С	<u>E</u>		F
Approach Vol, veh/h		257			411			958			1916	
Approach Delay, s/veh		49.2			73.7			29.1			56.1	
Approach LOS		D			E			С			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.9	44.0	11.6	18.4	17.9	37.0	13.0	17.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	7.0	40.0	9.0	18.0	16.0	31.0	9.0	18.0				
Max Q Clear Time (g_c+l1), s	7.4	41.5	7.9	14.1	13.8	18.3	10.3	8.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.3	0.2	6.5	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			50.4									
HCM 6th LOS			D									

Intersection								
Int Delay, s/veh	107.5							
		EDD	NDI	NDT	CDT	CDD		
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	210	110	أ	^	↑ ↑	275		
Traffic Vol, veh/h	210		90	905	1300	275		
Future Vol, veh/h	210	110	90	905	1300	275 0		
Conflicting Peds, #/hr				Free	Free	Free		
Sign Control RT Channelized	Stop	Stop None	Free -	None	Free -			
Storage Length	0	None -	- 75	none -	<u>-</u>	ivone -		
Veh in Median Storag		-	75	0	0			
Grade, %	e, # 0 0	-	-	0	0	-		
Peak Hour Factor	95	95	95	95	95	95		
Heavy Vehicles, %	2	2	2	2	2	2		
Mymt Flow	230	120	99	991	1423	301		
IVIVIIIL FIUW	230	120	99	331	1423	301		
Major/Minor	Minor2	N	//ajor1	N	//ajor2			
Conflicting Flow All	2268	862	1724	0	-	0		
Stage 1	1574	-	-	-	-	-		
Stage 2	694	-	-	-	-	-		
Critical Hdwy	6.84	6.94	4.14	-	-	-		
Critical Hdwy Stg 1	5.84	-	-	-	-	-		
Critical Hdwy Stg 2	5.84	-	-	-	-	-		
Follow-up Hdwy	3.52	3.32	2.22	-	-	-		
Pot Cap-1 Maneuver	~ 34	298	363	-	-	-		
Stage 1	~ 156	-	-	-	-	-		
Stage 2	457	-	-	-	-	-		
Platoon blocked, %				-	-	-		
Mov Cap-1 Maneuver	~ 25	298	363	-	-	-		
Mov Cap-2 Maneuver	~ 90	-	-	-	-	-		
Stage 1	~ 113	-	-	-	-	-		
Stage 2	457	-	-	-	-	-		
Approach	EB		NB		SB			
			1.7					
HCM Control Delay, s			1.7		0			
HCM LOS	F							
Minor Lane/Major Mvi	mt	NBL	NBT I	EBLn1	SBT	SBR		
Capacity (veh/h)		363	-		-	-		
HCM Lane V/C Ratio		0.271	-	2.969	-	-		
HCM Control Delay (s	s)	18.6		965.3	-	_		
HCM Lane LOS	,	С	-	F	-	-		
HCM 95th %tile Q(vel	h)	1.1	-		-	-		
	,							
Notes		Φ.5			\ <u>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</u>			
~: Volume exceeds ca	apacity	\$: De	lay exc	eeds 30)US	+: Comp	outation Not Defined	*:

Intersection								
Int Delay, s/veh	60							
•								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	ሻ	7		^	♦ ₽			
Traffic Vol, veh/h	210	110	90	905	1300	275		
Future Vol, veh/h	210	110	90	905	1300	275		
Conflicting Peds, #/hr	0	0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None	-	None	-	None		
Storage Length	0	0	75	-	-	-		
Veh in Median Storage		-	-	0	0	-		
Grade, %	0	-	-	0	0	-		
Peak Hour Factor	95	95	95	95	95	95		
Heavy Vehicles, %	2	2	2	2	2	2		
Mvmt Flow	230	120	99	991	1423	301		
Major/Minor	Minor2	ı	Major1	N	Major2			
Conflicting Flow All	2268		1724	0	- viajoiz	0		
Stage 1	1574	-	-	-	_	-		
Stage 2	694	_	_	_	<u>-</u>	_		
Critical Hdwy	6.84	6.94	4.14	_	_	_		
Critical Hdwy Stg 1	5.84	0.54	4.14	-	_	_		
	5.84	-	-		-	-		
Critical Hdwy Stg 2	3.52	3.32	2.22	-				
Follow-up Hdwy	~ 34	298	363	-	-	-		
Pot Cap-1 Maneuver			303	-	-	-		
Stage 1	~ 156	-	-	-	-	-		
Stage 2	457	-	-	-	-	-		
Platoon blocked, %	٥٢	000	202	-	-	-		
Mov Cap-1 Maneuver		298	363	-	-	-		
Mov Cap-2 Maneuver	~ 90	-	-	-	-	-		
Stage 1	~ 113	-	-	-	-	-		
Stage 2	457	-	-	-	-	-		
Approach	EB		NB		SB			
HCM Control Delay, s	\$ 536.9		1.7		0			
HCM LOS	F							
	•							
Minor Lane/Major Mvn	nt	NBL	NRT	EBLn1 E	-Bl n2	SBT	SBR	
Capacity (veh/h)		363	-	90	298	-	-	
HCM Lane V/C Ratio		0.271		2.554		_	<u>-</u>	
HCM Control Delay (s)	١	18.6		\$ 805	25	-	-	
HCM Lane LOS)	10.0 C	-	φ ουσ F	25 D			
	.\	1.1	-			-	-	
HCM 95th %tile Q(veh	I)	1.1	-	21.5	1.9	-	-	
Votes								
~: Volume exceeds ca	pacity	\$: De	lay exc	eeds 30)0s	+: Comp	utation Not Defined	*: All major volume in platoon

Intersection								
Int Delay, s/veh	38.1							
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
ane Configurations	**		∱ }		ሻ	^		
Fraffic Vol, veh/h	135	230	735	60	180	1225		
uture Vol, veh/h	135	230	735	60	180	1225		
Conflicting Peds, #/hr	0	0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None	-	None	-			
Storage Length	0	-	_	-	75	-		
eh in Median Storage		_	0	_	-	0		
Grade, %	0, # 0	_	0	_	<u>-</u>	0		
Peak Hour Factor	95	95	95	95	95	95		
leavy Vehicles, %	2	2	2	2	2	2		
Ivmt Flow	148	252	805	66	197	1341		
/ivmt Flow	140	252	605	00	197	1341		
lajor/Minor	Minor1	N	Major1		Major2			
	1903	436	0	0	871	0		
onflicting Flow All Stage 1	838	430		U	0/1			
•			-			-		
Stage 2	1065	6.04	-	-	111	-		
ritical Hdwy	6.84	6.94	-	-	4.14	-		
ritical Hdwy Stg 1	5.84	-	-	-	-	-		
ritical Hdwy Stg 2	5.84	-	-	-	-	-		
ollow-up Hdwy	3.52	3.32	-	-	2.22	-		
ot Cap-1 Maneuver	~ 61	568	-	-	770	-		
Stage 1	385	-	-	-	-	-		
Stage 2	292	-	-	-	-	-		
Platoon blocked, %			-	-		-		
Nov Cap-1 Maneuver		568	-	-	770	-		
lov Cap-2 Maneuver		-	-	-	-	-		
Stage 1	385	-	-	-	-	-		
Stage 2	217	-	-	-	-	-		
Approach	WB		NB		SB			
ICM Control Delay, s			0		1.4			
ICM LOS	F							
Minor Lane/Major Mvn	nt	NBT	NBRV	VBLn1	SBL	SBT		
capacity (veh/h)		_	_	273	770	_		
CM Lane V/C Ratio		_	_			-		
ICM Control Delay (s))	_	_	262.4	11.3	-		
CM Lane LOS	1	-	_	Z0Z.4	11.3 B	_		
CM 95th %tile Q(veh	1)	_	_	22.5	1			
	'/			22.3	<u> </u>	_		
otes								
: Volume exceeds ca	pacity	\$: De	lay exc	eeds 30	00s	+: Comp	outation Not Defined	*: All major volume in platoon

Intersection								
Int Delay, s/veh	9.6							
		WDD	NDT	NDD	CDI	CDT		
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	105	7	↑ ↑	00	\	^		
Fraffic Vol, veh/h	135	230	735	60	180	1225		
uture Vol, veh/h	135	230	735	60	180	1225		
Conflicting Peds, #/hr		0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None	-	None	-	None		
Storage Length	0	0	-	-	75	-		
/eh in Median Storag		-	0	-	-	0		
Grade, %	0	-	0	-	-	0		
Peak Hour Factor	95	95	95	95	95	95		
Heavy Vehicles, %	2	2	2	2	2	2		
Mvmt Flow	148	252	805	66	197	1341		
Major/Minor	Minor1	N	Major1	N	/lajor2			
Conflicting Flow All	1903	436	0	0	871	0		
Stage 1	838	430	-	-	-	-		
Stage 2	1065	_	_	_	_	_		
Critical Hdwy	6.84	6.94	_		4.14	_		
Critical Hdwy Stg 1	5.84	0.34	_	_	4.14	_		
	5.84		-	-	-			
Critical Hdwy Stg 2	3.52	3.32	-	-	2.22	-		
Follow-up Hdwy Pot Cap-1 Maneuver	3.52 ~ 61	568	-	_	770	-		
•			-	-	110	-		
Stage 1	385	-	-	-	-	-		
Stage 2	292	-	-	-	-	-		
Platoon blocked, %	. 45	ECO	-	-	770	-		
Mov Cap-1 Maneuve		568	-	-	770	-		
Mov Cap-2 Maneuve		-	-	-	-	-		
Stage 1	385	-	-	-	-	-		
Stage 2	217	-	-	-	-	-		
Approach	WB		NB		SB			
HCM Control Delay,	62.4		0		1.4			
HCM LOS	F							
Minor Lane/Major Mv	mt	NBT	NRRV	VBLn1V	/RI n2	SBL	SBT	
Capacity (veh/h)			ושוו	145	568	770	-	
Capacity (ven/n) CM Lane V/C Ratio		-	-	1.019		0.256		
		-					-	
HCM Control Delay (5)	-	-	141	16.3	11.3	-	
HCM Lane LOS	h)	-	-	F 7.6	C	В	-	
HCM 95th %tile Q(ve	11)	-	-	7.6	2.3	1	-	
Votes								
: Volume exceeds c	apacity	\$: De	lay exc	eeds 30	00s	+: Comp	utation Not Defined	*: All major volume in platoon

Intersection								
Int Delay, s/veh	40.7							
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
	WBL	WDR		NDK	ODL Š			
Lane Configurations		000	♣	Ε0.		^		
Traffic Vol, veh/h	100	220	895	50	175	650		
Future Vol, veh/h	100	220	895	50	175	650		
Conflicting Peds, #/hr	0	0	0	_ 0	_ 0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None	-	None	-	None		
Storage Length	0	-	-	-	150	-		
Veh in Median Storage	e, # 0	-	0	-	-	0		
Grade, %	0	-	0	-	-	0		
Peak Hour Factor	95	95	95	95	95	95		
Heavy Vehicles, %	2	2	2	2	2	2		
Mymt Flow	109	241	980	55	192	712		
IVIVIIIL I IUW	109	Z 4 I	300	55	132	7 12		
Major/Minor	Minor1	N	Major1	1	Major2			
Conflicting Flow All	1748	1008	0	0	1035	0		
Stage 1	1008	_	_	_	_	_		
Stage 2	740	_	_	_	_	_		
Critical Hdwy	6.63	6.23	_	_	4.13	_		
•	5.43	0.23		_				
Critical Hdwy Stg 1			-	_	-	-		
Critical Hdwy Stg 2	5.83	-	-	-	-	-		
Follow-up Hdwy	3.519	3.319	-	-	2.219	-		
Pot Cap-1 Maneuver	~ 85	291	-	-	669	-		
Stage 1	352	-	-	-	-	-		
Stage 2	434	-	-	-	-	-		
Platoon blocked, %			-	-		-		
Mov Cap-1 Maneuver	~ 61	291	_	-	669	-		
Mov Cap-2 Maneuver	178	-	_	_	-	_		
Stage 1	352	_	_	_	_	_		
_	309			_		_		
Stage 2	309	-	-	-	-			
Approach	WB		NB		SB			
HCM Control Delay, s			0		2.7			
HCM LOS	F		U		2.1			
TICIVI LOS	ı							
Minor Lane/Major Mvn	nt	NBT	NBRV	VBLn1	SBL	SBT		
Capacity (veh/h)		_	_	243	669	_		
HCM Lane V/C Ratio		_	_	1.442		-		
HCM Control Delay (s)	١	_		258.8	12.5	-		
HCM Lane LOS		_		230.0 F	12.3 B	_		
		<u>-</u>	<u>-</u>	20	1.2			
HCM 95th %tile Q(veh)	-	-	20	1.2	-		
Notes							j	
	nacity	\$· Da	lav exc	eeds 30	າກຣ	+: Comr)	utation Not Defined
~: Volume exceeds ca								diametrica

Intersection								
Int Delay, s/veh	9.6							
		WDD	NDT	NDD	CDI	CDT		
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	\	7	}	50	475	^		
Fraffic Vol, veh/h	100	220	895	50	175	650		
uture Vol, veh/h	100	220	895	50	175	650		
Conflicting Peds, #/hr		0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None	-	None	-	None		
Storage Length	0	0	-	-	150	-		
eh in Median Storag		-	0	-	-	0		
Grade, %	0	-	0	-	-	0		
Peak Hour Factor	95	95	95	95	95	95		
Heavy Vehicles, %	2	2	2	2	2	2		
//vmt Flow	109	241	980	55	192	712		
Asiar/Minor	Minor1	N	Jaior1		Majora			
Major/Minor			Major1		Major2			
Conflicting Flow All	1748	1008	0	0	1035	0		
Stage 1	1008	-	-	-	-	-		
Stage 2	740	-	-	-	-	-		
ritical Hdwy	6.63	6.23	-	-	4.13	-		
Critical Hdwy Stg 1	5.43	-	-	-	-	-		
Critical Hdwy Stg 2	5.83	-	-	-	-	-		
ollow-up Hdwy	3.519		-	-	2.219	-		
ot Cap-1 Maneuver	~ 85	291	-	-	669	-		
Stage 1	352	-	-	-	-	-		
Stage 2	434	-	-	-	-	-		
Platoon blocked, %			-	-		-		
Mov Cap-1 Maneuver	~ 61	291	-	-	669	-		
Mov Cap-2 Maneuver		-	-	-	-	-		
Stage 1	352	-	-	-	-	-		
Stage 2	309	_	-	-	_	-		
	200							
	14/5							
Approach	WB		NB		SB			
HCM Control Delay, s			0		2.7			
HCM LOS	F							
Minor Lane/Major Mvr	mt	NBT	NRRV	VBLn1V	VRI n2	SBL	SBT	
	TIL.		אוטויי					
Capacity (veh/h)		-	-	178	291	669	-	
HCM Central Delay (a	.\	-		0.615		0.286	-	
HCM Control Delay (s	5)	-	-		56.8	12.5	-	
ICM Lane LOS		-	-	F	F	В	-	
HCM 95th %tile Q(vel	1)	-	-	3.4	6.9	1.2	-	
lotes								
: Volume exceeds ca	anacity	\$· Da	lav evo	eeds 30)0s	+. Comp	outation Not Defined	*: All major volume in platoon
. Volumo GAGGGGS G	paorty	ψ. De	idy CAU	ocus ot	700	· . Comp	atation Not Delined	. All major volume in piatoon

Intersection								
Int Delay, s/veh	31.9							
		E0.5	NE	NET	057	055		
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	7	400	105	↑	100	7		
Traffic Vol, veh/h	235	180	195	285	420	375		
Future Vol, veh/h	235	180	195	285	420	375		
Conflicting Peds, #/hr		0	0	0	0	0		
Sign Control	Stop	Stop	Free	Free	Free	Free		
RT Channelized	-	None		None	-			
Storage Length	0	-	175	-	-	0		
Veh in Median Storag		-	-	0	0	-		
Grade, %	0	-	-	0	0	- 0E		
Peak Hour Factor	95	95	95	95	95	95		
Heavy Vehicles, %	2	2	2	2	2	2		
Mvmt Flow	247	189	205	300	442	395		
Major/Minor	Minor2		Major1	Λ	/lajor2			J
Conflicting Flow All	1152	442	837	0		0		
Stage 1	442	_	-	-	-	-		
Stage 2	710	-	-	-	-	-		
Critical Hdwy	6.42	6.22	4.12	-	-	-		
Critical Hdwy Stg 1	5.42	-		-	_	-		
Critical Hdwy Stg 2	5.42	-	_	-	_	_		
Follow-up Hdwy		3.318	2.218	_	_	_		
Pot Cap-1 Maneuver	~ 219	615	797	-	-	-		
Stage 1	648	-		_	_	_		
Stage 2	487	-	_	-	-	-		
Platoon blocked, %				_	_	_		
Mov Cap-1 Maneuver	~ 163	615	797	-	-	_		
Mov Cap - Maneuver		-	-	_	_	_		
Stage 1	481	_	-	_	-	_		
Stage 2	487	_	_	_	_	<u>-</u>		
010g0 2	407							
Approach	EB		NB		SB			
HCM Control Delay, s			4.5		0			
HCM LOS	F							
Minor Lane/Major Mvi	mt	NBL	NRT	EBLn1	SBT	SBR		
Capacity (veh/h)	TIC .	797	-			אומט		
HCM Lane V/C Ratio		0.258		1.147	-	-		
	.\	11.1		124.6	-	-		
HCM Control Delay (s HCM Lane LOS	7)				-	-		
HCM 95th %tile Q(vel	2)	B 1	-	F 16.8	-	-		
HOW SOUT WHIE Q(VE	IJ	1	-	10.0	-	-		
Notes								
~: Volume exceeds ca	apacity	\$: De	elay exc	eeds 30	00s	+: Comp	utation Not Defined	*

Intersection									
Int Delay, s/veh	10.7								
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	- 1	7	7	†	•	7			
Traffic Vol, veh/h	235	180	195	285	420	375			
Future Vol, veh/h	235	180	195	285	420	375			
Conflicting Peds, #/hr		0	0	0	0	0			
Sign Control	Stop	Stop	Free	Free	Free	Free			
RT Channelized	-	None	_	None	-	None			
Storage Length	0	0	175	-	_	0			
Veh in Median Storag			-	0	0	-			
Grade, %	0	_	_	0	0	_			
Peak Hour Factor	95	95	95	95	95	95			
Heavy Vehicles, %	2	2	2	2	2	2			
Mymt Flow	247	189	205	300	442	395			
IVIVIII(I IOW	271	103	200	300	772	333			
Major/Minor	Minor2	ı	Major1	ľ	Major2				
Conflicting Flow All	1152	442	837	0	-	0			
Stage 1	442	-	-	-	-	-			
Stage 2	710	-	-	-	_	-			
Critical Hdwy	6.42	6.22	4.12	_	-	-			
Critical Hdwy Stg 1	5.42	-	-	_	_	_			
Critical Hdwy Stg 2	5.42	_	_	_	_	_			
Follow-up Hdwy		3.318	2 218	_	_	_			
Pot Cap-1 Maneuver	~ 219	615	797	_	_	_			
Stage 1	648	-	-	_	_	_			
Stage 2	487	_		_	_	_			
Platoon blocked, %	401			_	<u> </u>	_			
Mov Cap-1 Maneuver	~ 163	615	797	-	_	_			
Mov Cap-1 Maneuver		013	131	_	_	_			
	481		_	-		-			
Stage 1	487	-	-	-	-				
Stage 2	407	-	-	-	-	-			
Approach	EB		NB		SB				
HCM Control Delay, s	38.5		4.5		0				
HCM LOS	E		1.0						
Minor Lane/Major Mvi	nt	NBL	NBT	EBLn1 I		SBT	SBR		
Capacity (veh/h)		797	-	295	615	-	-		
HCM Lane V/C Ratio		0.258	-	0.839	0.308	-	-		
HCM Control Delay (s	s)	11.1	-	57.8	13.4	-	-		
HCM Lane LOS		В	-	F	В	-	-		
HCM 95th %tile Q(vel	1)	1	-	7.1	1.3	-	-		
`									
Notes		Δ.5			20		1 (C. N. 1 D. C. 1	* 41	
~: Volume exceeds ca	apacity	\$: De	lay exc	eeds 30	JUS	+: Comp	utation Not Defined	*: All major volume in platoon	

Left-Turn Lane Warrant Analysis

Project #: 23021.002

Project Name: TV Trail Concept Plan

Analyst: SSS

Intersection: Blanton EB between 185th and 170th

Scenario: 5:00 PM - 6:00 PM

Date: 4/9/2021

KITTELSON & ASSOCIATES, INC.

610 SW Alder, Suite 700 Portland, Oregon 97205

(503) 228-5230 Fax: (503) 273-8169

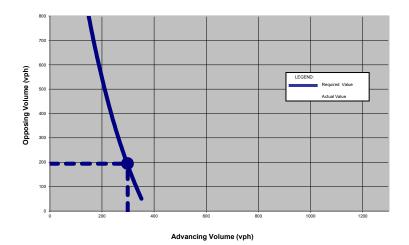
Input Data:

Advancing Volume (vph) = 298
Left-turning Vehicles (vph) = 95
Opposing Volume (vph) = 194
Speed (mph) = 25

Number of Approach Lanes = 1 (not applicable for two lanes)

% Left-Turning Vehicles 32%
Critical Gap (sec) = 5
Maneuver Time (sec) = 3
Exit Time (sec) = 1.9
Utilization Factor = 0.02

Left-Turn Lane Warrant Analysis Results



^{*} Based on Volume Warrants for Left-Turn Storage Lanes at Unsignalized Grade Intersections (D. Harmelink)

Left-Turn Lane Warrant Analysis

Project #: 23021.002

Project Name: TV Trail Concept Plan

Analyst: SSS

Intersection: Blanton WB between 185th and 170th

Scenario: 5:00 PM - 6:00 PM

Date: 4/9/2021



KITTELSON & ASSOCIATES, INC.

610 SW Alder, Suite 700 Portland, Oregon 97205

(503) 228-5230 Fax: (503) 273-8169

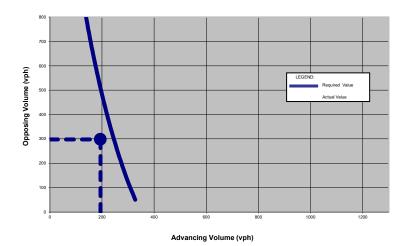
Input Data:

Advancing Volume (vph) = 194
Left-turning Vehicles (vph) = 95
Opposing Volume (vph) = 298
Speed (mph) = 25

Number of Approach Lanes = 1 (not applicable for two lanes)

% Left-Turning Vehicles 49%
Critical Gap (sec) = 5
Maneuver Time (sec) = 3
Exit Time (sec) = 1.9
Utilization Factor = 0.02

Left-Turn Lane Warrant Analysis Results



^{*} Based on Volume Warrants for Left-Turn Storage Lanes at Unsignalized Grade Intersections (D. Harmelink)

Appendix C Traffic Signal Warrant Analysis

Based on 2009 Edition of the MUTCD

Project #: 23021.002

Project Name: TV Trail Concept Plan

Analyst: NHG
Date: 3/9/2021

Intersection: Blanton Street/160th Avenue

Scenario: 2021 Existing Conditions

Volume Adjustment Factor = 1.0 North-South Approach = Major Minor East-West Approach = Major Street Thru Lanes = 1 Minor Street Thru Lanes = 1 Speed > 40 mph? No Population < 10,000? No **Warrant Factor** 100% Peak Hour or Daily Count? Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Highest	Yes	No
#2	Four-Hour	Yes	No
#3	Peak Hour	Yes	No

Select Type Of Major Street Approach From Dropdown Menu Select Type Of Minor Street Approach From Dropdown Menu Urban Minor Arterial
Rural Minor Collector

Note: traffic volume profile for weekday (if weekend is desired, tab "vol profile" needs to be adjusted)

Traffic Volumes Hour Major Street Minor Street Major St. Minor St. Adj. Factor Adj. Factor Begin End NB SB ΕB WB 4:40 PM 5:40 PM 164 453 1.00 1.00 60 90 2nd Highest Hour 429 71 0.95 0.79 155 48 3rd Highest Hour 153 423 45 67 0.93 0.75 4th Highest Hour 60 0.89 0.66 147 405 40 5th Highest Hour 144 399 37 56 0.88 0.62 6th Highest Hour 51 0.88 144 399 34 0.57 7th Highest Hour 138 381 34 50 0.84 0.56 8th Highest Hour 136 374 31 47 0.83 0.52 47 0.52 9th Highest Hour 362 31 0.80 131 10th Highest Hour 122 338 31 46 0.75 0.51 11th Highest Hour 27 0.72 118 326 41 0.46 12th Highest Hour 116 320 26 40 0.71 0.44 13th Highest Hour 112 308 21 32 0.68 0.36 14th Highest Hour 0.59 0.35 96 266 21 31 15th Highest Hour 77 211 20 29 0.47 0.33 16th Highest Hour 72 29 0.32 199 19 0.44 17th Highest Hour 17 0.31 0.19 50 139 11 18th Highest Hour 42 115 11 17 0.25 0.19 19th Highest Hour 22 60 7 0.13 0.07 20th Highest Hour 15 42 0.09 0.06 21st Highest Hour 13 36 3 0.08 0.04 2 22nd Highest Hour 9 24 1 1 0.05 0.01 23rd Highest Hour 12 0.03 0.01 24th Highest Hour 12 0.03 0.01

Based on 2009 Edition of the MUTCD

Project #: 23021.002

Project Name: TV Trail Concept Plan

Analyst: NHG
Date: 3/9/2021

Intersection: Blanton Street/185th Avenue (north)

Scenario: 2021 Existing Conditions

Volume Adjustment Factor = 1.0 North-South Approach = Major Minor East-West Approach = Major Street Thru Lanes = 1 Minor Street Thru Lanes = 1 Speed > 40 mph? No Population < 10,000? No **Warrant Factor** 100% Peak Hour or Daily Count? Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Highest	Yes	No
#2	Four-Hour	Yes	No
#3	Peak Hour	Yes	No

Select Type Of Major Street Approach From Dropdown Menu Select Type Of Minor Street Approach From Dropdown Menu Urban Minor Arterial
Rural Minor Collector

Note: traffic volume profile for weekday (if weekend is desired, tab "vol profile" needs to be adjusted)

Traffic Volumes Hour Major Street Minor Street Major St. Minor St. Adj. Factor Adj. Factor Begin End NB SB ΕB WB 4:30 PM 5:30 PM 723 924 1.00 1.00 85 0 2nd Highest Hour 684 875 0.95 0.79 68 0 3rd Highest Hour 675 862 0.93 0.75 4th Highest Hour 0.89 0.66 646 825 56 0 5th Highest Hour 636 813 52 0 0.88 0.62 6th Highest Hour 0.88 636 813 48 0.57 7th Highest Hour 607 776 48 0.84 0.56 0 8th Highest Hour 598 764 44 0 0.83 0.52 0.80 0.52 9th Highest Hour 578 739 44 0 10th Highest Hour 540 690 44 0 0.75 0.51 11th Highest Hour 521 39 0.72 665 0 0.46 12th Highest Hour 511 653 37 0 0.71 0.44 13th Highest Hour 492 30 0.68 0.36 14th Highest Hour 424 0.59 0.35 542 29 0 15th Highest Hour 337 431 28 0 0.47 0.33 16th Highest Hour 407 27 0.32 318 0 0.44 17th Highest Hour 222 0.31 0.19 283 16 0 18th Highest Hour 183 234 16 0 0.25 0.19 19th Highest Hour 96 123 0.13 0.07 0 20th Highest Hour 86 0.09 0.06 21st Highest Hour 58 74 0 0.08 0.04 22nd Highest Hour 39 49 1 0 0.05 0.01 23rd Highest Hour 19 25 0.03 0.01 24th Highest Hour 19 25 0.03 0.01

Based on 2009 Edition of the MUTCD

Project #: 23021.002

Project Name: TV Trail Concept Plan

Analyst: NHG

Date: 3/9/2021

Intersection: Blanton Street/185 Avenue (Realigned)

Scenario: 2021 Intersection Realignment

Volume Adjustment Factor = 1.0 North-South Approach = Major East-West Approach = Minor Major Street Thru Lanes = 1 Minor Street Thru Lanes = 1 Speed > 40 mph? No Population < 10,000? No **Warrant Factor** 100% Peak Hour or Daily Count? Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?	
#1	Eight-Highest	Yes	No	
#2	Four-Hour	Yes	Yes	
#3	Peak Hour	Yes	Yes	

*This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Select Type Of Major Street Approach From Dropdown Menu

Urban Minor Arterial
Rural Minor Collector

Select Type Of Minor Street Approach From Dropdown Menu

Note: traffic volume profile for weekday (if weekend is desired, tab "vol profile" needs to be adjusted)

Traffic Volumes Hour Major Street Minor Street Major St. Minor St. Adj. Factor Adj. Factor Begin End SB ΕB WB 4:30 PM 5:30 PM 723 924 138 1.00 1.00 85 2nd Highest Hour 684 110 0.95 0.79 875 68 3rd Highest Hour 675 862 103 0.93 0.75 4th Highest Hour 92 0.89 646 825 56 0.66 5th Highest Hour 636 813 52 85 0.88 0.62 6th Highest Hour 79 636 813 48 0.88 0.57 7th Highest Hour 607 776 48 77 0.84 0.56 8th Highest Hour 598 764 44 72 0.83 0.52 72 0.52 9th Highest Hour 578 739 44 0.80 10th Highest Hour 540 690 44 71 0.75 0.51 11th Highest Hour 63 0.72 521 665 39 0.46 12th Highest Hour 511 653 37 61 0.71 0.44 13th Highest Hour 492 30 49 0.68 0.36 14th Highest Hour 424 48 0.59 542 29 0.35 15th Highest Hour 337 431 28 45 0.47 0.33 16th Highest Hour 407 44 0.32 318 27 0.44 17th Highest Hour 0.19 222 283 16 26 0.31 18th Highest Hour 183 234 16 26 0.25 0.19 19th Highest Hour 96 123 10 0.13 0.07 20th Highest Hour 86 0.09 0.06 21st Highest Hour 58 74 5 0.08 0.04 22nd Highest Hour 39 49 1 1 0.05 0.01 23rd Highest Hour 19 25 0.03 0.01 24th Highest Hour 19 25 0.03 0.01

Based on 2009 Edition of the MUTCD

Project #: 23021.002

Project Name: TV Trail Concept Plan

Analyst: NHG
Date: 3/9/2021

Intersection: Blanton Street/185th Avenue (south)

Scenario: 2021 Existing Conditions

Volume Adjustment Factor = 1.0 North-South Approach = Major East-West Approach = Minor Major Street Thru Lanes = 1 Minor Street Thru Lanes = 1 Speed > 40 mph? No Population < 10,000? No **Warrant Factor** 100% Peak Hour or Daily Count? Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Highest	Yes	No
#2	Four-Hour	Yes	Yes
#3	Peak Hour	Yes	Yes

**This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Select Type Of Major Street Approach From Dropdown Menu

Urban Minor Arterial
Rural Minor Collector

Select Type Of Minor Street Approach From Dropdown Menu

Note: traffic volume profile for weekday (if weekend is desired, tab "vol profile" needs to be adjusted)

Traffic Volumes Hour Major Street Minor Street Major St. Minor St. Adj. Factor Adj. Factor Begin End SB ΕB WB 4:35 PM 5:35 PM 655 879 138 1.00 1.00 2nd Highest Hour 620 110 0.95 0.79 832 3rd Highest Hour 611 820 103 0.93 0.75 4th Highest Hour 585 92 0.89 785 0.66 4 5th Highest Hour 576 774 85 0.88 0.62 6th Highest Hour 79 576 774 0.88 0.57 7th Highest Hour 550 738 77 0.84 0.56 8th Highest Hour 541 727 72 0.83 0.52 72 0.52 9th Highest Hour 703 0.80 524 10th Highest Hour 489 656 71 0.75 0.51 11th Highest Hour 63 0.72 472 633 0.46 12th Highest Hour 463 621 61 0.71 0.44 13th Highest Hour 445 49 0.68 0.36 14th Highest Hour 48 0.59 0.35 384 516 15th Highest Hour 306 410 45 0.47 0.33 16th Highest Hour 387 44 0.32 288 0.44 2 17th Highest Hour 0.19 201 270 26 0.31 18th Highest Hour 166 223 26 0.25 0.19 19th Highest Hour 87 117 10 0.13 0.07 20th Highest Hour 61 0.09 0.06 21st Highest Hour 52 70 5 0.08 0.04 0 22nd Highest Hour 35 47 0 1 0.05 0.01 23rd Highest Hour 17 23 0.03 0.01 24th Highest Hour 17 23 0 0.03 0.01

Based on 2009 Edition of the MUTCD

23021.002 Project #:

Project Name: TV Trail Concept Plan

Analyst: NHG 3/9/2021 Date:

Shaw Street/160th Avenue Intersection:

2021 Existing Conditions Scenario:

Volume Adjustment Factor = 1.0 North-South Approach = Major East-West Approach = Minor Major Street Thru Lanes = 1 Minor Street Thru Lanes = 1 Speed > 40 mph? No Population < 10,000? No Warrant Factor 100% Peak Hour or Daily Count? Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Highest	Yes	No
#2	Four-Hour	Yes	No
#3	Peak Hour	Yes	No

Select Type Of Major Street Approach From Dropdown Menu Select Type Of Minor Street Approach From Dropdown Menu

Urban Minor Arterial Rural Minor Collector

Note: traffic volume profile for weekday (if weekend is desired, tab "vol profile" needs to be adjusted)

Traffic Volumes Major Street

Hour		Major	Street	Minor	Street	Major St.	Minor St.
Begin	End	NB	SB	EB	WB	Adj. Factor	Adj. Factor
4:30 PM	5:30 PM	227	461	24	7	1.00	1.00
2nd Highest	t Hour	215	436	19	6	0.95	0.79
3rd Highest	Hour	212	430	18	5	0.93	0.75
4th Highest	Hour	203	412	16	5	0.89	0.66
5th Highest	Hour	200	406	15	4	0.88	0.62
6th Highest	Hour	200	406	14	4	0.88	0.57
7th Highest	Hour	191	387	13	4	0.84	0.56
8th Highest	Hour	188	381	13	4	0.83	0.52
9th Highest	Hour	182	369	13	4	0.80	0.52
10th Highes	10th Highest Hour		344	12	4	0.75	0.51
11th Highes	st Hour	163	332	11	3	0.72	0.46
12th Highes	st Hour	160	326	11	3	0.71	0.44
13th Highes	st Hour	154	313	9	2	0.68	0.36
14th Highes	st Hour	133	270	8	2	0.59	0.35
15th Highes	st Hour	106	215	8	2	0.47	0.33
16th Highes	st Hour	100	203	8	2	0.44	0.32
17th Highes	st Hour	70	141	4	1	0.31	0.19
18th Highes	st Hour	58	117	4	1	0.25	0.19
19th Highes	st Hour	30	61	2	1	0.13	0.07
20th Highes	st Hour	21	43	1	0	0.09	0.06
21st Highes	t Hour	18	37	1	0	0.08	0.04
22nd Highe	st Hour	12	25	0	0	0.05	0.01
23rd Highes	st Hour	6	12	0	0	0.03	0.01
24th Highes	st Hour	6	12	0	0	0.03	0.01

Appendix D Crosswalk Assessments

SW Blanton Street/SW 198th Avenue

The SW Blanton Street/SW 198th Avenue intersection is an unsignalized, off-set intersection located along the potential SW Blanton Street TV Trail alignment. SW 198th has four-lane cross section with two 12-foot travel lanes, one 12-foot right-turn lane, one 12-foot two-way-left-turn lane, and a 2-foot shoulder on the east side. The ramp-to-ramp crossing distance is approximately 68 feet. No crosswalks are currently provided.



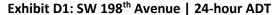


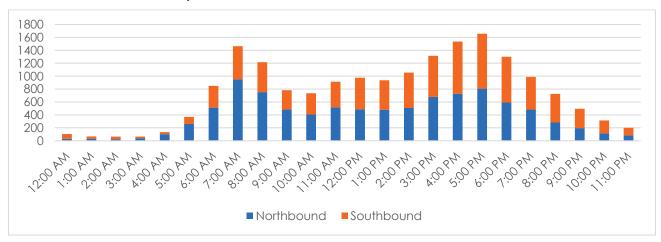
Vehicular Dataset (Station #335)

Vehicular volumes and travel speeds were extracted from tube count data collected approximately 0.1 miles south of TV Highway. The 2018 tube count data was selected based on the higher vehicle volumes.

Vehicular Volumes

The vehicular average daily volume was 18,267 including 9,556 northbound and 8,711 southbound in 2018. The vehicular peak hour occurred between 5:00 and 6:00PM. During this time 1,657 vehicles were recorded traveling on SW 198th Avenue including 808 northbound and 849 southbound. Exhibit D1 summarizes the 24-hour volumes





Travel Speeds

The posted speed limit along SW 198th Avenue at the proposed crossing location is 35 mph. Based on the tube count data, the 85th percentile speed along SW 198th Avenue is 36 mph. The 85th percentile speeds were used based on the proximity of the tube counts.

Walking and Biking Activity

No walking, biking, and rolling activity was collected at intersection of Blanton Street/198th Avenue due to an ongoing construction project at the intersection during the time of data collection.

NCHRP Report 562 Analysis

A sensitivity analysis was conducted to determine the minimum number of people required to cross the SW Blanton Street/SW 198th Avenue intersection in a peak hour period to trigger an enhanced crossing treatment. summarizes the existing PM peak hour activity excluding walking and biking activity.

Table D1: SW Blanton Street/SW 198th Avenue

Walking and Biking Peak Hour Crossing Volume	Posted or 85 th Percentile Speed	Peak Hour Vehicular Volume	Pedestrian Crossing Distance	NCHRP Report 562 Recommendation
NA	36 MPH	1,657	68 Feet	Consider raised median islands, curb extensions, traffic calming, etc. as feasible

Based on the information summarized in Table D1, the minimum threshold of walking and biking crossings to trigger an enhanced crossing treatment is 14. Under this scenario a "RED" indication is met.

In addition, a sensitivity analysis was conducted assuming a raised median would be present, which would allow for a staged crossing. Based on a peak hour one-directional volume of 849 vehicles, the minimum threshold of walking and biking crossings to trigger an enhanced crossing treatment is 14, meeting a "RED" indication.

FHWA Safety Countermeasure Matrix

Figure D1 illustrates the countermeasure matrix and highlights the applicable matrix cell based on the roadway configuration, posted speed limit, and AADT within the study area.

Figure D1: Application of Pedestrian Crash Countermeasures by Roadway Feature - Blanton/198th

			P	osted Sp	eed Limit	t and AAC	T		
	Vehic	ele AADT <	7,000	Vehicle /	ADT 9,000	-15,000	Vehic	5,000	
Roadway Configuration	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
4+ lanes w/o raised median (2 or more lanes in each direction)	1 5 6 7 8 9	① 3 5 3 7 8 9		5 6		5 6	5 🔞	5 6	

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- O Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- 1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
- 2 Raised crosswalk
- 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- 4 In-Street Pedestrian Crossing sign
- 5 Curb extension
- 6 Pedestrian refuge island
- 7 Rectangular Rapid-Flashing Beacon (RRFB)**
- 8 Road Diet
- 9 Pedestrian Hybrid Beacon (PHB)**

Based on the guidance provided in the countermeasure matrix table, the following countermeasures are proposed by the FHWA methodology at the SW Blanton/SW 198th Avenue intersection.

Countermeasures to be considered

- Advance Yield Here To (Stop Here For) Pedestrian sign and yield (stop) line
- Curb extension
- Pedestrian refuge island
- Rectangular Rapid-Flashing Beacon (RRFB)
- Road Diet
- Pedestrian Hybrid Beacon (PHB)⁵

Enhancements that should occur in conjunction with other countermeasures

• High visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs

Recommendation

Based on the results of the NCHRP Report 562 analysis and the FHWA safety countermeasure matrix, a half signal is recommended at the intersection of SW Blanton Street/SW 198th Avenue to provide a fully protected crossing for trail users. A half signal is recommended be installed at the northern off-set intersection. Under this scenario, a two-way shared-use path is recommended along the west side of 198th Avenue between the northern and southern off-set intersections to traverse trail uses between the intersection approaches. The location of the shared-use path and half signal was selected due to available right-of-way on the west side of SW 198th Avenue.

⁵ A Pedestrian Hybrid Beacon (PHB, previously known as High-intensity Activate crossWalK (HAWK) signal) was not considered primarily because they are currently not allowed on Washington County facilities. Half signals were considered instead where a HAWK was identified for consideration by the FHWA guidance.

SW Blanton Street/SW 185th Avenue

The SW Blanton Street/SW 185th Avenue intersection is an unsignalized, off-set intersection located approximately 600 feet south of TV Highway and 435 feet south of the railroad. SW 185th Avenue has five-lane cross section with four 11-foot travel lanes, one 14-foot center turn lane, and two 6-foot bike lanes. The overall crossing distance is approximately 80 feet measured from pedestrian ramp to pedestrian ramp. No crosswalks are currently provided.





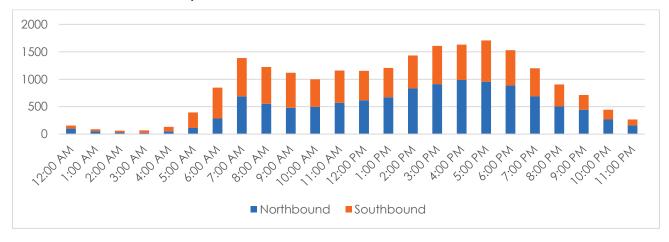
Vehicular Dataset (Station #334)

Vehicular volumes and travel speeds were extracted from tube count data collected approximately 0.3 mile south of TV Highway. The 2018 tube count data was selected based on the higher vehicle volumes compared to 2019.

Vehicular Volumes

The vehicular average daily volume was 21,428 including 11,363 northbound and 10,065 southbound in 2018. The vehicular peak hour occurred between 5:00 and 6:00PM. During this time, 1,707 vehicles were recorded traveling on SW 185th Avenue, including 956 northbound and 751 southbound. Exhibit D2 summarizes the 24-hour volumes.





Travel Speeds

The posted speed limit along SW 185th Avenue at the proposed crossing location is 35 mph. Based on the tube count data, the 85th percentile speed is 39 mph. Based on the proximity of the tube count location to the potential trail crossing, the posted speed was used for the enhanced crossing assessment.

Walking, Biking, and Rolling Activity

Walking, biking, and rolling activity was collected at the northern and southern off-set intersections of Blanton Street/185th Avenue. At the northern intersection, the peak hour of walking, biking, and rolling activity occurred between 4:25 and 5:25PM. During this time, 60 people entered the intersection and six people crossed SW 185th Avenue. At the southern intersection, the peak hour of walking and biking activity occurred between 4:35 and 5:35PM. During this time, 42 people entered the intersection and two people crossed SW 185th Avenue.

NCHRP Report 562 Analysis

NCHRP Report 562 methodology was applied to the potential crossing based on the 2018 and 2021 data summarized above utilizing the highest volumes under each scenario. Table D2 summarizes the PM peak hour for walking, biking, and vehicular activity.

Table D2: SW Blanton Street/SW 185th Avenue

Intersection	Walking and Biking Peak Hour Crossing Volume	Posted or 85 th Percentile Speed	Peak Hour Vehicular Volume	Pedestrian Crossing Distance	NCHRP Report 562 Recommendation
Blanton Street (Northern)	6	35 MPH	1,707	80 Feet	Consider raised median islands, curb extensions, traffic calming, etc. as feasible
Blanton Street (Southern)	2	35 MPH	1,707	80 Feet	Consider raised median islands, curb extensions, traffic calming, etc. as feasible

As summarized in Table D2, existing walking and biking crossing volumes <u>do not meet the minimum</u> criteria for a traffic control type of crossing treatment under existing conditions; however volumes would be anticipated to increase significantly if regional trail quality facilities were provided.

Sensitivity Analysis

A sensitivity analysis was conducted to determine the minimum number of people required to cross the SW Blanton Street/SW 185th Avenue intersection (northern and southern intersections) in a peak hour period to trigger an enhanced crossing treatment. Based on the information summarized in Table D2, the minimum threshold of walking and biking crossings to trigger an enhanced crossing treatment is 20. Under this scenario a "RED" indication is met.

In addition, a sensitivity analysis was conducted assuming a raised median would be present, which would allow for a staged crossing. Based on a peak hour one-directional volume of 956 vehicles, the minimum threshold of walking and biking crossings to trigger an enhanced crossing treatment is 20, meeting a "RED" indication.

FHWA Safety Countermeasure Matrix

Figure D2 illustrates the countermeasure matrix and highlights the applicable matrix cell based on the roadway configuration, posted speed limit, and AADT within the study area.

Figure D2: Application of Pedestrian Crash Countermeasures by Roadway Feature - Blanton/185th

			P	osted Sp	eed Limit	and AAC	T		
	Vehic	ole AADT <9	9,000	Vehicle A	ADT 9,000	15,000	Vehic	5,000	
Roadway Configuration	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
4+ lanes w/o raised median (2 or more lanes in each direction)	0 3 5 6 7 8 9	① 3 5 3 7 8 9		5 6	_	5 6	5 6	5 6	

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- O Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- 1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
- 2 Raised crosswalk
- 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- 4 In-Street Pedestrian Crossing sign
- 5 Curb extension
- 6 Pedestrian refuge island
- 7 Rectangular Rapid-Flashing Beacon (RRFB)**
- 8 Road Diet
- 9 Pedestrian Hybrid Beacon (PHB)**

Based on the guidance provided in the countermeasure matrix table, the following countermeasures are proposed by the FHWA methodology at the SW Blanton Street/SW 185th Avenue intersection.

Countermeasures to be considered

- Advance Yield Here To (Stop Here For) Pedestrian sign and yield (stop) line
- Curb extension
- Pedestrian refuge island
- Road Diet
- Pedestrian Hybrid Beacon (PHB)⁶

Enhancements that should occur in conjunction with other countermeasures

 High visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs

⁶ A Pedestrian Hybrid Beacon (PHB, previously known as High-intensity Activate crossWalK (HAWK) signal) was not considered primarily because they are currently not allowed on Washington County facilities. Half signals were considered instead where a HAWK was identified for consideration by the FHWA guidance.

Recommendation

Based on the results of the NCHRP Report 562 analysis and the FHWA safety countermeasure matrix, a half signal is recommended at the intersection of SW Blanton Street/SW 185th Avenue to provide a fully protected crossing for trail users. Due to the proximity of railroad infrastructure at the northern off-set intersection, a half signal is recommended at the southern off-set intersection to avoid railroad conflict. Under this scenario, a two-way shared-use path is recommended along the west side of SW 185th Avenue between the off-set intersections to traverse trail uses between the intersection approaches.

SW Blanton Street/SW 160th Avenue

The SW Blanton Street/SW 160th Avenue intersection is an unsignalized intersection located approximately 800 feet south of TV Highway and 570 feet south of the railroad. SW 160th Avenue has a three-lane cross section with two 12-foot travel lanes and one 14-foot center turn lane. The ramp-to-ramp crossing distance is approximately 58 feet. No crosswalks are currently provided.





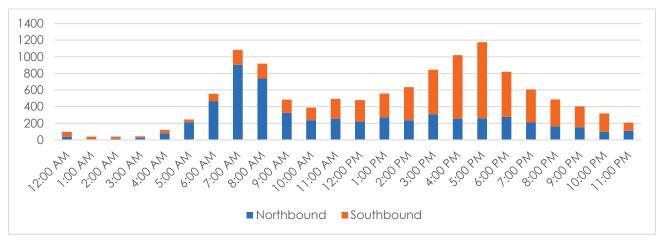
Vehicular Dataset (Station #349)

Vehicular volumes and travel speeds were extracted from tube count data collected approximately 0.1 miles south of TV Highway. The 2018 tube count data was selected based on the higher vehicle volumes.

Vehicular Volumes

The vehicular average daily volume was 12,064 including 5,867 northbound and 6,197 southbound in 2018. The vehicular peak hour occurred between 5:00 and 6:00PM. During this time 1,176 vehicles were recorded traveling on SW 160th Avenue including 259 northbound and 917 southbound. Exhibit D3 summarizes the 24-hour volumes.

Exhibit D3: SW 160th Avenue | 24-hour ADT



Travel Speeds

The posted speed limit along SW 160th Avenue at the proposed crossing location is 35 mph. Based on the tube count data, the 85th percentile speed along SW 160th Avenue is also 35 mph.

Walking, Biking, and Rolling Activity

Walking, biking, and rolling activity was collected at intersection of SW Blanton Street/SW 160th Avenue. The peak hour of walking, biking, and rolling activity occurred between 4:40 and 5:40PM. During this time, 36 people entered the intersection and 13 people crossed SW 160th Avenue.

NCHRP Report 562 Analysis

NCHRP Report 562 methodology was applied to the potential crossing based on the 2018 and 2021 data summarized above utilizing the highest volumes under each scenario. Table D3 summarizes the PM peak hour for walking, biking, and vehicular activity.

Table D3: SW Blanton Street/SW 160th Avenue

Walking and Biking Peak Hour Crossing Volume	Posted or 85 th Percentile Speed	Peak Hour Vehicular Volume	Pedestrian Crossing Distance	NCHRP Report 562 Recommendation
13	35 MPH	1,176	58 Feet	Consider raised median islands, curb extensions, traffic calming, etc. as feasible

As summarized in Table D3, existing walking, biking, and rolling crossing volumes <u>do not meet the</u> <u>minimum</u> criteria for a traffic control type of crossing treatment under existing conditions; however volumes would be anticipated to increase significantly if regional trail quality facilities were provided.

Sensitivity Analysis

A sensitivity analysis was conducted to determine the minimum number of people required to cross the SW Blanton Street/SW 160th Avenue intersection in a peak hour period to trigger an enhanced crossing

treatment. Based on the information summarized Table D3, the minimum threshold of walking and biking crossings to trigger an enhanced crossing treatment is 20. Under this scenario a "RED" indication is met.

In addition, a sensitivity analysis was conducted assuming a raised median would be present, which would allow for a staged crossing. Based on a peak hour one-directional volume of 917 vehicles, the minimum threshold of walking and biking crossings to trigger an enhanced crossing treatment is 20, meeting an "ACTIVE OR ENHANCED" indication.

FHWA Safety Countermeasure Matrix

Figure D3 Ilustrates the countermeasure matrix and highlights the applicable matrix cell based on the roadway configuration, posted speed limit, and AADT within the study area.

Figure D3: Application of Pedestrian Crash Countermeasures by Roadway Feature - Blanton/160th

								P	ost	ed	Sp	eed	Lin	nit	an	d A	DT								
		Ve	ehic	le A	ADT -	<9	,000		Ve	ehio	le A	ADT	9,0	00-	-15	,000		Vehicle AADT > 15,000						00	
Roadway Configuration	≤3	0 m	mph 35 mph ≥40 m				mph	≤3	0 m	ìph	35 mph			≥40 mph			30	mph	35 mph			≥40 mph		ı	
3 lanes w/o raised median	0	2	3	0	•	3	0	3	0		3	0	(3	0	•) (D	0	0		8	0	•	•
(1 lane in each direction with a	4	5	6		5	5	!	5 6	4	5	6		5	6		5 (5 .	4	5 6		5	6	5	6	
two-way left-turn lane)	7		9	7	(9		9	7		9	0	(9				7	9			0		6)

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- 1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
- 2 Raised crosswalk
- 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- 4 In-Street Pedestrian Crossing sign
- 5 Curb extension
- 6 Pedestrian refuge island
- 7 Rectangular Rapid-Flashing Beacon (RRFB)**
- 8 Road Diet
- 9 Pedestrian Hybrid Beacon (PHB)**

Based on the guidance provided in the countermeasure matrix table, the following countermeasures are proposed by the FHWA methodology at the SW Blanton Street/SW 160th Avenue intersection.

Countermeasures to be considered

- Advance Yield Here To (Stop Here For) Pedestrian sign and yield (stop) line
- Curb extension
- Pedestrian refuge island
- Rectangular Rapid-Flashing Beacon (RRFB)

Pedestrian Hybrid Beacon (PHB)⁷

Enhancements that should occur in conjunction with other countermeasures

 High visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs

Recommendation

Based on the results of the NCHRP Report 562 analysis and the FHWA safety countermeasure matrix, a half signal is recommended at the intersection of SW Blanton Street/SW 160th Avenue to provide a fully protected crossing for trail users. In addition, a pedestrian refuge island is recommended at the northbound approach to provide an optional two-staged crossing for people walking and biking⁸.

SW Shaw Street/SW 185th Avenue

The SW Shaw Street/SW 185th Avenue intersection is an unsignalized intersection located approximately 220 feet south of TV Highway and 50 feet south of the railroad. SW 185th has five-lane cross section with four 11-foot travel lanes, one 11-foot northbound left-turn lane, one 5-foot raised median, and two 5-foot shoulders. The ramp-to-ramp crossing distance is approximately 80 feet; however, the existing center median installed for the railroad quiet zone limits the ability for someone walking or rolling to cross 185th Avenue. No crosswalks are currently provided across 185th Avenue.





⁷ A Pedestrian Hybrid Beacon (PHB, previously known as High-intensity Activate crossWalK (HAWK) signal) was not considered primarily because they are currently not allowed on Washington County facilities. Half signals were considered instead where a HAWK was identified for consideration by the FHWA guidance.

⁸ Sidewalk improvements including ADA ramp upgrades are recommended in the southwest corner of the intersection to provide a continuous connection for people crossing 160th Avenue to points west along Blanton Street.

Vehicular Dataset (Station #334)

Vehicular volumes and travel speeds were extracted from tube count data collected approximately 0.3 miles south of TV Highway. The 2018 tube count data was selected based on the higher vehicle volumes compared to 2019.

Vehicular Volumes

The vehicular average daily volume was 21,428 including 11,363 northbound and 10,065 southbound in 2018. The vehicular peak hour occurred between 5:00 and 6:00PM. During this time, 1,707 vehicles were recorded traveling SW 185th Avenue, including 956 northbound and 751 southbound. Exhibit D4 summarizes the 24-hour volumes.

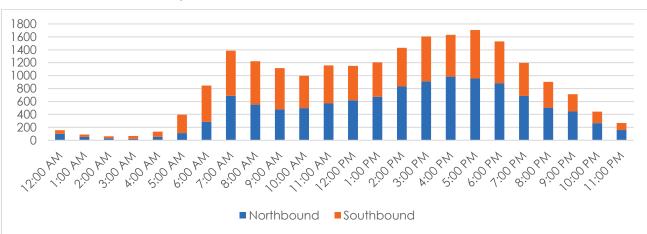


Exhibit D4: SW 185th Avenue | 24-hour ADT

Travel Speeds

The posted speed limit along SW 185th Avenue at the proposed crossing location is 35 mph. Based on the tube count data, the 85th percentile speed along SW 185th Avenue is 39 mph; however, based on the location of the tube counts, the posted speed was used for the enhanced crossing assessment.

Walking and Biking Activity

Walking, biking, and rolling activity was collected at intersection of Shaw Street/185th Avenue. The peak hour of walking, biking, and rolling activity occurred between 4:00 and 5:00PM. During this time, one person entered the intersection who crossed 185th Avenue in the eastbound direction.

NCHRP Report 562 Analysis

NCHRP Report 562 methodology was applied to the potential crossing based on the 2018 and 2021 data summarized above utilizing the highest volumes under each scenario. Table D4 summarizes the PM peak hour for walking, biking, and vehicular activity.

Table D4: SW Shaw Street/SW 185th Avenue

Walking and Biking Peak Hour Crossing Volume	Posted or 85 th Percentile Speed	Peak Hour Vehicular Volume	Pedestrian Crossing Distance	NCHRP Report 562 Recommendation
1	35 MPH	1,707	80 Feet	Consider raised median islands, curb extensions, traffic calming, etc. as feasible

As summarized in Table D4, existing walking and biking crossing volumes <u>do not meet the minimum</u> criteria for a traffic control type of crossing treatment under existing conditions; however volumes would be anticipated to increase significantly if regional trail quality facilities were provided.

Sensitivity Analysis

A sensitivity analysis was conducted to determine the minimum number of people required to cross the SW Shaw Street/SW 185th Avenue intersection in a peak hour period to trigger an enhanced crossing treatment. Based on the information summarized in Table D4, the minimum threshold of walking, biking, and rolling crossings to trigger an enhanced crossing treatment is 20. Under this scenario a "RED" indication is met.

In addition, a sensitivity analysis was conducted assuming a raised median would be present, which would allow for a staged crossing. Based on a peak hour one-directional volume of 956 vehicles, the minimum threshold of walking and biking crossings to trigger an enhanced crossing treatment is still 20, meeting a "RED" indication.

FHWA Safety Countermeasure Matrix

Figure D4 illustrates the countermeasure matrix and highlights the applicable matrix cell based on the roadway configuration, posted speed limit, and AADT within the study area.

Figure D4: Application of Pedestrian Crash Countermeasures by Roadway Feature - Shaw/185th

			P	osted Sp	eed Limit	and AAD	T			
	Vehic	ole AADT <9	7,000	Vehicle A	ADT 9,000	-15,000	Vehic	5,000		
Roadway Configuration	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	
4+ lanes w/o raised median (2 or more lanes in each direction)	0 3 5 6 7 8 9	① 3 5 6 7 8 9		5 🔞	5 6	5 6	5 🙆	5 6		

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- O Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- 1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
- 2 Raised crosswalk
- 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- 4 In-Street Pedestrian Crossing sign
- 5 Curb extension
- 6 Pedestrian refuge island
- 7 Rectangular Rapid-Flashing Beacon (RRFB)**
- 8 Road Diet
- 9 Pedestrian Hybrid Beacon (PHB)**

Based on the guidance provided in the countermeasure matrix table, the following countermeasures are proposed by the FHWA methodology at the SW Shaw Street/SW 185th Avenue intersection.

Countermeasures to be considered

- Advance Yield Here To (Stop Here For) Pedestrian sign and yield (stop) line
- Curb extension
- Pedestrian refuge island
- Road Diet
- Pedestrian Hybrid Beacon (PHB)⁹

Enhancements that should occur in conjunction with other countermeasures

 High visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs

Recommendation

Based on the results of the NCHRP Report 562 analysis and the FHWA safety countermeasure matrix, a half signal is recommended at the intersection of SW Shaw Street/SW 185th Avenue to provide a fully

⁹ A Pedestrian Hybrid Beacon (PHB, previously known as High-intensity Activate crossWalK (HAWK) signal) was not considered primarily because they are currently not allowed on Washington County facilities. Half signals were considered instead where a HAWK was identified for consideration by the FHWA guidance.

protected crossing for future trail users. Signal coordination with the existing traffic signal at the TV Highway/SW 185th Avenue intersection and adjacent railroad crossing must be explored (See Shaw Street Crossings and Railroad Operations Impacts section). Modifications to the exiting median will be required to allow trail users to pass through the raised curbs.

SW Shaw Street/SW 170th Avenue

The SW Shaw Street/SW 170th Avenue intersection is an unsignalized intersection located approximately 130 feet south of the TV Highway/SW 170th Avenue intersection and 60 feet south of the railroad. SW 170th has five-lane cross section with four 12-foot travel lanes, one 12-foot northbound left-turn lane, one 9-foot raised median, and two 5-foot bike lanes. The overall crossing distance is approximately 110 feet. No crosswalks are currently provided.





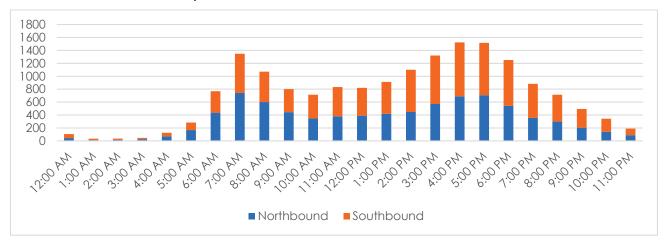
Vehicular Dataset (Station #322)

Vehicular volumes and travel speeds were extracted from tube count data collected approximately 0.1 miles north of Farmington Road. 2019 tube count data was selected for analysis purposes; 2018 tube count data was not available.

Vehicular Volumes

The average vehicular daily volume was 17,234 including 8,140 northbound and 9,094 southbound in 2019. The vehicular peak hour occurred between 4:00 and 5:00PM. During this time, 1,525 vehicles were recorded traveling SW 170th Avenue, including 689 northbound and 836 southbound. Exhibit D5 summarizes the 24-hour volumes.

Exhibit D5: SW 170th Avenue | 24-hour ADT



Travel Speeds

The posted speed limit along SW 170th Avenue at the proposed crossing location is 40 mph. Based on the tube count data, the 85th percentile speed along SW 170th Avenue is 42 mph; however, based on the location of the tube counts, the posted speed was used for the enhanced crossing assessment.

Walking and Biking Activity

Walking, biking, and rolling activity was collected at intersection of Shaw Street/170th Avenue. No walking, biking or rolling activity was recorded based on the time period of 4:00 to 6:00PM.

NCHRP Report 562 Analysis

NCHRP Report 562 methodology was applied to the potential crossing based on the 2019 and 2021 datasets summarized above. Table D5 summarizes the PM peak hour activity.

Table D5: SW Shaw Street/SW 170th Avenue

Walking and Biking Peak Hour Crossing Volume	Posted or 85 th Percentile Speed	Peak Hour Vehicular Volume	Pedestrian Crossing Distance	NCHRP Report 562 Recommendation
0	40 MPH	1,525	110 Feet	Consider raised median islands, curb extensions, traffic calming, etc. as feasible

As summarized in Table D5, existing walking and biking crossing volumes <u>do not meet the minimum</u> criteria for a traffic control type of crossing treatment under existing conditions; however volumes would be anticipated to increase significantly if regional trail quality facilities were provided.

Sensitivity Analysis

A sensitivity analysis was conducted to determine the minimum number of people required to cross the SW Shaw Street/SW 170th Avenue intersection in a peak hour period to trigger an enhanced crossing treatment. Based on the information summarized in Table D5, the minimum threshold of walking and

biking crossings to trigger an enhanced crossing treatment is 14. Under this scenario a "RED" indication is met.

In addition, a sensitivity analysis was conducted assuming a raised median would be present, which would allow for a staged crossing. Based on a peak hour one-directional volume of 836 vehicles, the minimum threshold of walking and biking crossings to trigger an enhanced crossing treatment is still 14, meeting a "RED" indication.

FHWA Safety Countermeasure Matrix

Figure D5 illustrates the countermeasure matrix and highlights the applicable matrix cell based on the roadway configuration, posted speed limit, and AADT within the study area.

Figure D5: Application of Pedestrian Crash Countermeasures by Roadway Feature - Shaw/170th

			Р	osted Sp	eed Limi	t and AAC	TC						
	Vehi	cle AADT <	9,000	Vehicle A	ADT 9,000	15,000	Vehic	Vehicle AADT > 15					
Roadway Configuration	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph				
4+ lanes w/o raised median (2 or more lanes in each direction)	0 3 5 6 7 8 9			5 6	5 6	5 6	5 6		_				

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- O Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
- 2 Raised crosswalk
- 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- 4 In-Street Pedestrian Crossing sign
- 5 Curb extension
- 6 Pedestrian refuge island
- 7 Rectangular Rapid-Flashing Beacon (RRFB)**
- 8 Road Diet
- 9 Pedestrian Hybrid Beacon (PHB)**

Based on the guidance provided in the countermeasure matrix table, the following countermeasures are proposed by the FHWA methodology at the SW Shaw Street/SW 170th Avenue intersection.

Countermeasures to be considered

- Advance Yield Here To (Stop Here For) Pedestrian sign and yield (stop) line
- Curb extension
- Pedestrian refuge island
- Road Diet

Pedestrian Hybrid Beacon (PHB)¹⁰

Enhancements that should occur in conjunction with other countermeasures

 High visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs

Recommendation

Based on the results of the NCHRP Report 562 analysis and the FHWA safety countermeasure matrix, a half signal is recommended at the intersection of SW Shaw Street/SW 170th Avenue to provide a fully protected crossing for future trail users. Signal coordination with the existing traffic signal at the TV Highway/SW 170th Avenue intersection and adjacent railroad crossing must be explored (See Shaw Street Crossings and Railroad Operations Impacts section). Modifications to the exiting median will be required to allow trail users to pass through the raised curbs.

SW Shaw Street/SW 160th Avenue

The SW Shaw Street/SW 160th Avenue intersection is an unsignalized, off-set intersection. The crossing analysis is focused on the southern off-set portion of the intersection which is located approximately 300 feet south of the TV Highway/SW 160th Avenue intersection and 56 feet south of the railroad. At the proposed trail crossing location, SW 160th has four-lane cross section with four 11-foot travel lanes. The ramp-to-ramp crossing distance is approximately 56 feet. No crosswalks are currently provided.





¹⁰ A Pedestrian Hybrid Beacon (PHB, previously known as High-intensity Activate crossWalK (HAWK) signal) was not considered primarily because they are currently not allowed on Washington County facilities. Half signals were considered instead where a HAWK was identified for consideration by the FHWA guidance.

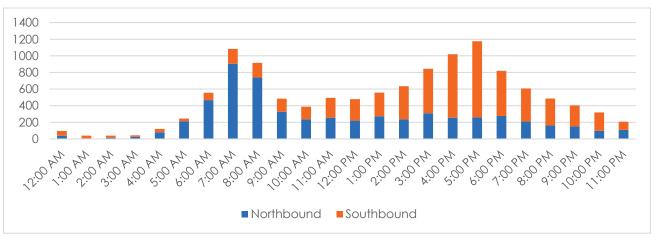
Vehicular Dataset (Station #349)

Vehicular volumes and travel speeds were extracted from tube count data collected approximately 0.1 miles south of TV Highway. The 2018 tube count data was selected based on the higher vehicle volumes.

Vehicular Volumes

The average vehicular daily volume was 12,064 including 5,867 northbound and 6,197 southbound in 2018. The vehicular peak hour occurred between 5:00 and 6:00PM. During this time 1,176 vehicles were recorded traveling on SW 160th Avenue including 259 northbound and 917 southbound. Exhibit D6 summarizes the 24-hour volumes.

Exhibit D6: SW 160th Avenue | 24-hour ADT



Travel Speeds

The posted speed limit along SW 160th Avenue at the proposed crossing location is 35 mph. Based on the tube count data, the 85th percentile speed along SW 160th Avenue is also 35 mph.

Walking and Biking Activity

Walking, biking, and rolling activity was collected at intersection of Shaw Street/160th Avenue. The peak hour of walking, biking, and rolling activity occurred between 4:40 and 5:40PM. During this time, 12 people entered the intersection and two people crossed SW 160th Avenue.

NCHRP Report 562 Analysis

NCHRP Report 562 methodology was applied to the potential crossing based on the 2018 and 2021 data summarized above utilizing the highest volumes under each scenario. Table D6 summarizes the PM peak hour for walking, biking, and vehicular activity.

Table D6: SW Shaw Street/SW 160th Avenue

Walking and Biking Peak Hour Crossing Volume	Posted or 85 th Percentile Speed	Peak Hour Vehicular Volume	Pedestrian Crossing Distance	NCHRP Report 562 Recommendation
2	35 MPH	1,176	56 Feet	Consider raised median islands, curb extensions, traffic calming, etc. as feasible

As summarized in Table D6, existing walking and biking crossing volumes <u>do not meet the minimum</u> criteria for a traffic control type of crossing treatment under existing conditions; however volumes would be anticipated to increase significantly if regional trail quality facilities were provided.

Sensitivity Analysis

A sensitivity analysis was conducted to determine the minimum number of people required to cross the SW Shaw Street/SW 160th Avenue intersection in a peak hour period to trigger an enhanced crossing treatment. Based on the information summarized in Table D6, the minimum threshold of walking and biking crossings to trigger an enhanced crossing treatment is 20. Under this scenario a "RED" indication is met.

In addition, a sensitivity analysis was conducted assuming a raised median would be present, which would allow for a staged crossing. Based on a peak hour one-directional volume of 917 vehicles, the minimum threshold of walking and biking crossings to trigger an enhanced crossing treatment is still 20, meeting an "ACTIVE OR ENHANCED" indication.

FHWA Safety Countermeasure Matrix

Figure D6 illustrates the countermeasure matrix and highlights the applicable matrix cell based on the roadway configuration, posted speed limit, and AADT within the study area.

Figure D6: Application of Pedestrian Crash Countermeasures by Roadway Feature - Blanton/160th

								P	ost	ed	Sp	eed	Lim	it a	nd /	٩AE	T						
		Ve	hic	le A	ADT	<9	,000		Ve	ehic	ele A	ADT	9,00	10–1	5,00	00		Vel	nicl	e AAD	T > 1	5,00	00
Roadway Configuration	≤3	0 m	mph 35 mph ≥40 mp					mph	≤3	0 n	nph	35	mph	≥.	40 n	nph	≤30 mph			35 n	nph	≥40 mph	
3 lanes w/o raised median	0	2		0		_	0	_	0			0		0			0			0		0	0
(1 lane in each direction with a two-way left-turn lane)	7	5	6	7	5	6 9	5	6 9	7	5	-	0	5 6		5	6 9	7	5	6	5	6 9		6 0

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- O Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
- 2 Raised crosswalk
- 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- 4 In-Street Pedestrian Crossing sign
- 5 Curb extension
- 6 Pedestrian refuge island
- 7 Rectangular Rapid-Flashing Beacon (RRFB)**
- 8 Road Diet
- 9 Pedestrian Hybrid Beacon (PHB)**

Based on the guidance provided in the countermeasure matrix table, the following countermeasures are proposed by the FHWA methodology at the SW Shaw Street/SW 160th Avenue intersection.

Countermeasures to be considered

- Advance Yield Here To (Stop Here For) Pedestrian sign and yield (stop) line
- Curb extension
- Pedestrian refuge island
- Rectangular Rapid-Flashing Beacon (RRFB)
- Pedestrian Hybrid Beacon (PHB)¹¹

Enhancements that should occur in conjunction with other countermeasures

 High visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs

Recommendation

Based on the results of the NCHRP Report 562 analysis and the FHWA safety countermeasure matrix, a half signal is recommended at the intersection of SW Shaw Street/SW 160th Avenue to provide a fully

¹¹ A Pedestrian Hybrid Beacon (PHB, previously known as High-intensity Activate crossWalK (HAWK) signal) was not considered primarily because they are currently not allowed on Washington County facilities. Half signals were considered instead where a HAWK was identified for consideration by the FHWA guidance.

protected crossing for future trail users. Signal coordination with the existing traffic signal at the TV Highway/SW 160th Avenue intersection and adjacent railroad crossing must be explored (See Shaw Street Crossings and Railroad Operations Impacts section).

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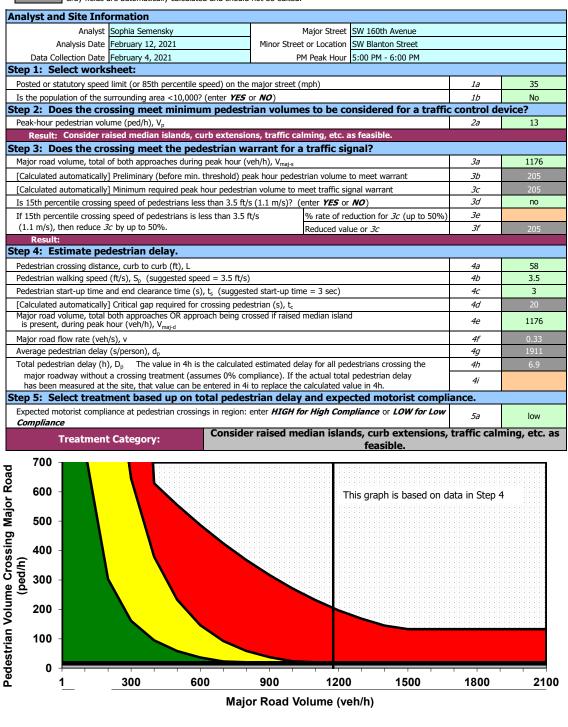
This spreadsheet is still under development, please inform TTI if errors are identified.

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This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

■Crosswalk ■Active/Enhanced ■Red ■Signal (proposed)

■ No Treatment

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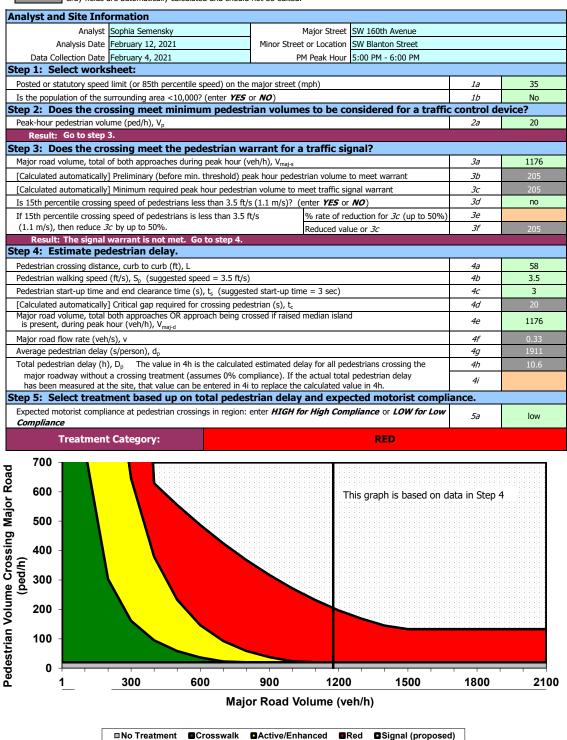
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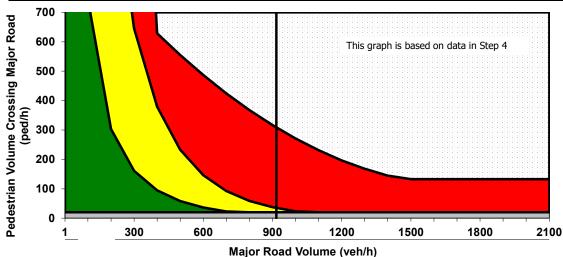
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nalyst and Site Info	rmation				
Analyst	Sophia Semensky	Major Stree	SW 160th Avenue		
Analysis Date	February 12, 2021	Minor Street or Location	SW Blanton Street		
Data Collection Date	February 4, 2021	PM Peak Hou	Hour 5:00 PM - 6:00 PM		
tep 1: Select works	heet:				
Posted or statutory speed	Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)			1a	35
Is the population of the su	is the population of the surrounding area <10,000? (enter YES or NO)			1b	No
tep 2: Does the cro	ssing meet minimum pedes	trian volumes to be o	considered for a traffic	control de	vice?
Peak-hour pedestrian volu	me (ped/h), V _p			2a	20
Result: Go to step 3	3.				
Step 3: Does the cro	ssing meet the pedestrian w	arrant for a traffic s	ignal?		
Major road volume, total o	of both approaches during peak hour	(veh/h), V _{maj-s}		3a	1176
[Calculated automatically]	Preliminary (before min. threshold) p	eak hour pedestrian volume	e to meet warrant	<i>3b</i>	205
[Calculated automatically]	Minimum required peak hour pedest	rian volume to meet traffic s	signal warrant	3c	205
Is 15th percentile crossing	speed of pedestrians less than 3.5 ft	/s (1.1 m/s)? (enter YES o	or NO)	3d	no
If 15th percentile crossing	speed of pedestrians is less than 3.5	ft/s % rate of r	eduction for 3c (up to 50%)	<i>3e</i>	
(1.1 m/s), then reduce 30	by up to 50%.	Reduced value or 3c		3f	205
	warrant is not met. Go to step 4.				
Step 4: Estimate ped	lestrian delay.				
Pedestrian crossing distan	Pedestrian crossing distance, curb to curb (ft), L		<i>4a</i>	58	
Pedestrian walking speed	Pedestrian walking speed (ft/s), S _p (suggested speed = 3.5 ft/s)		4b	3.5	
Pedestrian start-up time and end clearance time (s), t _s (suggested start-up time = 3 sec)			4c	3	
[Calculated automatically] Critical gap required for crossing pedestrian (s), t _c			4d	20	
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V _{maj-d}			4e	917	
Major road flow rate (veh/s), v			4f	0.25	
Average pedestrian delay	(s/person), d _p			4g	510
Total pedestrian delay (h), D _p The value in 4h is the calculated estimated delay for all pedestrians crossing the			4h	2.8	
major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4i			
Step 5: Select treatn	nent based up on total pede	strian delay and exp	ected motorist compli	ance.	
Expected motorist complia	ance at pedestrian crossings in region	: enter HIGH for High Col	mpliance or LOW for Low	5a	low
Compliance				34	1000
Treatment	Category:	AC [*]	TIVE OR ENHANCED		
700 600 -			This graph is based on d	ata in Step 4	



□ No Treatment □Crosswalk □Active/Enhanced □Red □Signal (proposed)

Because the volume in Step 4e is different from the volume in Step 3a, the graph may show a different result than the Treatment Category above.

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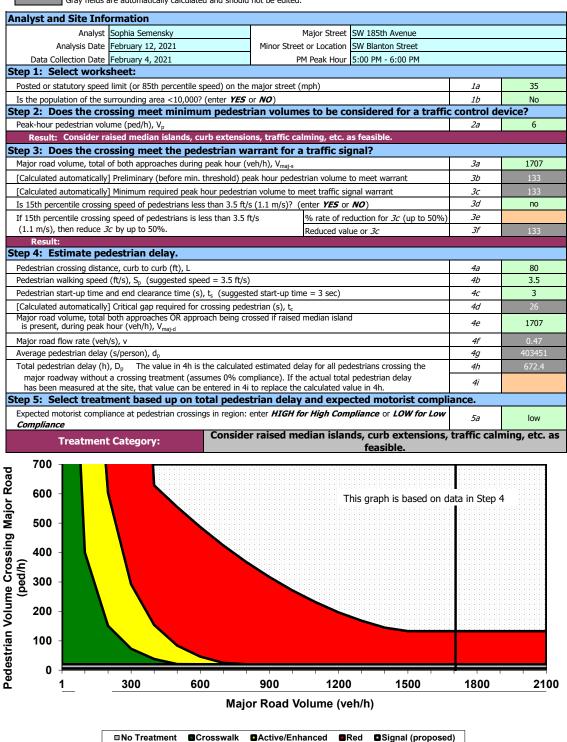
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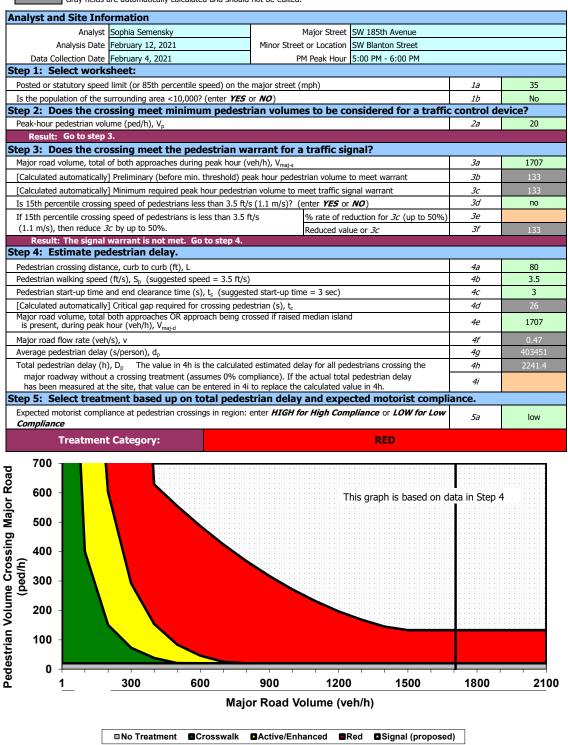
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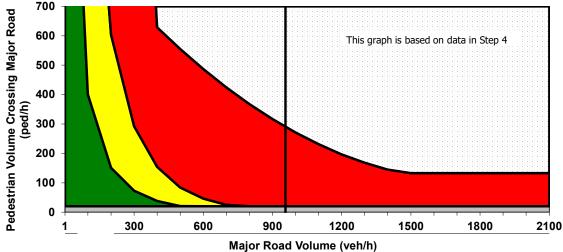
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nalyst and Site Info	ormation				
Analyst	Sophia Semensky	Major Street	SW 185th Avenue		
Analysis Date	February 12, 2021	Minor Street or Location	SW Blanton Street		
Data Collection Date	February 4, 2021	PM Peak Hour 5:00 PM - 6:00 PM			
Step 1: Select works	sheet:				
Posted or statutory speed	l limit (or 85th percentile speed) on the	major street (mph)		1a	35
	surrounding area <10,000? (enter YES of			1b	No
Step 2: Does the cro	ossing meet minimum pedestr	rian volumes to be co	onsidered for a traffic	control de	vice?
Peak-hour pedestrian volu	, , , , _p			2a	20
Result: Go to step					
Step 3: Does the cro	ssing meet the pedestrian wa	arrant for a traffic sig	gnal?		
Major road volume, total	of both approaches during peak hour (v	reh/h), V _{maj-s}		3a	1707
[Calculated automatically]] Preliminary (before min. threshold) pe	ak hour pedestrian volume	to meet warrant	<i>3b</i>	133
[Calculated automatically] Minimum required peak hour pedestria	an volume to meet traffic sig	gnal warrant	3c	133
Is 15th percentile crossing	g speed of pedestrians less than 3.5 ft/s	s (1.1 m/s)? (enter YES or	NO)	3d	no
If 15th percentile crossing	g speed of pedestrians is less than 3.5 ft	t/s % rate of re	duction for 3c (up to 50%)	3e	
(1.1 m/s), then reduce 3	c by up to 50%.	Reduced val	ue or <i>3c</i>	3f	133
	warrant is not met. Go to step 4.				
Step 4: Estimate per	destrian delay.				
Pedestrian crossing distar	nce, curb to curb (ft), L			4a	80
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)			4b	3.5	
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)			4c	3	
] Critical gap required for crossing pede			4d	26
Major road volume, total is present, during peak l	both approaches OR approach being cro hour (veh/h), V _{maj-d}	ossed if raised median islan	d	4e	956
Major road flow rate (veh/s), v		4f	0.27		
Average pedestrian delay (s/person), d _p			<i>4g</i>	3957	
Total pedestrian delay (h)	,, b	, ,		4h	22.0
major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4i			
Step 5: Select treatr	ment based up on total pedes	trian delay and expe	cted motorist complia	ince.	
Expected motorist compliance	iance at pedestrian crossings in region: e	enter HIGH for High Com	ppliance or LOW for Low	5a	low
Treatment	t Category:		RED		
	,,				
700					
600 -		Т	his graph is based on da	ata in Step 4	
600 - 500 -					
400					



□No Treatment ■Crosswalk ■Active/Enhanced ■Red ■Signal (proposed)

Because the volume in Step 4e is different from the volume in Step 3a, the graph may show a different result than the Treatment Category above.

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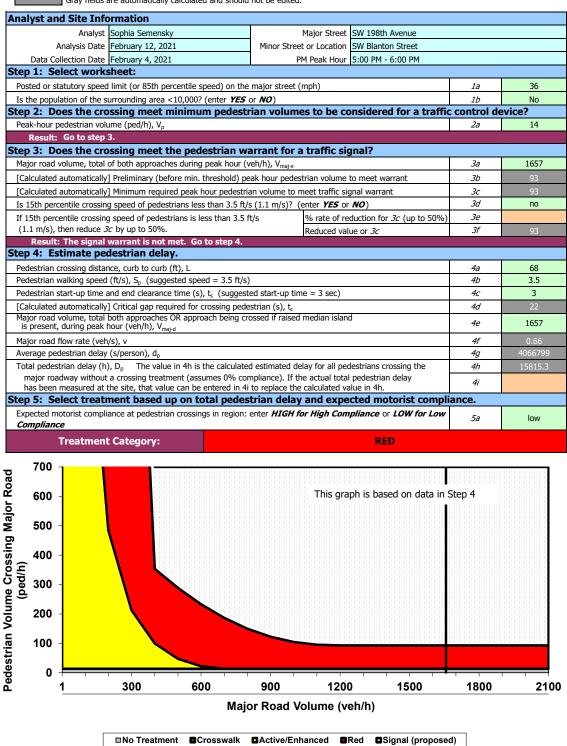
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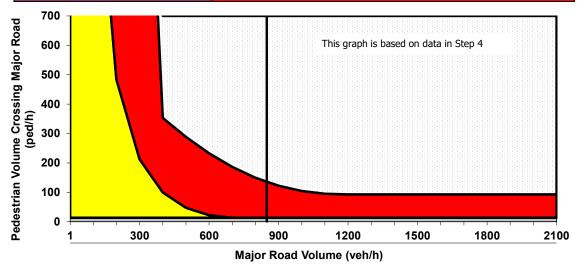
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Analyst and Site Information				
Analyst Sophia Semensky	Major Street	SW 198th Avenue		
Analysis Date February 12, 2021	Minor Street or Location	on SW Blanton Street		
Data Collection Date February 4, 2021	PM Peak Hour	Hour 5:00 PM - 6:00 PM		
Step 1: Select worksheet:				
Posted or statutory speed limit (or 85th percentile speed) or	the major street (mph)		1a	36
Is the population of the surrounding area <10,000? (enter)	'ES or NO)		1b	No
Step 2: Does the crossing meet minimum ped	estrian volumes to be co	onsidered for a traffic	control de	vice?
Peak-hour pedestrian volume (ped/h), V _p			2a	14
Result: Go to step 3.				
Step 3: Does the crossing meet the pedestrian	warrant for a traffic sign	gnal?		
Major road volume, total of both approaches during peak ho	ur (veh/h), V _{mai-s}		3a	1657
[Calculated automatically] Preliminary (before min. threshold	f) peak hour pedestrian volume	to meet warrant	<i>3b</i>	93
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant			3с	93
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter YES or NO)			3d	no
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s Wrate of reduction for 3c (up to 50%)			<i>3e</i>	
(1.1 m/s), then reduce <i>3c</i> by up to 50%.	Reduced val	· · · · · ·	3f	93
Result: The signal warrant is not met. Go to step	4.			
Step 4: Estimate pedestrian delay.				
Pedestrian crossing distance, curb to curb (ft), L			4a	68
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)			4b	3.5
Pedestrian start-up time and end clearance time (s), t _s (suggested start-up time = 3 sec)			4c	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t _c			4d	22
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V _{maj-d}			4e	849
Major road flow rate (veh/s), v			4f	0.34
Average pedestrian delay (s/person), d _p			4g	6005
Total pedestrian delay (h), D _p The value in 4h is the calculated estimated delay for all pedestrians crossing the			4h	23.4
major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.		4i		
Step 5: Select treatment based up on total pe	destrian delay and expe	cted motorist compli	ance.	
Expected motorist compliance at pedestrian crossings in reg <i>Compliance</i>	ion: enter HIGH for High Com	ppliance or LOW for Low	5a	low
Treatment Category:		RED		



□ No Treatment □ Crosswalk □ Active/Enhanced □ Red □ Signal (proposed)

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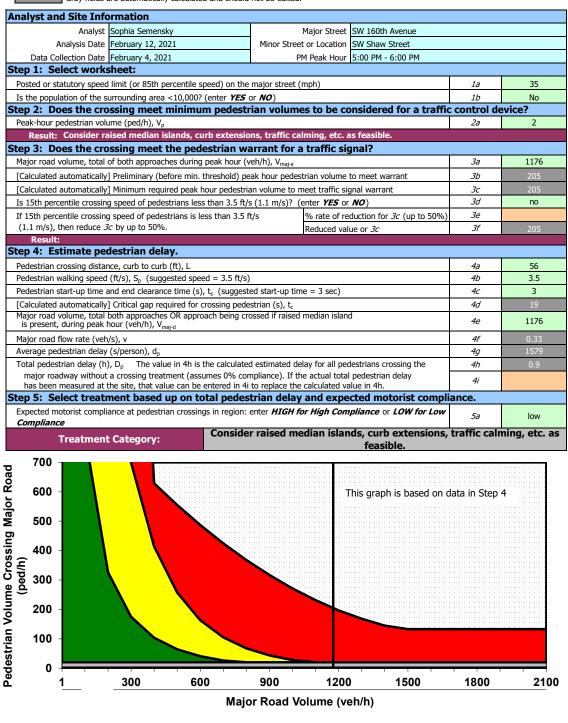
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■Crosswalk ■Active/Enhanced ■Red ■Signal (proposed)

■ No Treatment

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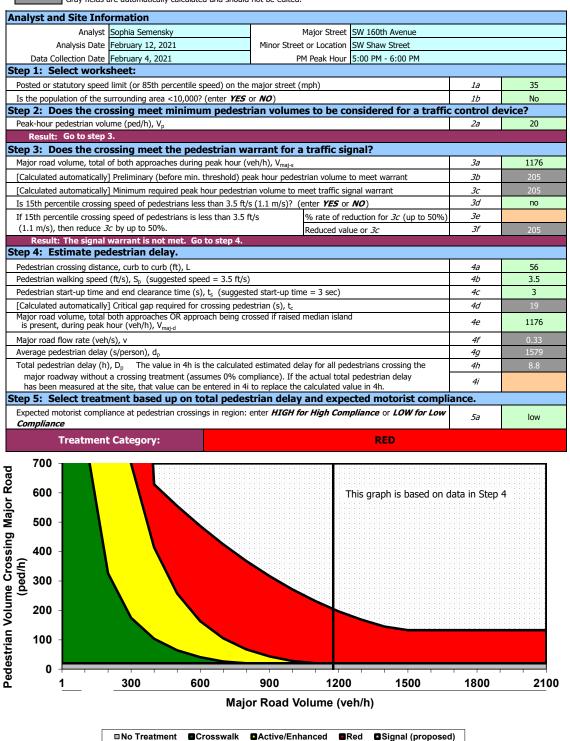
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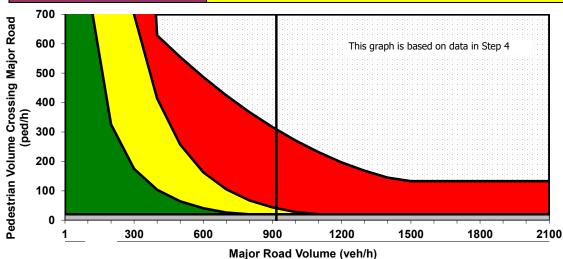
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nalyst and Site Informat	tion				
Analyst Sophia	Semensky	Major St	reet SW 160th Avenue		
Analysis Date Februa	ary 12, 2021	Minor Street or Loca	tion SW Shaw Street		
Data Collection Date Februa	ary 4, 2021	PM Peak H	lour 5:00 PM - 6:00 PM		
tep 1: Select worksheet	:				
Posted or statutory speed limit (or 85th percentile speed) or	n the major street (mph)		1a	35
Is the population of the surround	ding area <10,000? (enter	YES or NO)		1b	No
tep 2: Does the crossing	meet minimum ped	lestrian volumes to be	e considered for a traffic	c control de	vice?
Peak-hour pedestrian volume (pe	ed/h), V _p			2a	20
Result: Go to step 3.					
tep 3: Does the crossing	meet the pedestria	n warrant for a traffic	signal?		
Major road volume, total of both	approaches during peak ho	our (veh/h), V _{maj-s}		3a	1176
[Calculated automatically] Prelin	ninary (before min. threshol	d) peak hour pedestrian volu	ime to meet warrant	3b	205
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant			3с	205	
Is 15th percentile crossing speed	d of pedestrians less than 3.	.5 ft/s (1.1 m/s)? (enter YE	S or NO)	3d	no
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s % rate of reduction for <i>3c</i> (up to 50%)		<i>3e</i>			
(1.1 m/s), then reduce 3c by up to 50%. Reduced value or 3c			3f	205	
Result: The signal warra		4.			
tep 4: Estimate pedestri	ian delay.				
Pedestrian crossing distance, curb to curb (ft), L			4a	56	
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)			4b	3.5	
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)			4c	3	
[Calculated automatically] Critical gap required for crossing pedestrian (s), t _c			4d	19	
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V _{maj-d}			4e	917	
Major road flow rate (veh/s), v			4f	0.25	
Average pedestrian delay (s/person), d _p			<i>4g</i>	439	
Total pedestrian delay (h), D _p The value in 4h is the calculated estimated delay for all pedestrians crossing the			4h	2.4	
major roadway without a crossing treatment (assumes 0% compliance). If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.			<i>4i</i>		
tep 5: Select treatment	based up on total pe	edestrian delay and e	xpected motorist compli	iance.	
Expected motorist compliance at Compliance	t pedestrian crossings in reg	gion: enter <i>HIGH for High</i> (Compliance or LOW for Low	5a	low



□ No Treatment □Crosswalk □Active/Enhanced □Red □Signal (proposed)

Because the volume in Step 4e is different from the volume in Step 3a, the graph may show a different result than the Treatment Category above.

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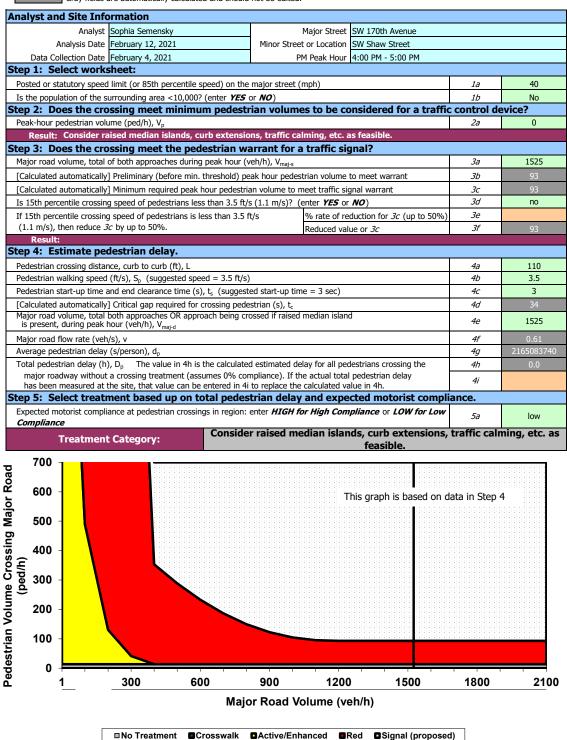
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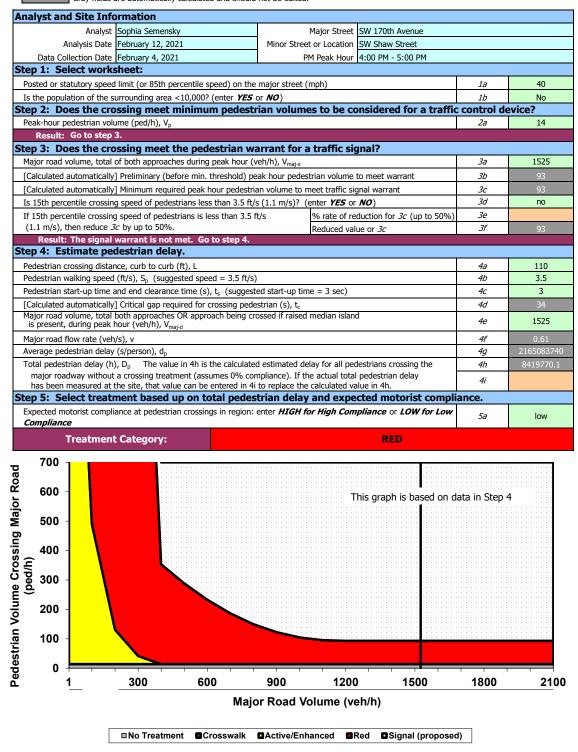
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nalyst and Site Infor	mation				
Analyst S	ophia Semensky	Major Street SW	170th Avenue		
	ebruary 12, 2021	Minor Street or Location SW			
Data Collection Date February 4, 2021 PM Peak Hour 4:00 PM - 5:00 PM					
tep 1: Select worksh	, , , , , , , , , , , , , , , , , , ,	THI Cak Hour T.C	3.00111		
	mit (or 85th percentile speed) on t	he major street (mnh)		1a	40
	rounding area <10,000? (enter YES	• • • • • • • • • • • • • • • • • • • •		1b	No
	sing meet minimum pedes	,	idered for a traffic		
Peak-hour pedestrian volum		teriair voidines to be cons	lacica for a trainic	2a	14
Result: Go to step 3.	c (ped/11), v _B			20	
	sing meet the pedestrian v	warrant for a traffic signa	12		
	both approaches during peak hour		•••	<i>3a</i>	1525
	Preliminary (before min. threshold)	, , , ,, , ,	neet warrant	3b	93
					93
- '-	Minimum required peak hour pedest speed of pedestrians less than 3.5 f	•		3c 3d	no
	'	, , , , ,	,	3e	110
(1.1 m/s), then reduce 3c	peed of pedestrians is less than 3.5		tion for <i>3c</i> (up to 50%)	3f	02
, ,,,	arrant is not met. Go to step 4.	Reduced value of	or 3C	31	93
tep 4: Estimate pede					
Pedestrian crossing distance	•			4a	110
•	t/s), S_n (suggested speed = 3.5 ft)	/s)		4b	3.5
	· /· / · · ·			4c	3.3
Pedestrian start-up time and end clearance time (s), t _s (suggested start-up time = 3 sec)			4d	34	
[Calculated automatically] Critical gap required for crossing pedestrian (s), t _c Major road volume, total both approaches OR approach being crossed if raised median island			-		
is present, during peak ho				<i>4e</i>	836
Major road flow rate (veh/s), v			4f	0.33	
Average pedestrian delay (s/person), dp			4g	260393	
Total pedestrian delay (h),	D _p The value in 4h is the calcula	ted estimated delay for all pedest	rians crossing the	4h	1012.6
	crossing treatment (assumes 0% c			4 <i>i</i>	
	site, that value can be entered in	·			
	ent based up on total pede		•	ance.	
	ce at pedestrian crossings in region	n: enter HIGH for High Complia	ince or LOW for Low	5a	low
Compliance					
Treatment (ategory:		RED		
700			ekenedekenedekenedekenedekenedekenedek	161616161616161616161	
600 -					
		This	graph is based on d	ata in Step 4	4
500					
500 -					
500 -					
400 -					
500 - 400 - €					
400 - (4) _{po} 300 -					
400 - 400 - 300 -					
400 - (400 - 300 -					
400 - (400 - 200 -					
400 - (400 - 300 - 200 -					
400 - 400 300 -					

Major Road Volume (veh/h)

1200

1500

1800

2100

900

300

600

Because the volume in Step 4e is different from the volume in Step 3a, the graph may show a different result than the Treatment Category above.

This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in

conjunction with, and not independent of, Appendix A documentation.

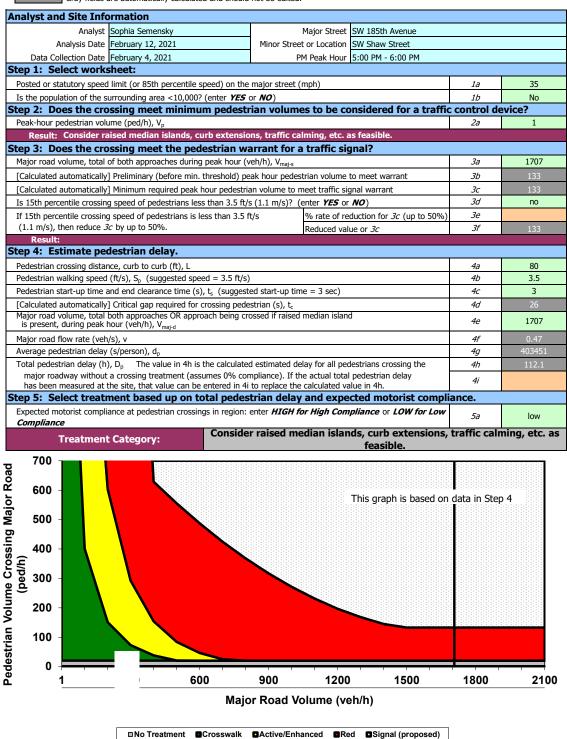
This spreadsheet is still under development, please inform TTI if errors are identified.

Blue fields contain descriptive information.

Green fields are required and must be completed.

Tan fields are adjustments that are filled out only under certain conditions (follow instructions to the left of the cell).

Gray fields are automatically calculated and should not be edited.



This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in

conjunction with, and not independent of, Appendix A documentation.

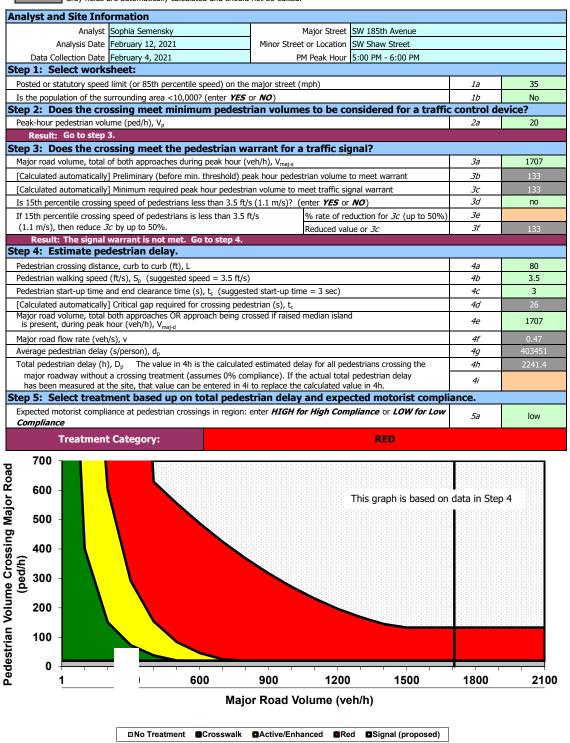
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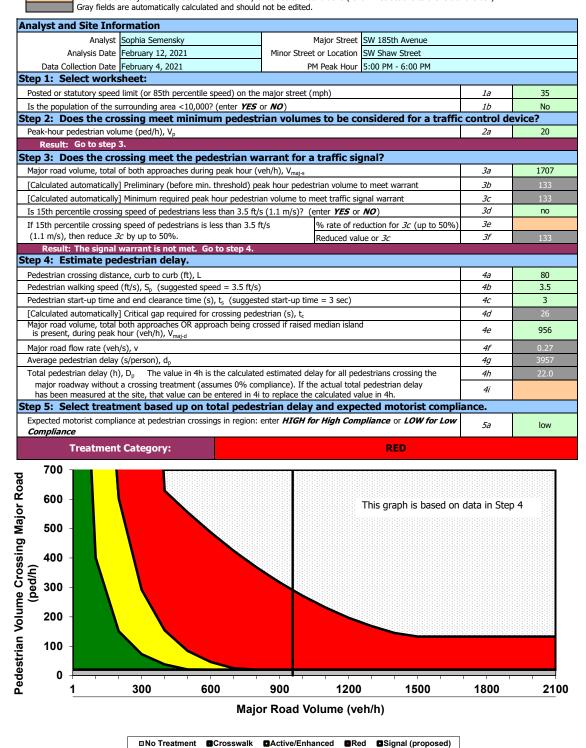
conjunction with, and not independent of, Appendix A documentation.

This spreadsheet is still under development, please inform TTI if errors are identified.

Blue fields contain descriptive information.

Green fields are required and must be completed.

Tan fields are adjustments that are filled out only under certain conditions (follow instructions to the left of the cell).



Because the volume in Step 4e is different from the volume in Step 3a, the graph may show a different result than the Treatment Category above.

Appendix E Railroad and Half Signal Conflict Visual

Figure E1: Potential Half Signal Equipment Placement – SW Shaw Street/185th Avenue Southbound

185th Ave - Southbound

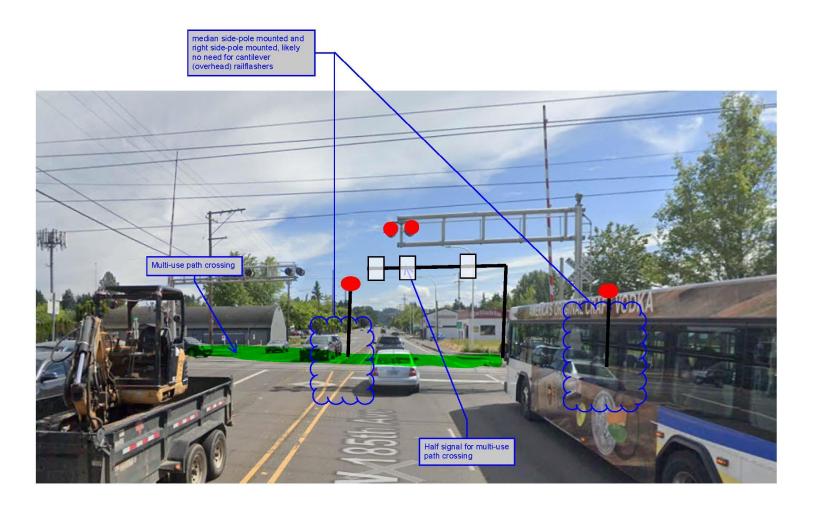
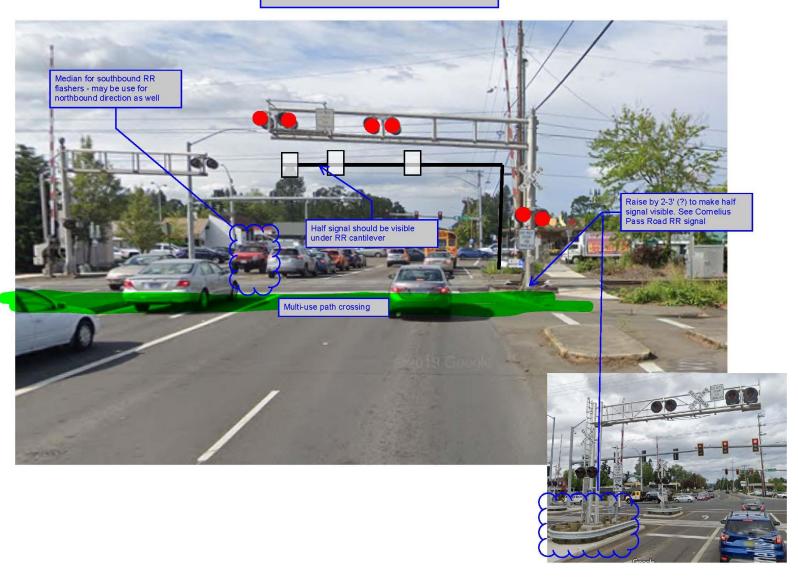


Figure E2: Potential Half Signal Equipment Placement – SW Shaw Street/185th Avenue - Northbound

185th Ave - Northbound





MEMORANDUM

Date: June 16, 2021 Project #: 23021.002

To: Dyami Valentine, Reza Farhoodi, Washington County

Hector Rodriguez-Ruiz, John Russell, Oregon Department of Transportation

From: Nicholas Gross, Juan Barajas, Sophia Semensky, Susan Wright, PE, PMP

Project: TV Regional Trail Concept Plan

Subject: Preferred Alignment and Conceptual Trail Design Memorandum

PURPOSE

This memorandum describes the conceptual design and cost estimate for the preferred alternative of the Tualatin Valley (TV) Regional Trail, including intersection improvements and connections to transit stops and stations.

The conceptual design was developed based on national and local guidance for low-stress facilities for people walking and biking; consideration of safety and comfort of the facility; impacts to traffic on the adjacent roadway networks; impacts to the right-of-way (ROW); and priority connections to amenities including transit, destinations, other trails, and nearby neighborhoods. The concept design includes enhanced crossing treatments at intersections along the regional trail alignment and strategies to improve safety at conflict points.

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Attachment B	Blanton Street Cost Estimate	
Attachment C	Shaw Street Concept Overview	
Attachment D	Shaw Street Concept Design	
Attachment E	Shaw Street Cost Estimate	

FILENAME: H:\23\23021 - TRANSPORTATION AND LAND USE PLANNING\002 - TUALATIN VALLEY REFINEMENT PLAN\TASK 5 PREFERRED ALIGNMENT AND CONCEPTUAL TRAIL DESIGN\PREFERRED ALIGNMENT AND CONCEPT DESIGN\PREFERRED ALIGNMENT
AND CONCEPT DESIGN - FINAL DOCX

BACKGROUND

The TV Trail Alignment Alternatives and Evaluation Memorandum assessed three potential trail alignments with the purpose of identifying a preferred alignment to be advanced into the concept design phase. Based on the trail alignment evaluation, feedback provided by the technical advisory committee (TAC), stakeholder advisory committee (SAC), focus group discussions as well as input received as part of the online open house #1, the following alignments were selected to be advanced into the concept design phase.

- SW Blanton Street
- SW Shaw Street

SW Blanton Street was advanced due to its strong connectivity to community destinations and existing trail facilities in the area. SW Shaw Street was advanced for further analysis due to its proximity to TV Highway, transit, and minimal driveway conflict points.

Safe, direct, and convenient crossings are essential in developing a regional trail facility. Both alignments were closely evaluated with enhanced crossing analyses conducted to determine appropriate treatments



Westside Trail at SW Blanton Street east of SW 160th Avenue



SW Blanton Street in South Hillsboro west of SW 209th Avenue Looking Westbound

based on roadway context as described in detail within the *Draft Traffic Analysis Memorandum*.

Based on the analysis, it was determined that the crossings of major intersections along SW Shaw Street would likely need to occur at TV Highway in the near-term due to the challenges and constraints associated with implementing the necessary enhanced crossing infrastructure as it relates to railroad and TV Highway proximity.

As a result, SW Blanton Street was selected as the preferred near-term alignment to be advanced. This alignment has challenges, including a high number of driveways and streets on both sides of the road and ROW needs. The following sections describe the strategies to mitigate these challenges on SW Blanton Street. Opportunities for segment enhancements for SW Shaw Street and long-term improvements to the crossings are included (see Attachments C and D).

SW BLANTON STREET - CONCEPT OVERVIEW

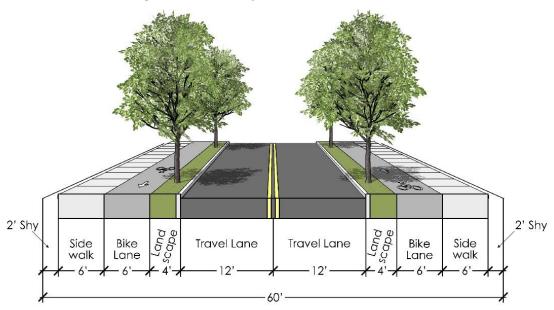
The concept design for SW Blanton Street has been developed from SW 209th Avenue to the Westside Regional Trail, located approximately 500 feet east of the SW 160th Ave/SW Blanton Street intersection. The planned ROW for this corridor is 74-feet west of SW 170th Avenue as identified in the Washington County Transportation System Plan (TSP); however, the proposed typical section for a regional trail on SW Blanton Street is a 60-foot cross section to minimize ROW impacts. The 60' typical sections provides potential space for a 14-foot center-turn lane within a 74-foot total ROW in specific locations where needed. Similarly, the 60-foot typical cross section also allows for on-street parking to be provided in addition to the typical 60-foot section while still saying within a 74 feet total ROW. Additional ROW for parking could potentially be dedicated as the area redevelops.

Cross-section

The proposed cross-section provides a low-stress walking and biking facility, comfortable for all ages and abilities. It includes 6-foot bike lanes and 6-foot sidewalks on both sides of the roadway, separated by a 4-foot landscape buffer. The curb-to-curb cross section includes two 12-foot travel lanes. A 2-foot shy distance space is located behind the back edge of sidewalks for utilities. Figure 1 illustrates the proposed regional trail cross section on SW Blanton Street.

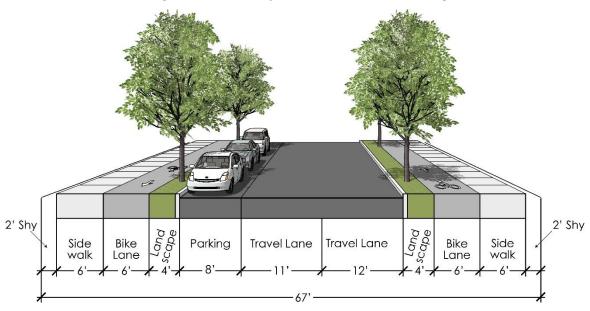
If the 2-foot shy distance is not needed on both sides of the roadway, the exact space allocation could be modified to increase or decrease the travel lane, landscape buffer, bike lane or sidewalk.

Figure 1: SW Blanton Street – Regional Trail Concept Cross Section



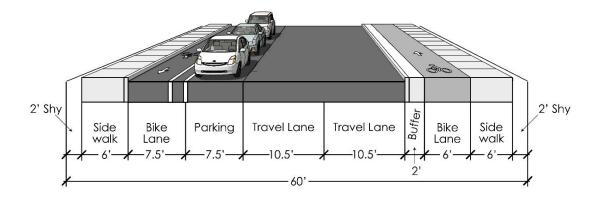
On-street parking may be desired in some areas or all of the corridor. On-street parking was included on the north side of SW Blanton Street in a limited area of the corridor where ROW is available. Figure 2 illustrates the proposed cross-section with parking on one side. This cross-section can be accommodated in areas of the corridor that have additional ROW or where the full 74-foot TSP ROW could be acquired on one side of the roadway resulting in 37' of ROW on either side of the centerline rather than 30' of ROW on either side of the centerline. Parking could also be provided on both sides of the roadway if the full TSP ROW is available on both sides of the roadway over time as properties redevelop.

Figure 2: SW Blanton Street - Regional Trail Concept Cross Section With Parking on One Side



Narrower width elements may be feasible as shown in Figure 3. If parking were to be provided on only one side of the road for the entire corridor, the roadway centerline could shift and require only 33.5' of ROW from each side of the ROW centerline.

Figure 3: SW Blanton Street – Regional Trail Concept Cross Section With Parking on One Side – Narrow Lanes



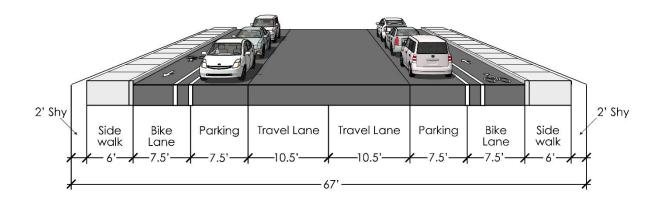
The buffer area would serve as a paved area for car passengers, protect bicyclists from car doors, and serve as the space for driveway aprons.



Example Separated Bike Lane with On-street Parking - Western Ave - Cambridge, MA

On-street parking could potentially be provided on both sides of the road within a 67' ROW with narrow lanes and no landscape buffer as shown in Figure 4 and either be at the roadway grade or a different grade as shown in the following Beacon Street example.

Figure 4: SW Blanton Street - Regional Trail Concept Cross Section Parking Separated Bike Lanes



Due to a high number of driveways resulting in potential conflict points for people walking and biking, the separated bike lanes were selected as a preferred alternative compared to a shared-use path and are expected to better meet drivers' expectations by reducing the potential for counterflow biking movements at turning movement conflict points. The bike lane can be further identified with striping as shown in the Western Avenue example. Separated bike lanes also reduce conflicts between people walking and people biking compared to shared use paths by providing dedicated spaces for each mode; further increasing the user experience and level of comfort.

Although not separated horizontally, an on-street bike lane could have vertical separation as well as different colors or textures as shown in the example below.



Example Grade-separated Bike Lane - Beacon Street - Somerville, MA

If separated bike lanes are found to be undesirable due to the high number of driveways in the corridor, on-street alternatives could be further explored but would require a change in roadway character and functionality, reducing vehicular speeds and volumes along SW Blanton Street.

Concept Design Considerations

Several factors were considered during the development of the concept plan for SW Blanton Street including design guidance from the *American Association of State Highway and Transportation Officials (AASHTO)*, ROW encroachment, driveway conflict points, priority destinations, on-street parking, safety and security, and intersection treatments. Figure 8 summarizes the key considerations for each segment along SW Blanton Street. Figure 9 summarizes the recommended treatments and considerations for the major intersections. Attachment A provides the concept design with the 60' typical cross-section throughout most of the corridor to document the minimum potential impact. Addition of parking throughout the corridor would increase the cross-section footprint and impact.

AASHTO Guide for the Development of Bicycle Facilities

The AASHTO Guide for the Development of Bicycle Facilities, 2012 provides guidance for the design of onroad bike facilities and the design of shared use paths; however, it <u>does not provide guidance or considerations for separated bike lanes</u>. Furthermore, AASHTO does not provide quantitative guidance on when or when not to recommend bicycle facilities based on number of driveways. Based on the guidance provided for shared use paths, AASHTO recommends the following:

- Paths may be appropriate along sections of roadway where there are few streets and/or driveway crossings, given appropriate separation between facilities and attention to reducing crashes at junctions (consider context sensitive design treatments – raised crossings).
- In some situations, it may be better to place one-way sidepaths on both sides of the street or highway, directing wheeled users to travel in the same direction as adjacent motor vehicle traffic. Clear directional information is needed if this type of design is used, as well as appropriate intersection design to enable bicyclists to cross to the other side of the roadway.
- This can reduce some of the concerns associated with two-way sidepaths at driveways and intersections; however, it should be done with the understanding that many bicyclists will ignore the directional indications if they involve additional crossings or otherwise inconvenient travel patterns.

Based on this guidance, the proposed concept design provides directional bike lanes that are between the sidewalk and the street to maximize visibility for drivers potentially exiting driveways. The concept also includes recommendations for raised crossings at local street crossings. However, frequent or closely spaced driveways can undermine the effectiveness of separated bike lanes (both in terms of comfort and safety). In the case of SW Blanton Street, prioritizing separation of modes and eliminating or reducing access points (conflicts) is essential to creating an environment that is comfortable for all ages and abilities. Opportunities to consolidate driveways and narrow access points where possible can reduce exposure.

Right-of-Way

As described previously, a 74-foot ROW is identified in the Washington County TSP west of SW 170th Avenue, while existing ROW is approximately 55-foot throughout much of the corridor. The 60-foot cross section is recommended as the typical section primarily to minimize ROW needs and allow space for center-turn lanes or on-street parking to be provided within a 74-foot right-of-way where needed or desired. The 60' cross-section generally maintains the centerline of the 55-foot ROW and encroaches on approximately 160 or more tax lots combined on the north and south sides of SW Blanton Street. While this increases the number of properties impacted, it minimizes impacts to houses and helps maintain

adequate driveway depth for single-family houses along the corridor. As described previously, if a typical cross-section with parking on one-side throughout the corridor was desired, a 65' ROW could be adopted throughout the corridor requiring approximately 5' from each side of the roadway. Additional ROW could be needed up to the 74' to accommodate left-turn lanes at intersections. If a full 74' ROW was pursued throughout the corridor, approximately 80 or more properties could lose a functioning driveway (a driveway of less than 25' deep) or have their building impacted.



Improved Section of SW Blanton Street

SW Blanton Street

Priority Destinations/Connections

Priority destinations for the SW Blanton Street alignment include the Westside Trail east of SW Blanton Street/SW 160th Avenue; the existing City of Hillsboro separated bike lanes on SW Blanton Street west of SW 209th Avenue; transit stops at SW Blanton Street/SW 198th Avenue; and the Intel campus. Each of the major cross-streets also provides a potential connection to transit on TV Highway.

Driveway Conflict Points

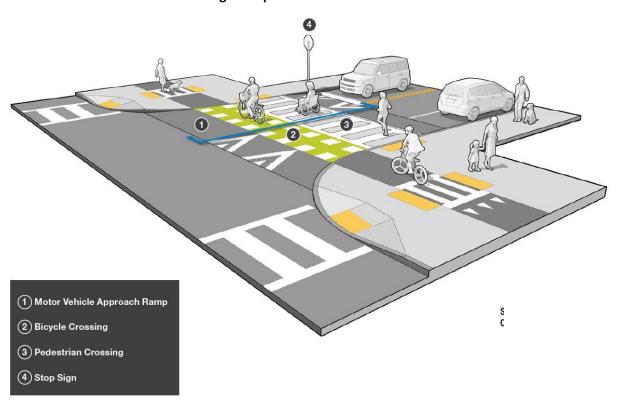
There are a number of driveways on the north and south sides of SW Blanton Street throughout the corridor. In addition, there are several unsignalized minor streets throughout the corridor. East-west crosswalks are recommended to be striped at these intersections, and treatments for people walking should be considered at major driveways and intersections as described in the section below.

Raised Side Street Crossings

Raised side street crossings are design treatments that reduce exposure at driveways and side street crossings when approaching high vehicle volume locations of walking and biking crossings.

The fundamental design elements of a raised side street crossing include motor vehicle approach ramps, dedicated crossings zones for people walking and biking, and stop signage and striping. Exhibit 1 illustrates an example of a raised side street crossing.

Exhibit 1 Raised Side Street Crossing Example¹



Opportunities to implement raised side street crossings along Blanton Street are applicable at minor street and high-volume driveway approaches (not single-family residential driveways). These include, but are not limited to:

- SW 165th Avenue
- SW 173th Avenue
- SW 174th Avenue
- SW 175th Avenue
- SW 178th Avenue

- SW 184th Avenue
- SW 188th Avenue
- SW 193th Avenue
- SW 203rd Avenue
- SW 205th Avenue

On-Street Parking

Under existing conditions, minimal on-street parking occurs along the corridor west of SW 185th Avenue. More on-street parking occurs east of SW 185th Avenue due to greater amounts of multi-family housing and improved sections of roadway that provide width for on-street parking. Parking is not included in the 60-foot typical cross section, but it can be accommodated where the 74-foot ROW can be acquired (as per the Washington County TSP). An example section of potential on-street parking is shown in the draft concept design in Attachment A along the north side of SW Blanton Street between SW 185th Avenue and SW 170th Avenue (see Figures B-8 through B-13) per the cross-section shown in Figure 2.

Safety and Security

A key element of the concept design is safe crossings at major streets. Half signals were identified as preferred treatments at the major unsignalized intersections along SW Blanton Street to facilitate protected crossings for people walking and biking with consistency throughout the corridor.

Lighting is a key element of a secure roadway and regional trail. The roadway and regional trail should be adequately lit to enhance safety and security at night. In addition, pedestrian scale should be considered for the regional trail alignment due to the frequency of driveways.

Natural Resource Enhancements and Stormwater Management

Four-foot planter strips are included on each side of the road, providing an opportunity for stormwater management within the corridor.

Intersections

There are five major intersections along the SW Blanton Street alignment that were evaluated to determine the recommended level of separation and type of enhanced crossing treatments based on national and local guidance. These include:

- SW Blanton Street/SW 209th Avenue signalized intersection
- SW Blanton Street/SW 198th Avenue off-set stop-controlled intersections
- SW Blanton Street/SW 185th Avenue off-set stop-controlled intersections
- SW Blanton Street/SW 170th Avenue signalized intersection
- SW Blanton Street/SW 160th Avenue- stop-controlled intersection

Based on the technical analysis conducted as part of the *Traffic Analysis Memorandum*, half-signals are recommended at the existing unsignalized intersections. Alternatives to half-signals are described in the following figures and sections and are detailed in the Attachment A draft concept design. The half signals are currently shown without left-turn lanes although an example of turn-lanes is shown in Figures 5-7.

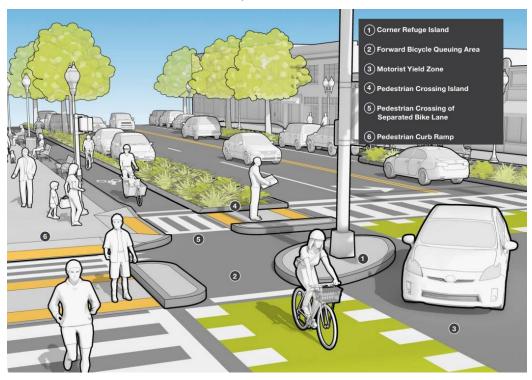
Protected Intersections

Protected intersections aim to minimize exposure to conflicts by separating modes, increasing visibility, and reducing speeds at intersection approaches.

The fundamental design elements of a protected intersection include a corner refuge islands allowing the bike lane to be physically separated at the potential point of turning (right-turn) conflict, dedicated bicycle queuing areas in advance of the vehicular stop bar to increase visibility of the bicyclist, pedestrian crossings islands, and pedestrian crossings of the separated bike lanes. Exhibit 2 illustrates a protected intersection concept.

Opportunities to implement protected intersection design treatments along Blanton Street are most applicable at the signalized intersections of SW 209th Avenue and SW 170th Avenue. At signalized intersections, bike signals should be explored to provide dedicated phasing for people biking across the intersection.

Exhibit 2 Protected Intersection Example¹



Left-Turn Lanes

The *Traffic Memorandum* documents analysis of operations and queueing at the stop-controlled major intersections where half-signals are recommended. The existing stop-controlled intersections do not have separate left-turn lanes. Based on the results of the analysis, adding left-turn lanes at all of these intersections is not recommended. Adding left-turns should be decided on a case-by-case basis as the left-turn is the critical movement and the capacity constraint and queuing is shifted to the left-turn lane from the shared lane with minimal benefit to the right-turn and through movements as the left-turn queues are likely to spill back into the through lane. This is an existing condition that will not be significantly impacted by the addition of the regional trail. The half signals when actuated provide gaps in traffic for turning movements after the pedestrian has cleared the intersection. Left-turn lanes should be further considered if any of these intersections becomes signalized in the future.

An example of the impacts of providing left-turn lanes at the proposed half-signals within a 60' ROW is provided in Figure 5 with SW 198th Avenue/SW Blanton Street as an example. Providing left-turn lanes would increase the crossing distance for pedestrians navigating between the off-set intersections, may increase the use of SW Blanton Avenue by vehicles, and would reduce the shared space for bicycles and pedestrians approaching the intersection to 8-9 feet instead of the desired 12 feet unless additional right-of-way was acquired. To increase this shared space to 10-feet, the drive lanes could be narrowed.

Kittelson & Associates, Inc. Portland, Oregon

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¹ Source: MassDOT Separated Bike Lane Planning & Design Guide: Chapter 4, Intersection Design

Alternatively, options to bring bikes onto the thru/right lane could be explored, maintaining a wide sidewalk for pedestrians. This option would be coupled with appropriate signage and wayfinding, giving people biking the right-of-way. As a potential regional trail route, SW Blanton Street should be kept low-volume. Increasing capacity with a left-turn lane could encourage additional thru-traffic. Figures 6 and 7 show potential cross-sections for left-turn lanes at major intersections with typical lane widths and narrow lane widths, respectively. The narrower lane widths would allow for greater space for bicycles and pedestrians all the way to the intersections.

Figure 5: SW Blanton Street/ SW 198th Avenue Left-Turn Lane Example

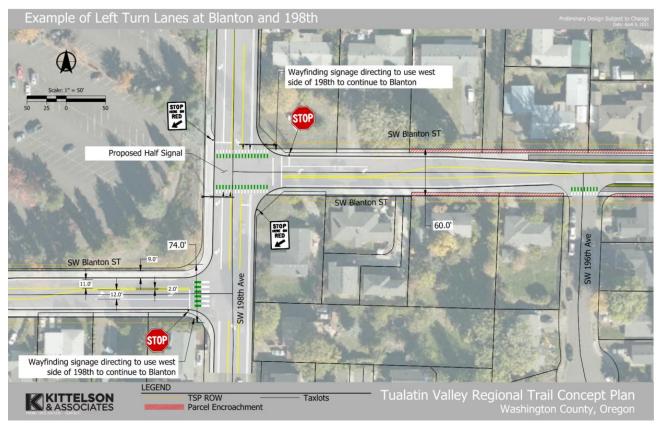


Figure 6: SW Blanton Street – Regional Trail Concept Cross Section at Intersection With Left-turn Lane

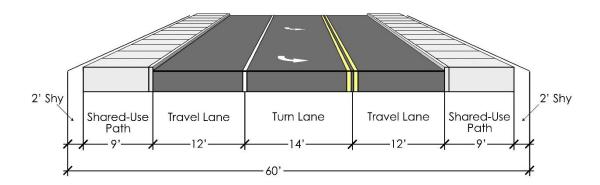
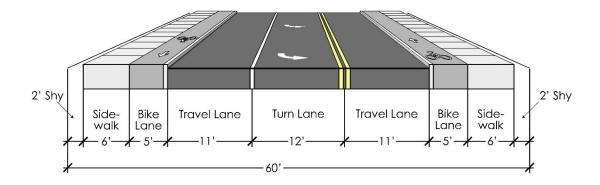
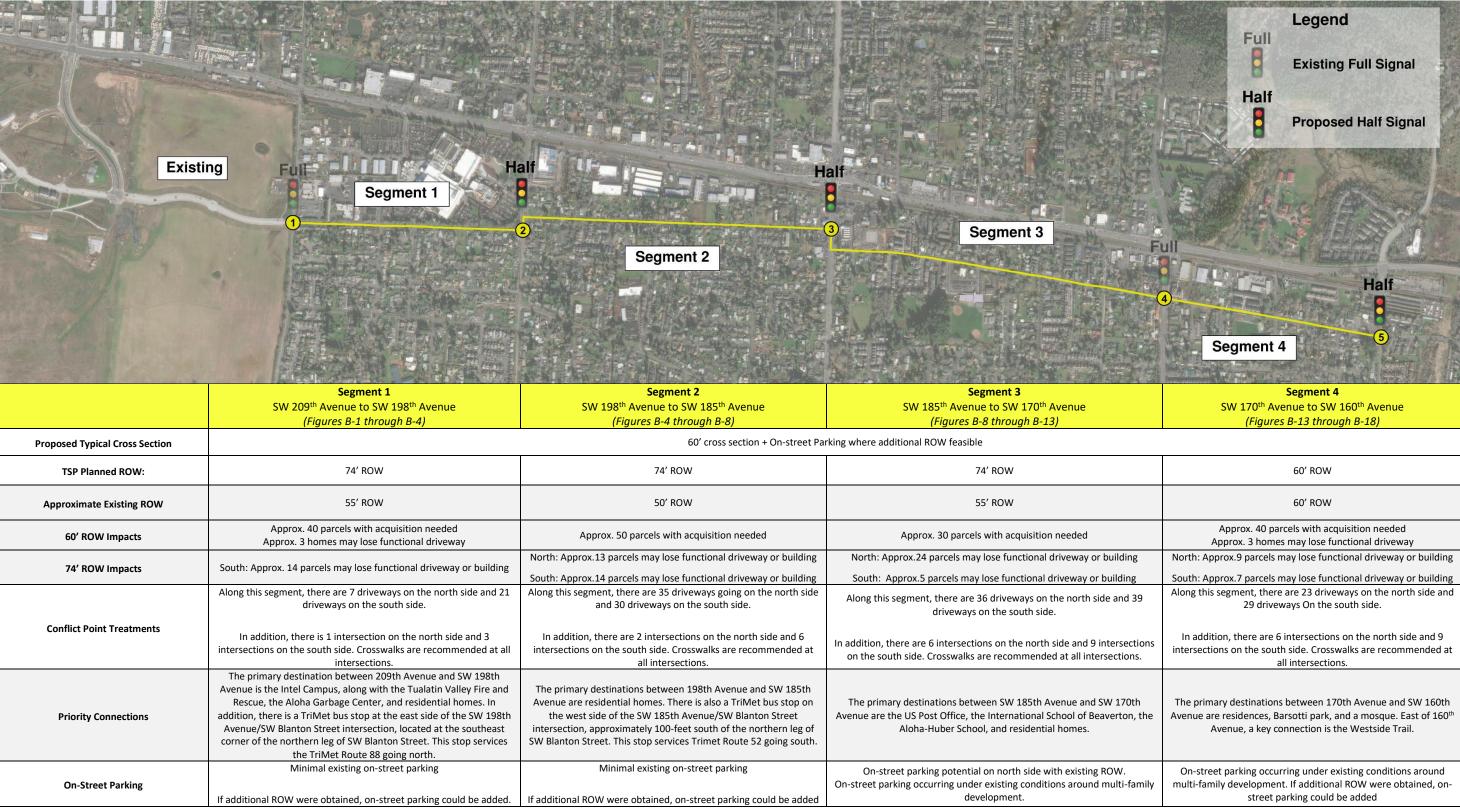


Figure 7: SW Blanton Street – Regional Trail Concept Cross Section at Intersection With Left-turn Lane – Narrower Lanes/Wider Bike Lane and Sidewalk



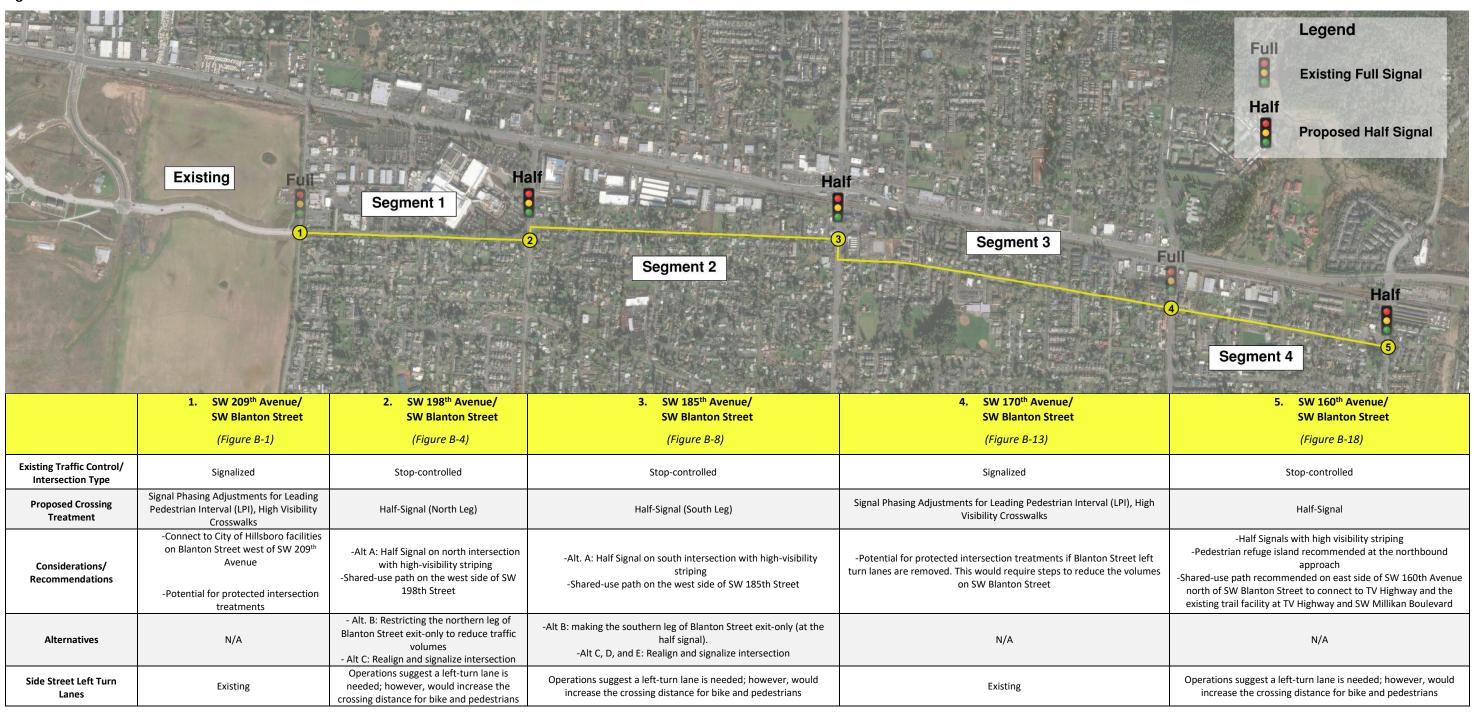
The need for center left-turn lanes along the corridor was also evaluated as part of the *Traffic Memorandum* and a continuous center left-turn lane was not found to be warranted under existing conditions. Left-turn lanes are not anticipated to be needed at any of the local streets or major driveways (unless the left-turn is over approximately 100 vehicles per hour). Left-turn lanes should be provided along the corridor only where specifically warranted in the future.

Figure 8: SW Blanton Street – Segments



^{*}Parcels counted if building falls within 74' ROW or if ROW reduces driveway to less than $^{\sim}25'$

Figure 9: SW Blanton Street – Intersections



Intersection Alternatives

The following describes the alternative intersection treatments that were considered for the intersections where multiple alternatives were considered as identified in Figure 9.

Blanton Intersection 2: SW 198th Avenue/SW Blanton Street

The SW 198th Avenue/SW Blanton Street intersection is an off-set stop-controlled intersection with no crosswalks. This off-set intersection is part of the Blanton Street alignment, making it a challenging transition for the trail.

SW 198th Avenue is currently under construction from SW Farmington Road to TV Highway. As part of the improvements, a four-lane cross-section north of the southern leg of Blanton Street will be constructed, with an 11-foot southbound right-turn lane, two 11-foot travel lanes, a 13-foot center turn lane, and a 5-foot bike lane on the east side of SW 198th Avenue. A three-lane cross section will be maintained south of the southern leg of Blanton Street. The following describes three potential alternatives for this intersection. The concept design in Attachment A (page B-4) documents Alternative A (Maintain off-set intersections).

Alternative A (Maintain Off-set Intersections, Construct Half-Signal)

Alternative A is to maintain the existing off-set intersections and provide a protected crossing for trail users via a half-signal at the northern intersection. High visibility crosswalks would be provided on both sides of the intersection for people biking in either direction. This alternative is shown in the concept

design in Attachment A. The off-set intersections would be connected for people walking and biking via a shared-use path on the west side of SW 198th Street.

This configuration will allow people walking and biking traveling eastbound to cross north on the southern Blanton Street intersection at a crosswalk, travel north on the shared-use trail along the west side of SW 198th Avenue, and use the half signal to cross SW 198th Avenue at the northern Blanton Street intersection. People heading westbound would cross at the half-signal, travel south



Offset Intersections at SW Blanton Street/SW 198th Avenue – Looking West

on the shared-use path, and then turn right onto sidewalk or bike facilities at the southern Blanton Street intersection.

Alternative B (Additional Turn Restrictions)

Alternative B proposes maintaining the recommendations outlined in Alternative A, but also making the northern leg of Blanton Street exit-only (at the half signal). Therefore, vehicles could turn right or left out of Blanton Street, but only people walking and biking would be permitted to enter. This would reduce turning conflicts with bikes and pedestrians at the half signal. In addition, this would reinforce SW Blanton Street as regional trail route by limiting the use of the street as a thru route for vehicles. This type of treatment at multiple locations throughout the corridor would reduce the volume of vehicles using SW Blanton Street and could create opportunities for a low-stress bike facility to be located on the street below the curb instead of separated behind the curb. This would reduce costs and reduce driveway conflicts.

Alternative C (Realign West Leg of Blanton Street)

Alternative C proposes realigning and signalizing the off-set legs of SW Blanton Street at SW 198th Avenue. Concept designs for this were developed as part of the improvements under construction on SW 198th Avenue; however, they were not incorporated into the construction project. The off-set intersections were proposed to be aligned by curving the west leg up through Intel's parking lot. The concept design is shown in Exhibit 3.

Alternative C would provide a direct connection for the regional trail users, dedicated crossings for people walking and biking, and eliminate perceived and actual delay associated with navigating the off-set intersections. However, realigning this intersection would potentially increase vehicle volumes along Blanton Street, which would be counterproductive to reducing traffic stress for people and walking and biking. In addition, this alternative is costly, requires ROW acquisition from Intel, and was not incorporated into the SW 198th Avenue reconstruction and is therefore not recommended.



Exhibit 3: SW Blanton Street Realignment Concept Plan (Alternative C)

TV Regional Trail Concept Plan

April 16, 2021

Project #: 23021.002

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Blanton Intersection 3: SW 185th Avenue/SW Blanton Street

SW 185th Avenue/SW Blanton Street is an off-set stop-controlled intersection with no crosswalks. The eastbound leg is approximately 240-feet north of the westbound leg. Three alternatives were considered for this intersection. Attachment A (page B-8) presents a plan view of the intersection design for Alternative A without turn lanes. Turn lanes would require additional ROW or narrowing the combined space for bikes and pedestrians as shown in Figures 5-7.

Alternative A (Maintain Off-set Intersections, Construct Half-Signal)

Alternative A is to maintain the existing off-set intersections and provide a protected crossing for trail users via a half-signal at the southern intersection. High visibility crosswalks would be provided sides both of the on intersection for people biking either direction. This alternative is shown in the concept design in Attachment A. The off-set intersections would be connected for people walking and biking via a shared-use path on the west side of SW 185th Avenue. Part



Offset Intersections at SW Blanton Street/SW 185th Avenue - Looking West

of the recommendation for the half-signal at the southern intersection instead of the northern intersection is to avoid conflicts with the railroad north of the intersections.

People walking and biking heading eastbound would turn right onto the shared-use path and cross at the half-signal. People heading westbound would cross SW 185th Avenue at the half-signal, head north on the shared-use path, cross Blanton Street if bicycling, and then head west on the separated bike lanes.

Alternative B (Additional Turn Restrictions)

Alternative B proposes maintaining the recommendations outlined in Alternative A, but also making the northern leg of Blanton Street exit-only (at the half signal). Eastbound vehicles could turn right or left from Blanton Street, but only people walking and biking would be permitted to enter. This would reduce turning conflicts with bikes and pedestrians at the half signal. In addition, a bulb-out would be added at Blanton Street to enhance safety and comfort for people walking and biking. This type of treatment at multiple locations throughout the corridor would reduce the volume of vehicles using SW Blanton Street and could

create opportunities for a low-stress bike facility to be located on the street below the curb instead of separated behind the curb. This would reduce costs and reduce driveway conflicts.

Alternatives C, D, and E

Alternatives C, D, and E, shown in Exhibit 4, include realigning and signalizing the intersection of SW Blanton Street and 185th Avenue. Alternative C would require ROW acquisition from properties west of SW 185th Avenue. Alternative D would require relocation of the post office and ROW acquisition from additional properties east of SW 185th Avenue. Alternative E would require ROW acquisition from both sides of SW 185th Avenue and connect Blanton Street midway between the current off-set intersections. These concepts show the full 74-foot TSP ROW footprint, which would accommodate left-turn lanes.

These alternatives would provide a direct connection for the regional trail, dedicated crossings for people walking and biking, and eliminate perceived and actual delay associated with navigating the off-set intersection. Realigning and signalizing this intersection would also potentially increase vehicle volumes along SW Blanton Street, which would be counterproductive to reducing traffic stress for people and walking and biking. In addition, this alternative is costly and requires significant ROW acquisition; therefore, it is not recommended.

Exhibit 4: SW Blanton Avenue/SW 185th Realignment Alternatives







Note: Intersection footprint would be wider to accommodate left-turn lanes. See 74' ROW line in Alternative E shown in orange.

Cost Estimate

A planning level cost estimate was prepared for the SW Blanton Street regional trail concept design. The cost estimate includes enhanced driveways and local street crossing treatments, stormwater management, lighting, three new half signals, modifications to two existing traffic signals, and right-of-way. Costs of stormwater management includes permanent landscaping and right-of-way. The right-of-way estimate assumes that a few feet of right-of-way is needed from approximately 180 properties but that the design will avoid impacts to buildings. The cost estimate also includes engineering and contingencies.

Construction + 30% Contingency \$25,500,000

Engineering (30%) \$8,000,000

Right-of-way \$2,900,000

Total \$37,500,000 (\$15,300,000 per mile)

The breakdown of costs is included in Attachment B.

The full 74-foot cross-section would require approximately an additional 150,000 square feet of right-of-way, which would cost approximately an additional \$2.25 million not including properties that may require full purchasing. The 74' cross-section, if applied throughout the corridor, could result in the need to purchase approximately 30 properties due to the reduced setback and resulting lack of off-street parking. The additional construction cost of the additional 14-feet of pavement and base is estimated to cost an additional \$3-5 million. The estimated total additional cost compared to the 60' cross-section is \$5-7 million, not including potential full purchase of 30 homes.

A 55-foot cross-section would essentially eliminate the ROW costs of approximately \$3 million. In addition, there could be potential construction cost savings.

NEXT STEPS

The *Traffic Analysis Memorandum* and *Preferred Alignment and Concept Design Memorandum* will be shared the advisory committees. The recommendations will be shared with the public via an online open house. Based on the advisory committee and public input, the draft concept design will be refined and advanced into the Draft TV Trail Refinement Plan.

Key input that is needed to advance the Draft TV Trail Refinement Plan include the following:

On-Street Parking

- Should parking be limited and provided only where ROW is available, dedicated or low impact?
- Should the typical section include parking on one side (+/- 65') throughout the corridor or east of 185th and shift the centerline?

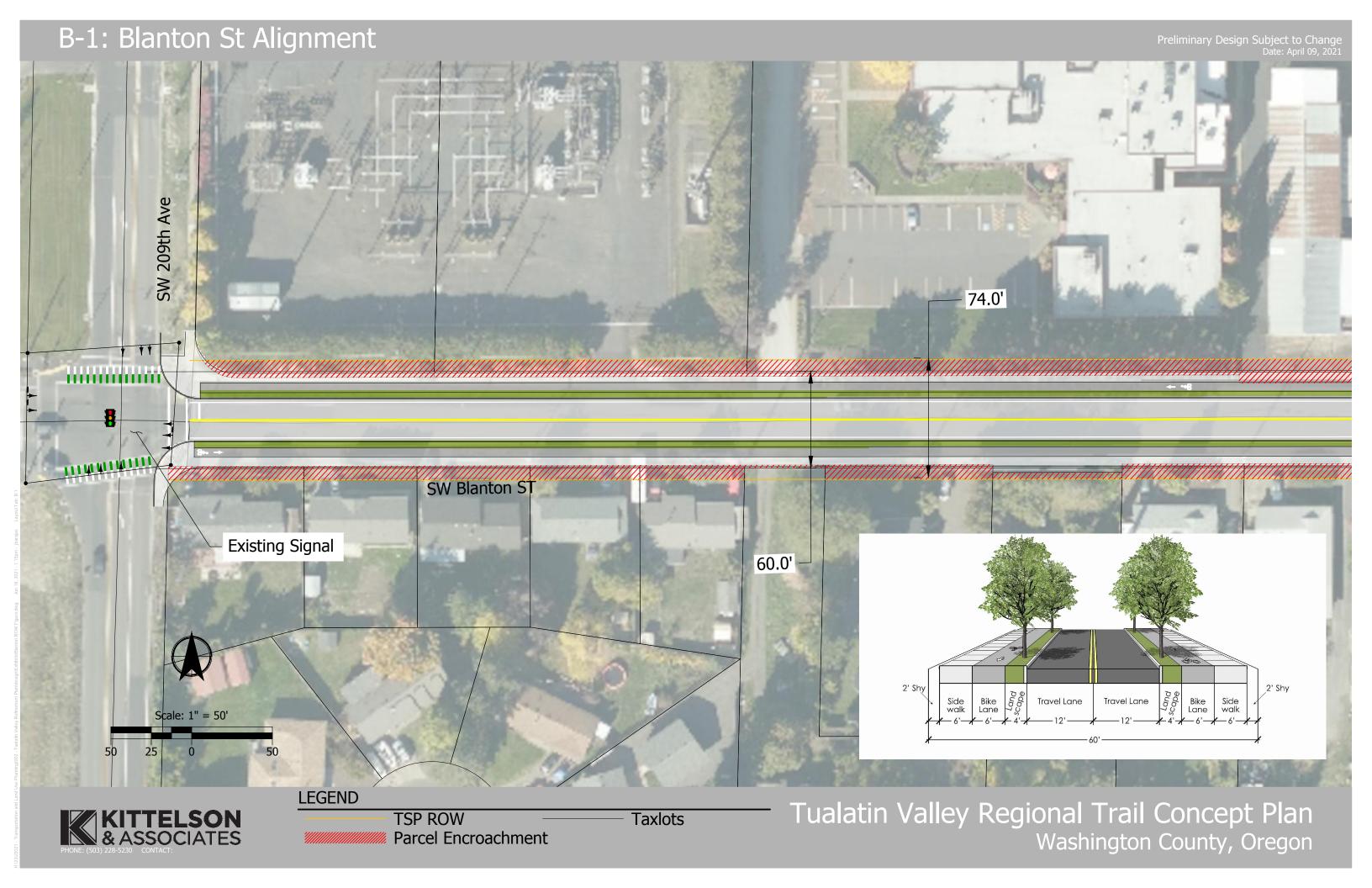
Left-turn Lanes at Major Intersections

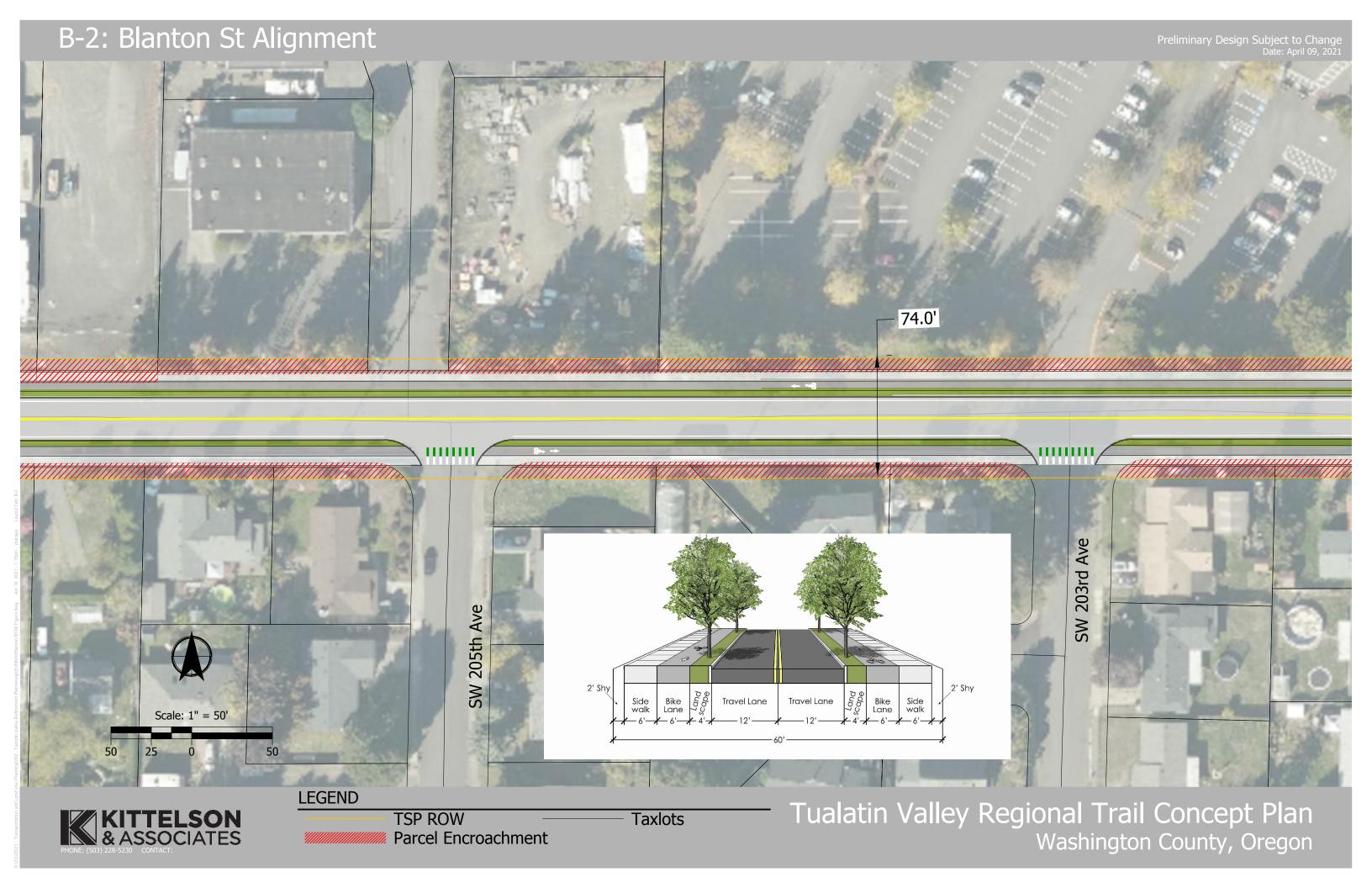
- Should left-turn lanes be provided at all major intersections, only specific intersections, or at no additional locations than present under existing conditions?
- Should reducing the roadway classification and diverting traffic be considered to minimize need for left-turn lanes?

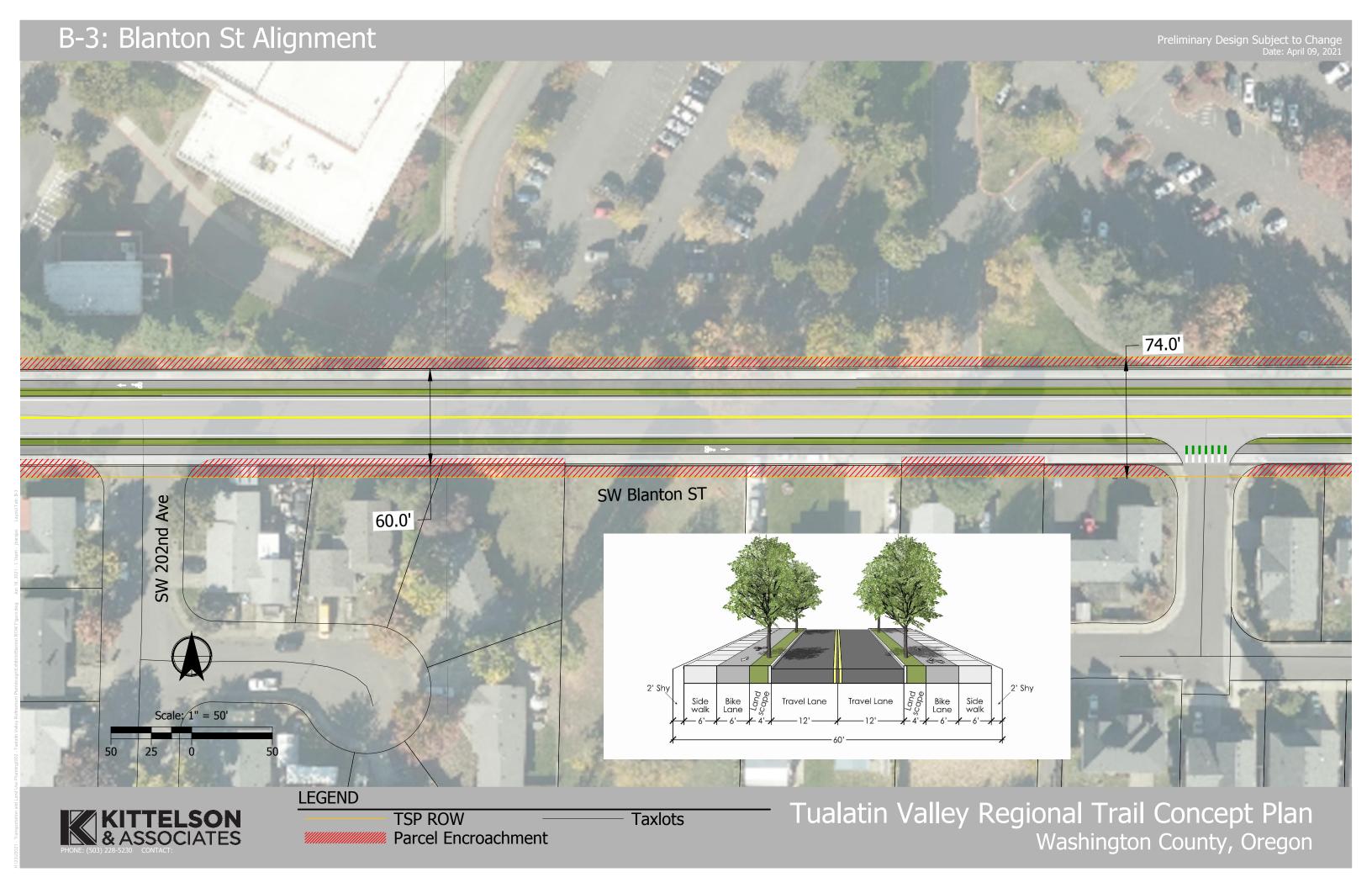
Separated Bike Lane

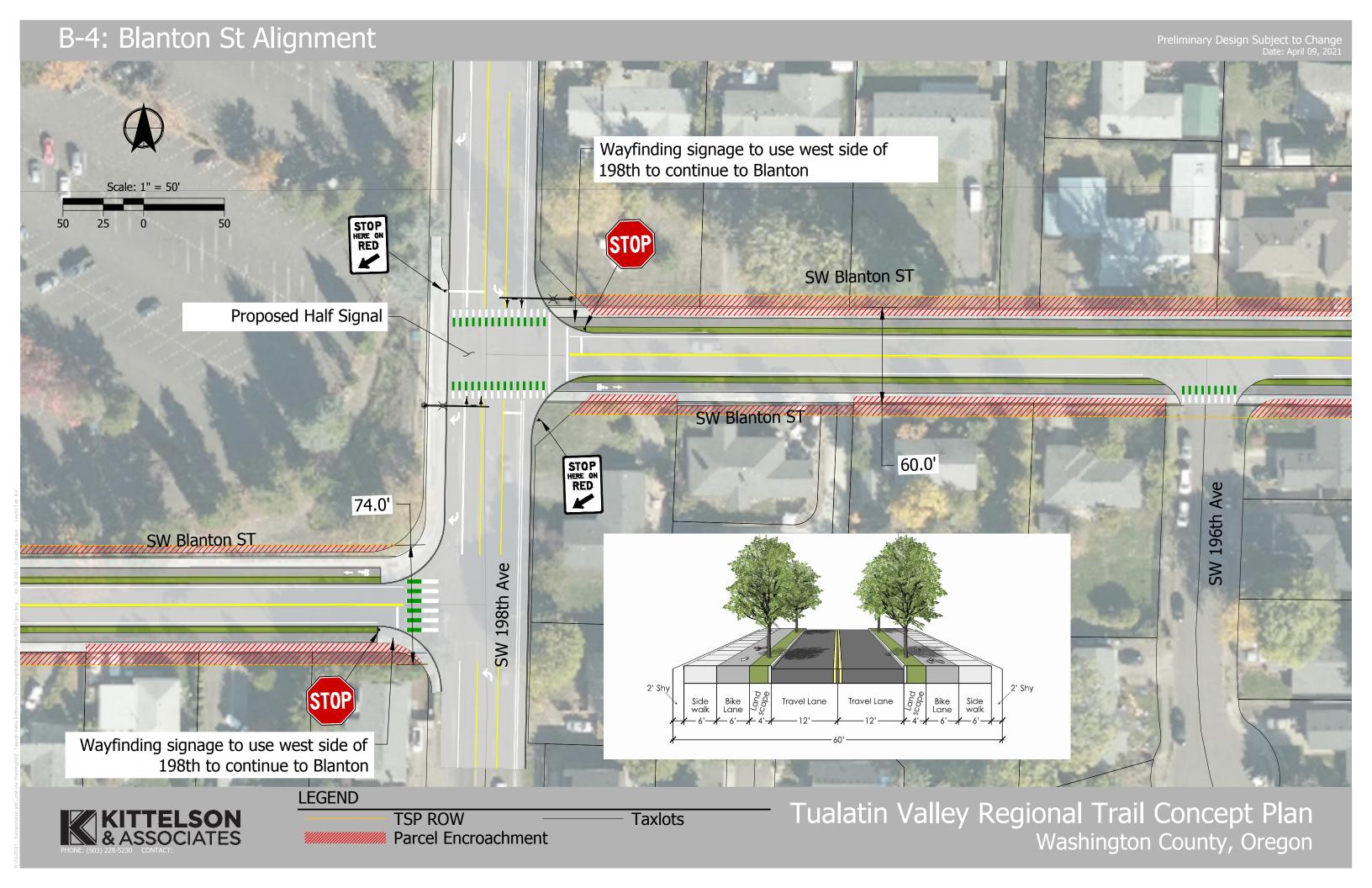
 Should the concept advance with the bike lane separated behind parking and/or above the curb or move towards traditional or buffered bike lane and seek to lower the stress by lowering traffic volumes?

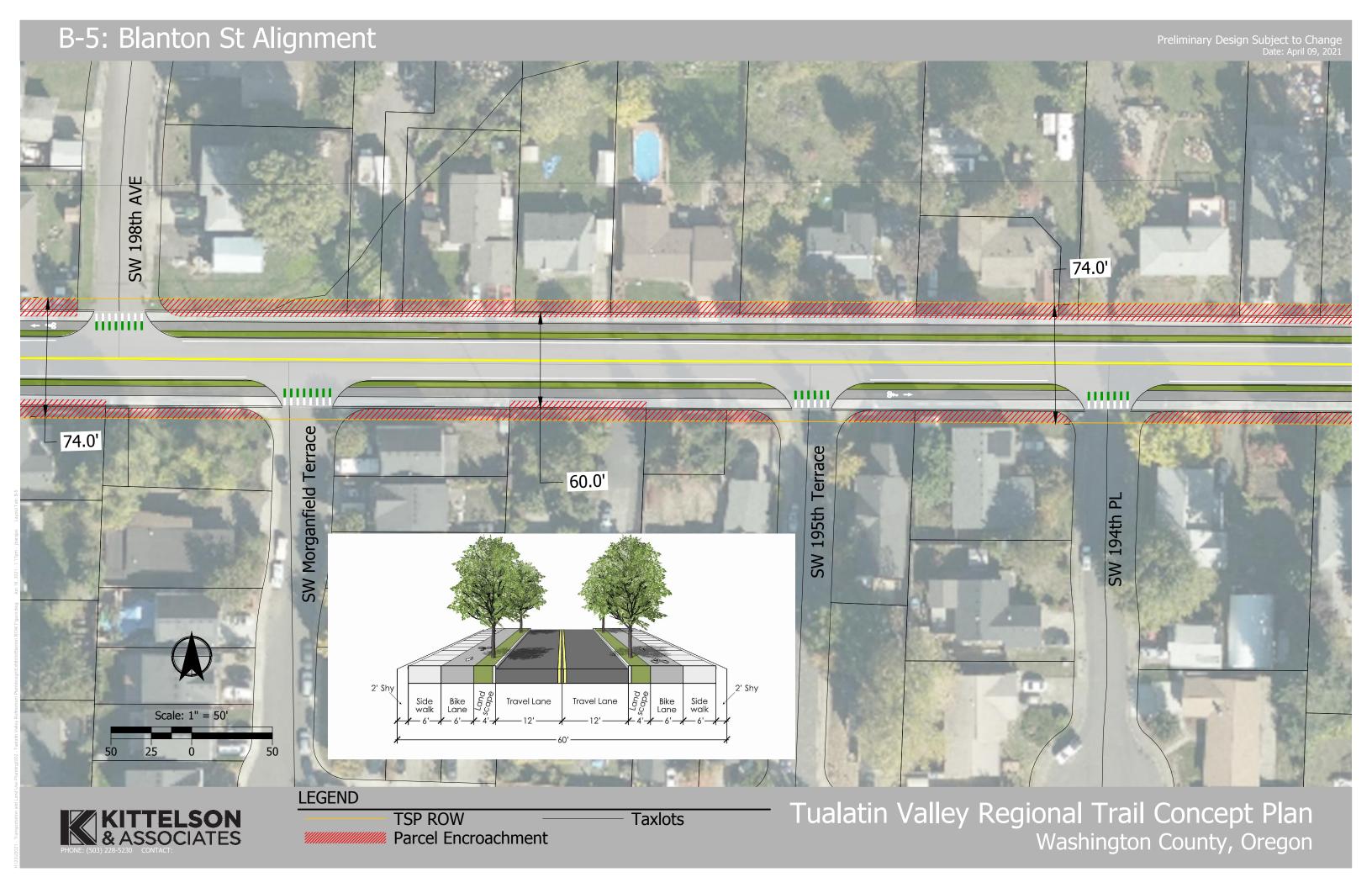
Attachment A Blanton Street Concept Design

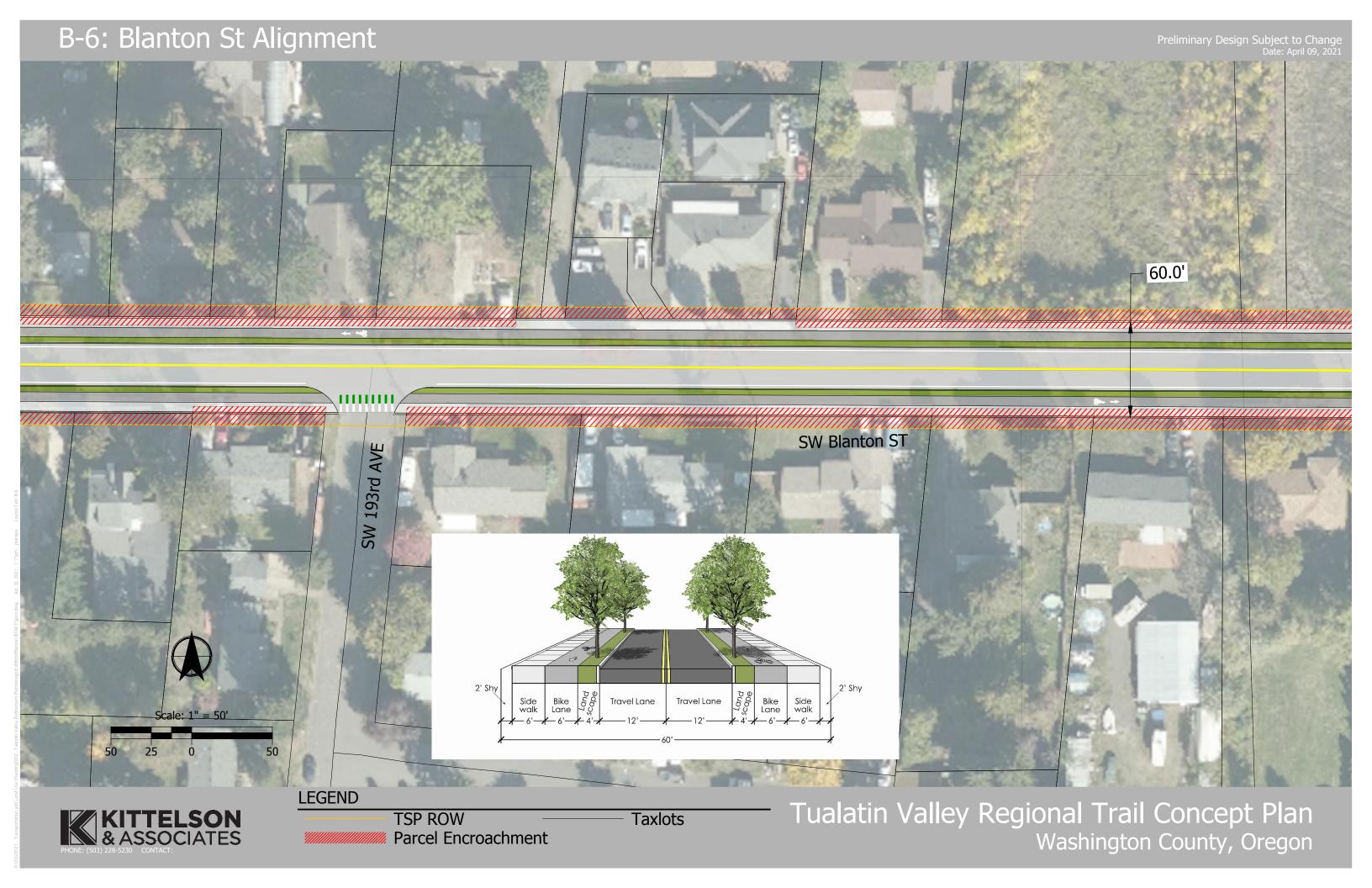


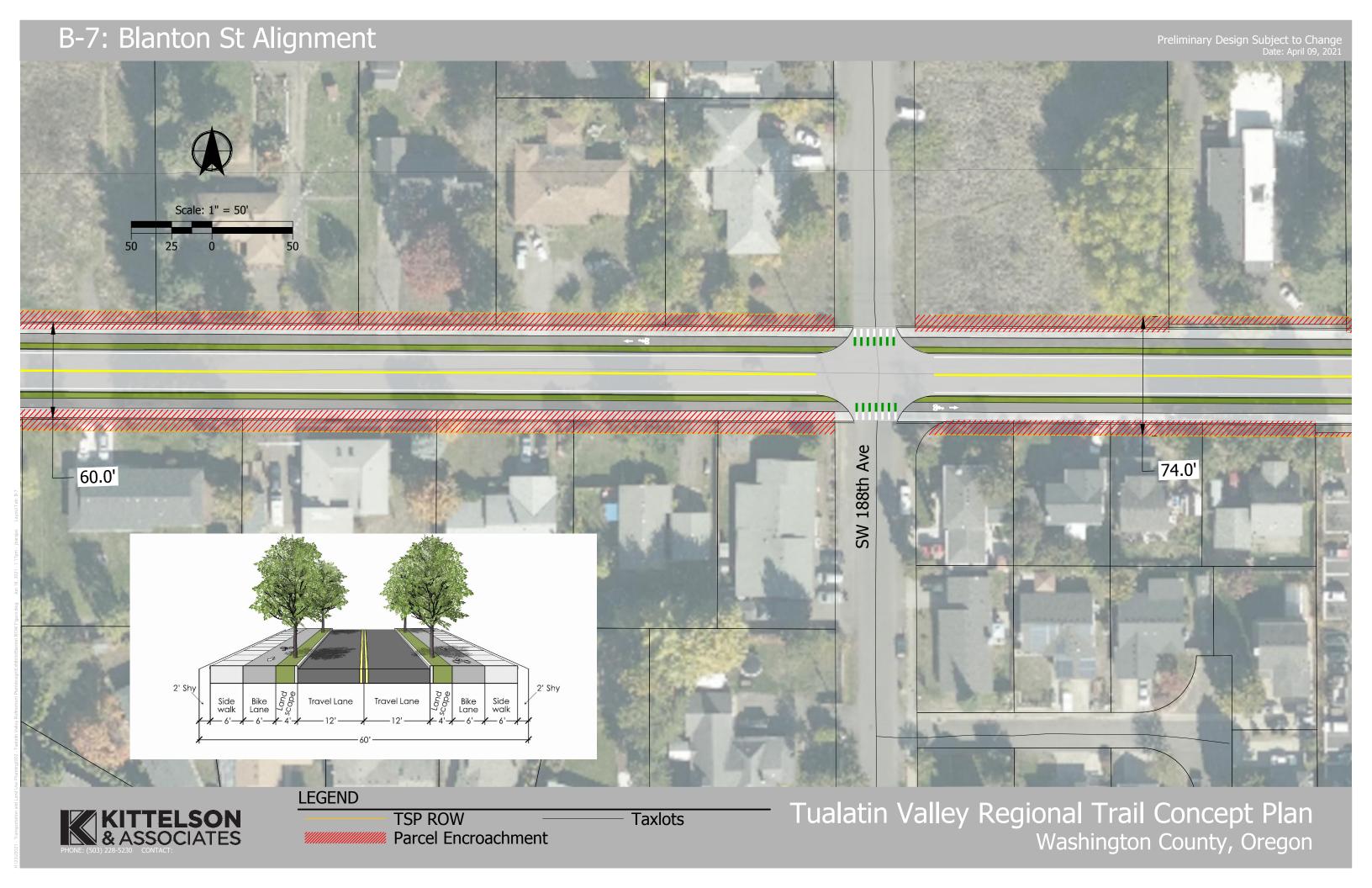


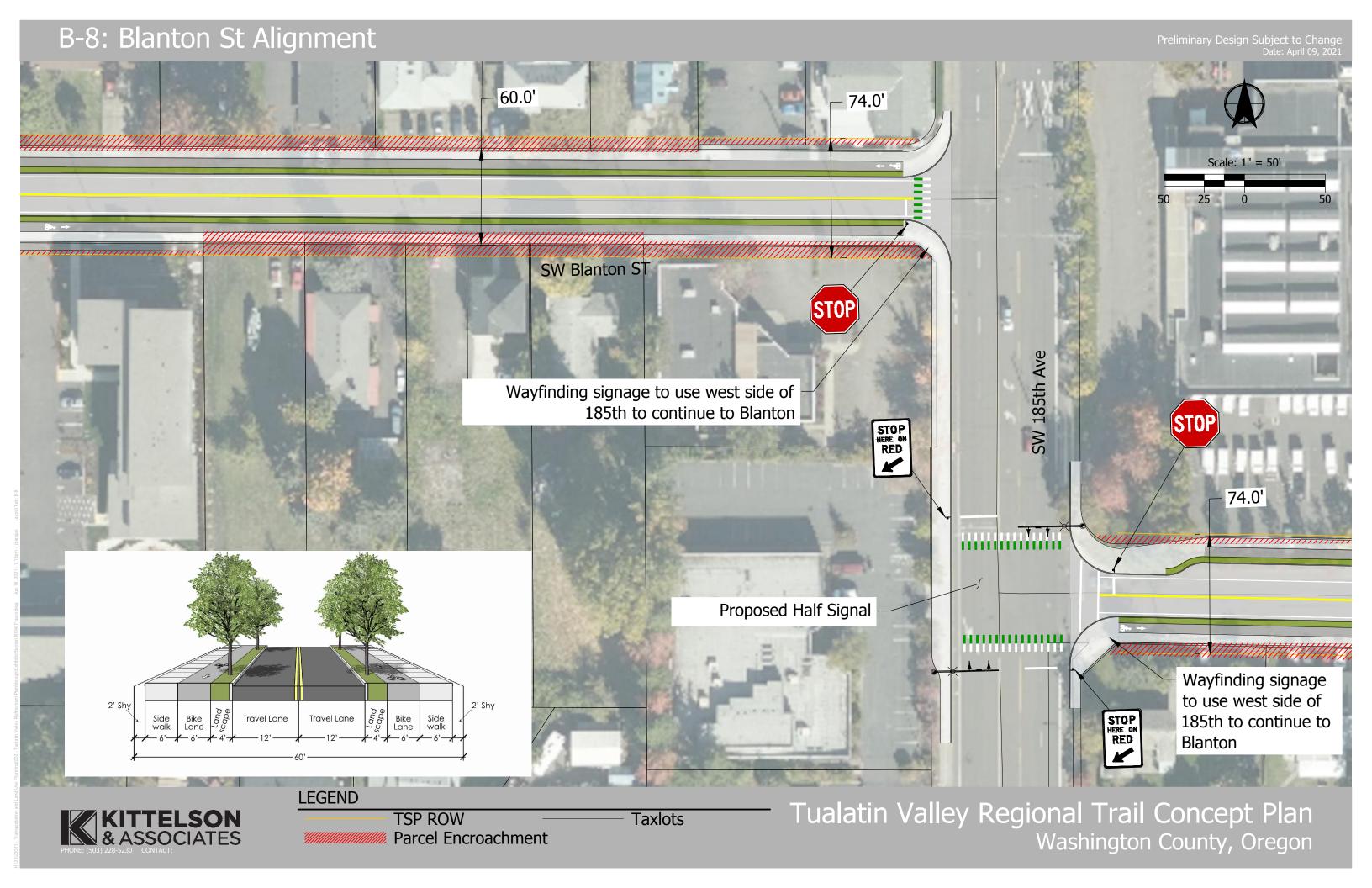


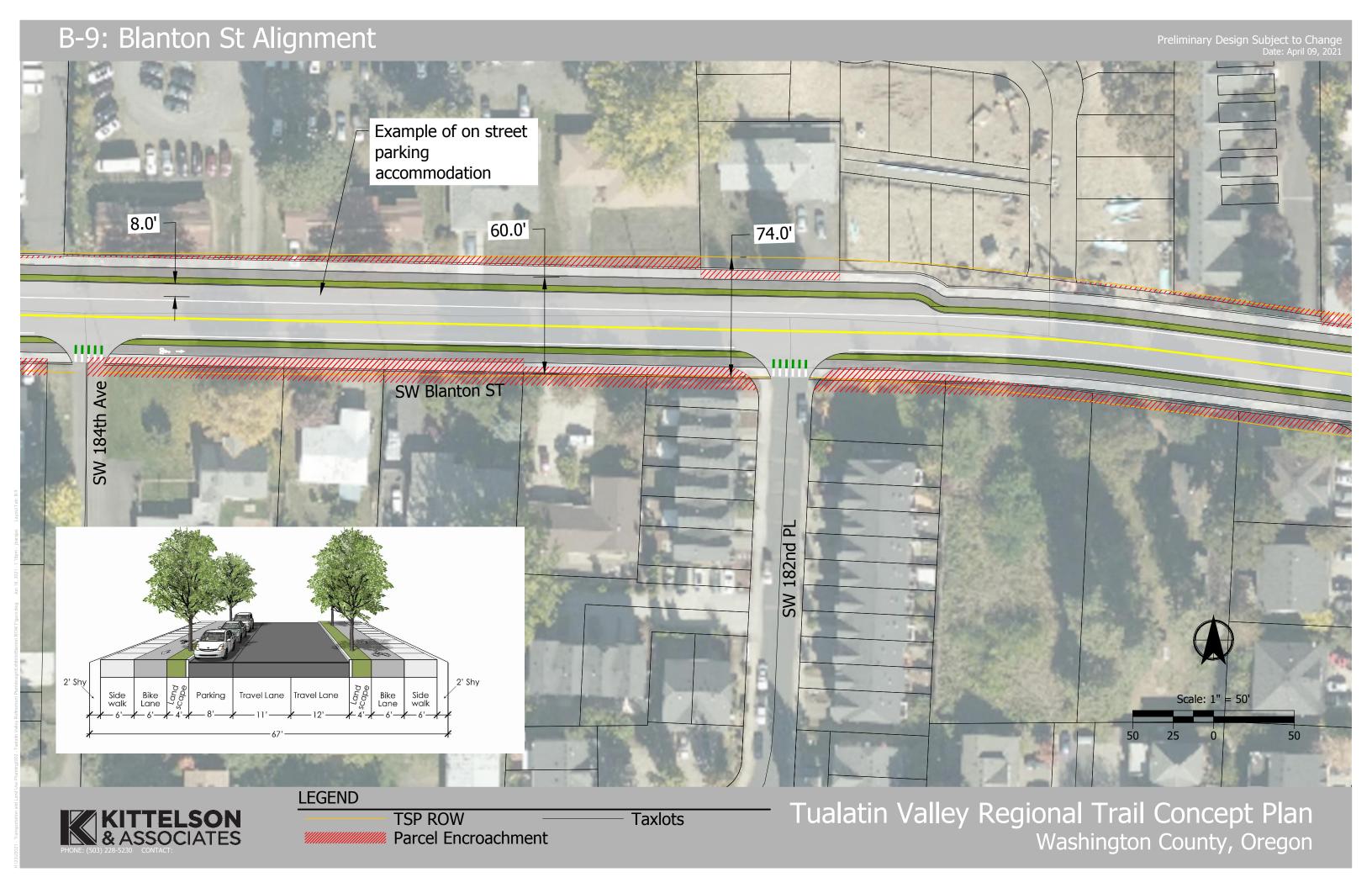


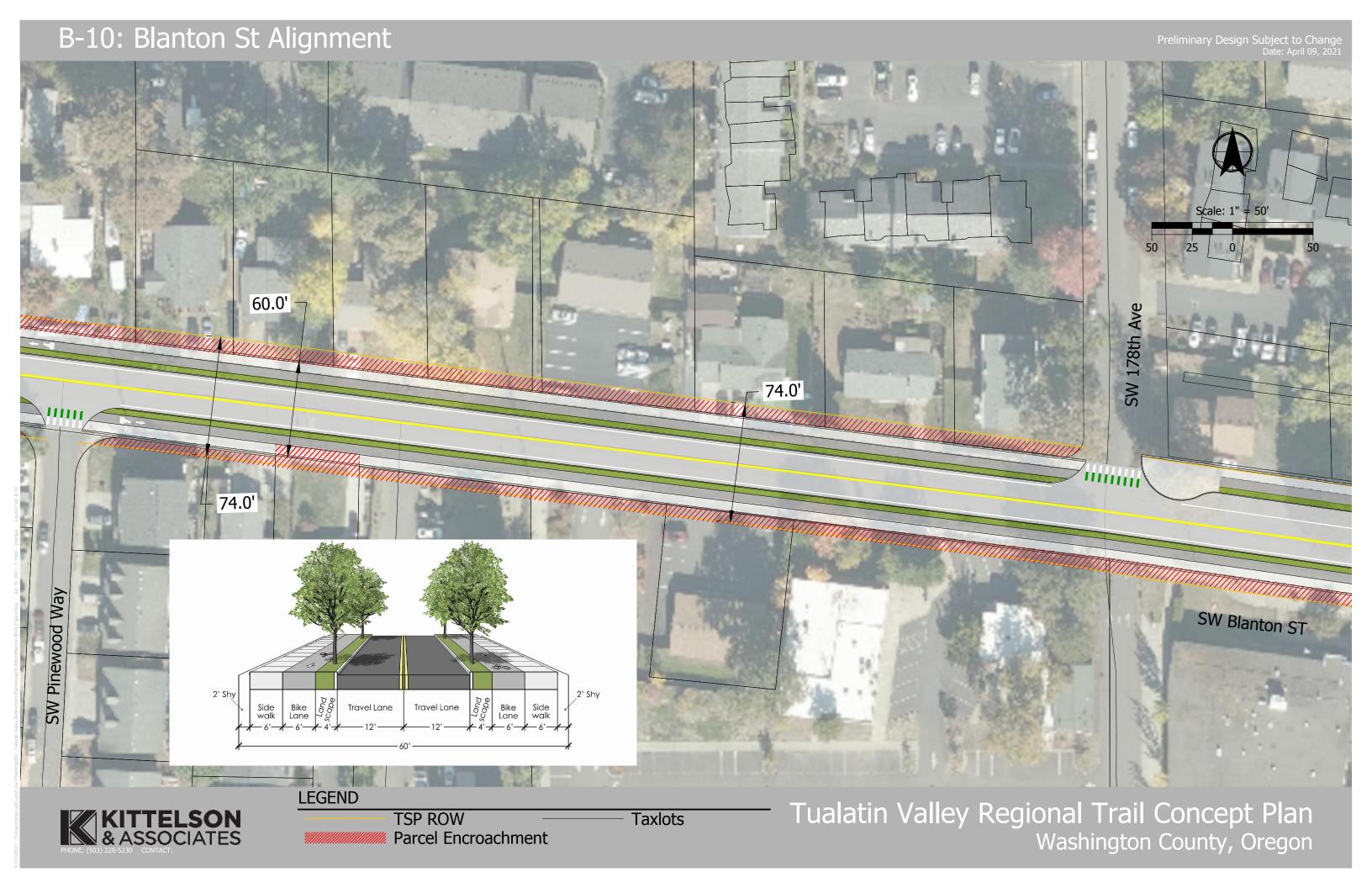


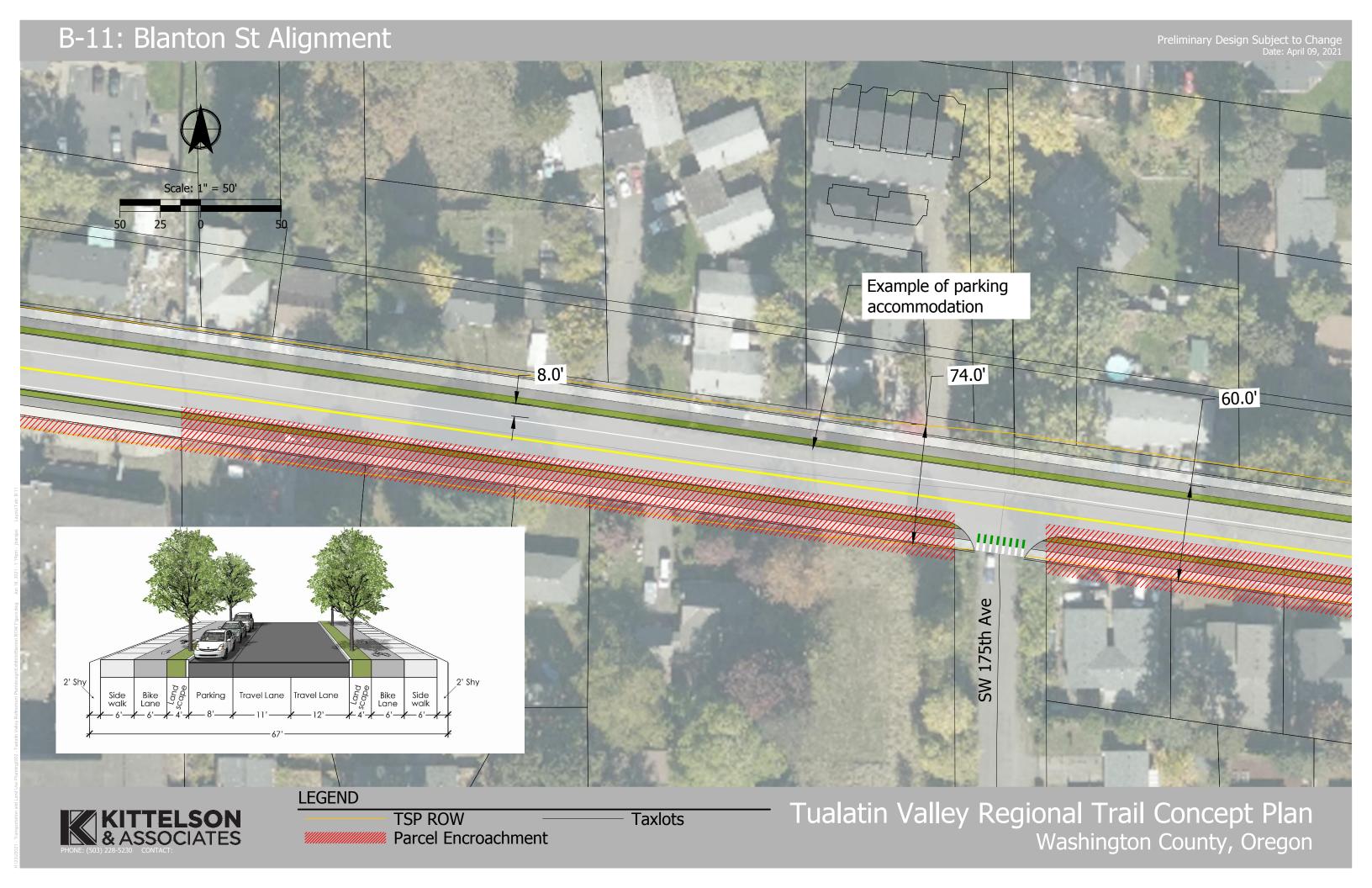


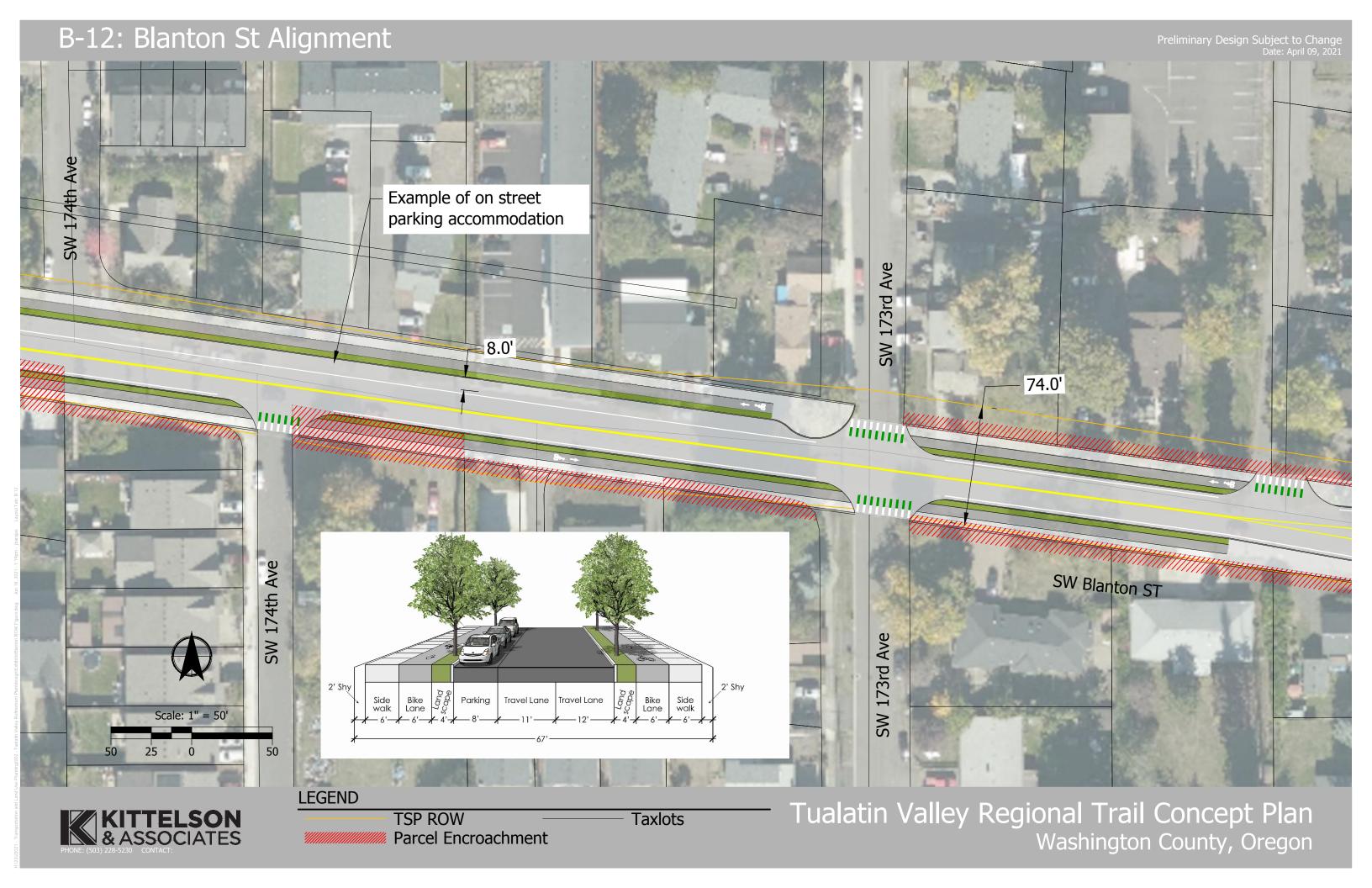


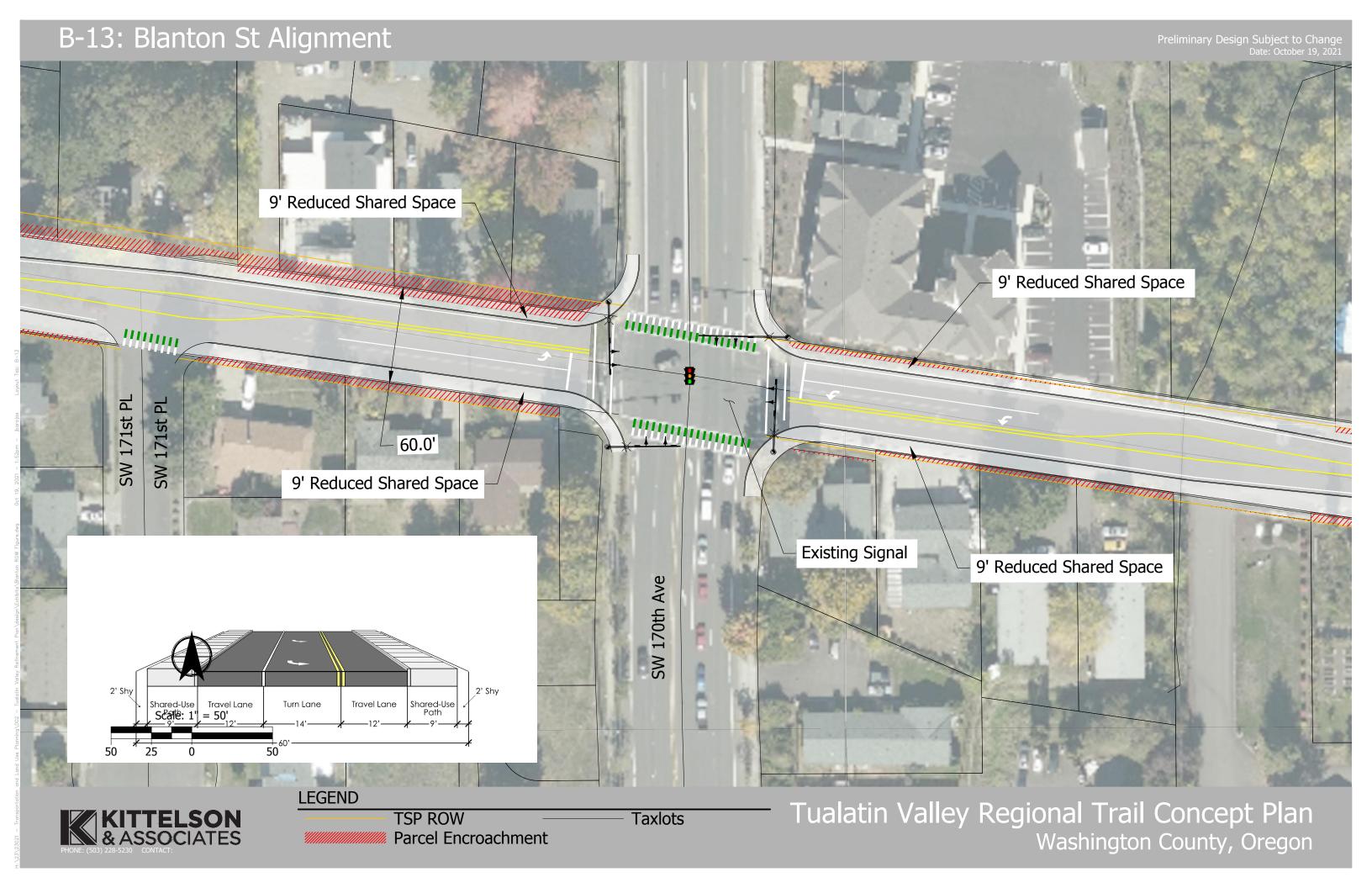


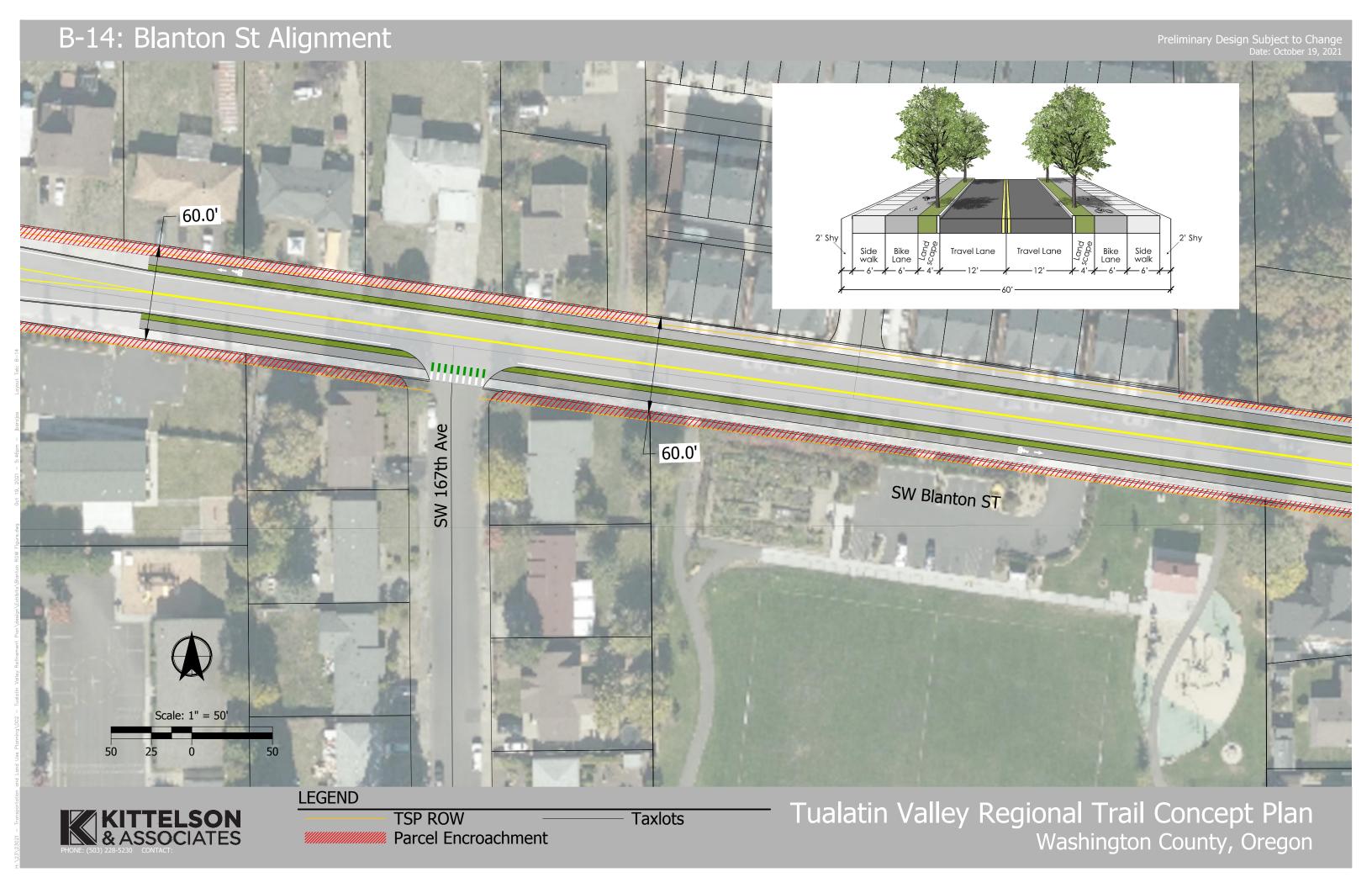


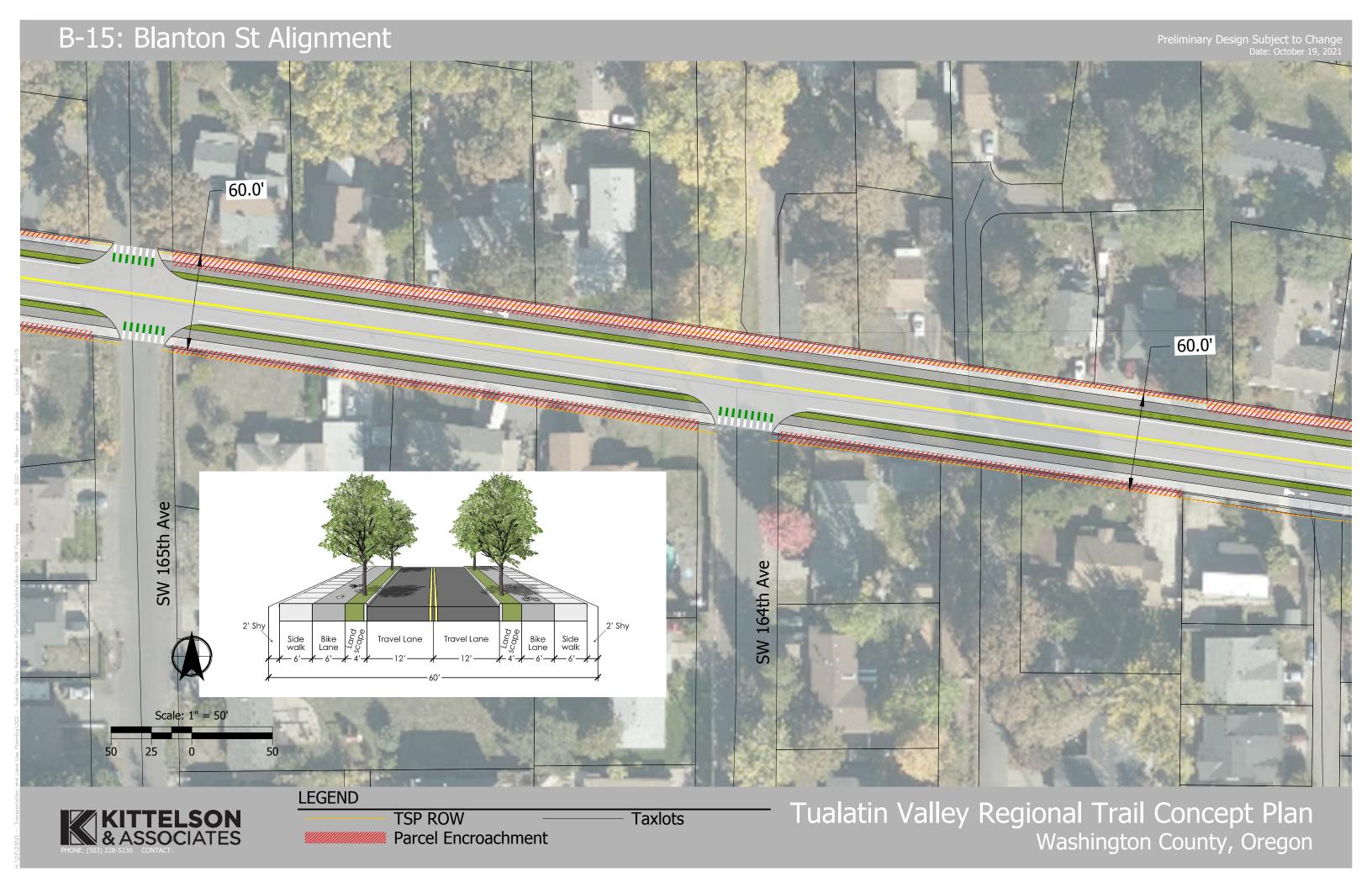


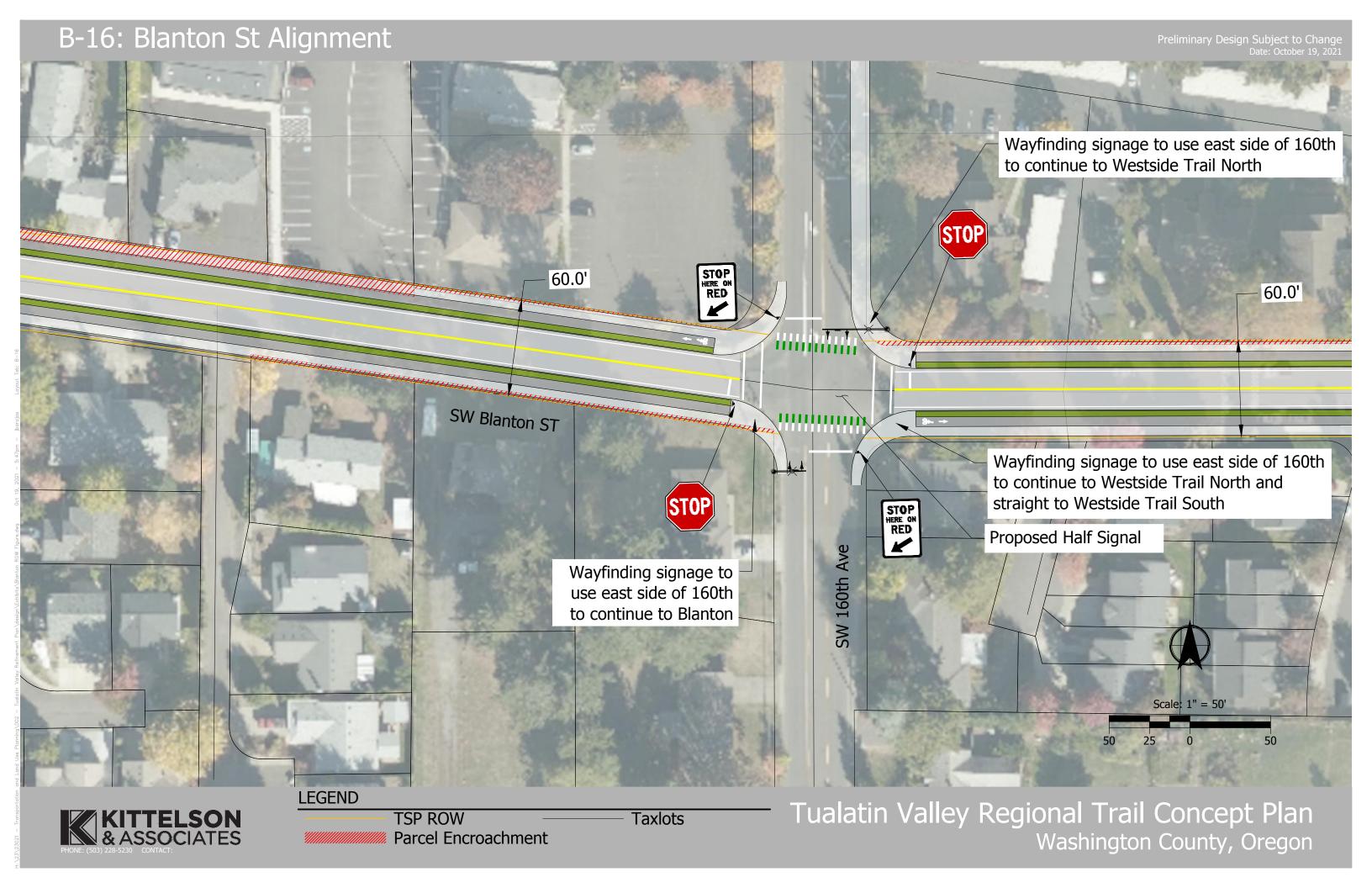


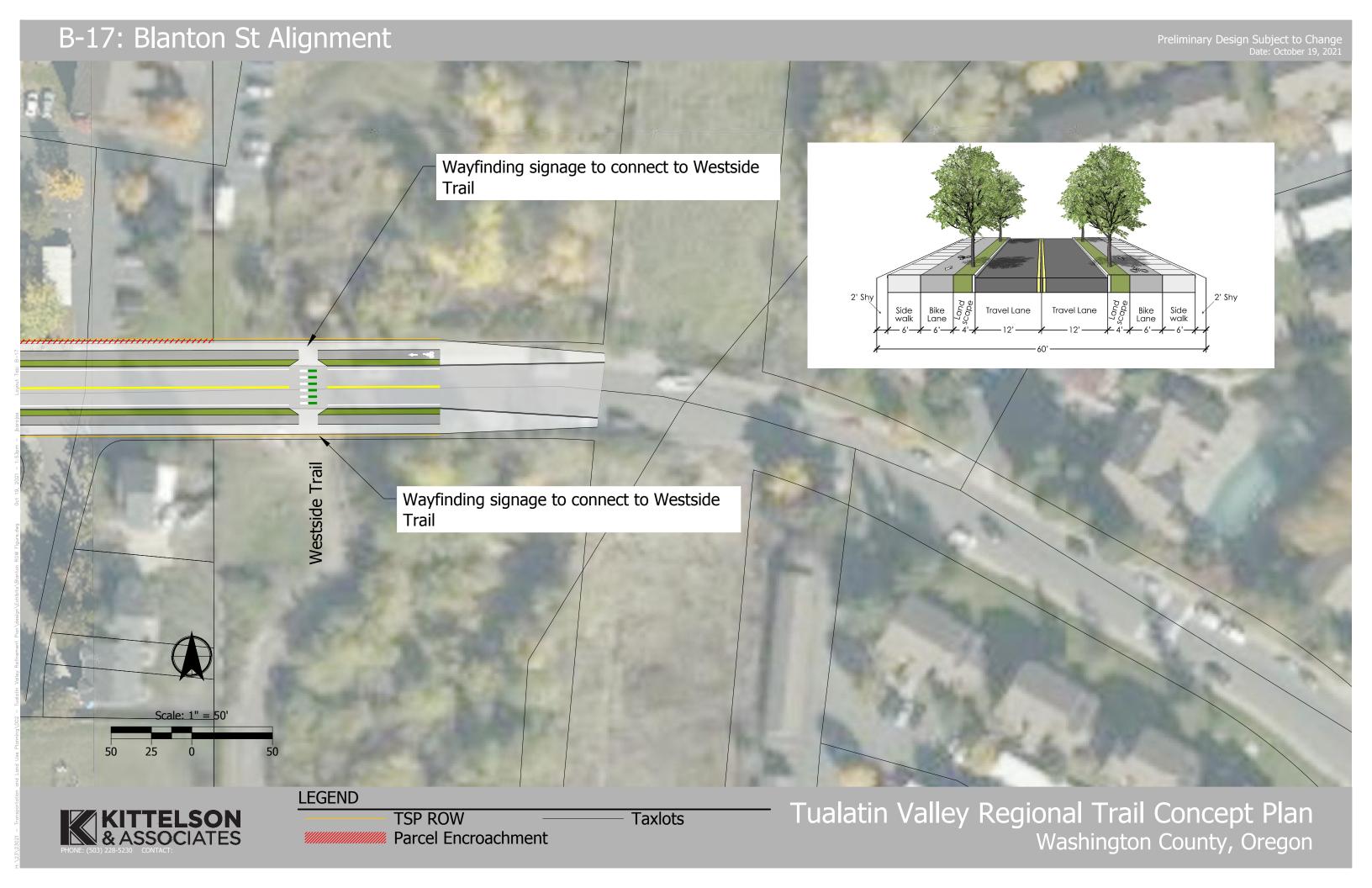


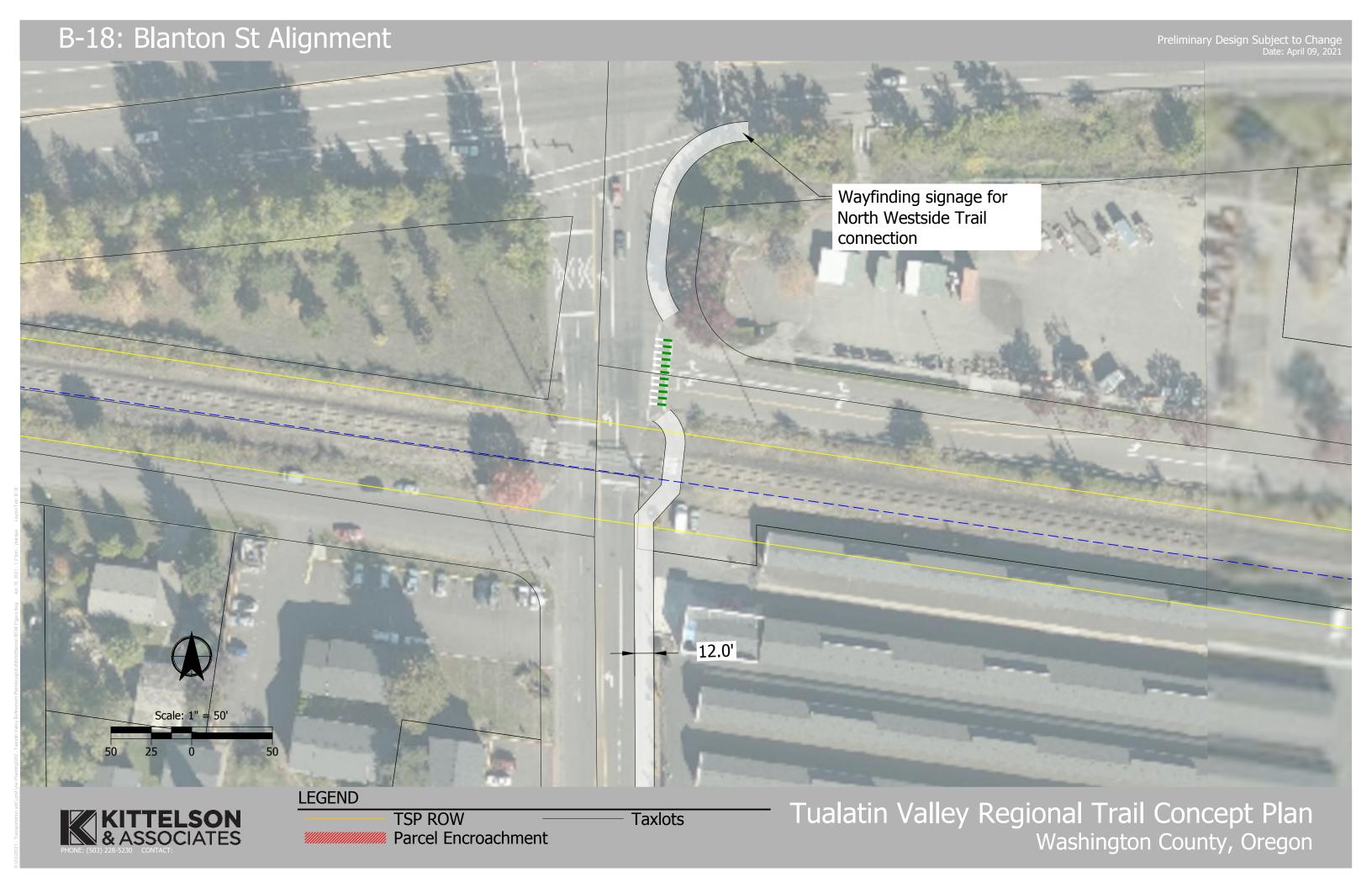






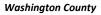






Attachment B Blanton Street
Cost Estimate

Tualatin Valley Regional Trail Concept Plan Blanton St Alignment (SW 209th Ave to SW 160th Ave)





Engineer's	s Conceptual	Estimate
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Mobilization LS Traffic Control LS Erosion Control LS Removal of Structures and Obstructions LS Clearing and Grubbing LS General Earthworks CY Asphalt TON Subgrade Geotextile SY Concrete Curbs - Standard Curb & Gutter LF Raised Bicycle Lane SF Concrete Walks SF Aggregate CY Detectable Warnings EA Extra for Driveways EA Extra for Driveways EA Extra for Sike/Pedestrian Ramps EA Extra for Sike/Pedestrian Ramps EA Extra for Sike/Street Connections EA Extra for Signal Modifications, Complete LS Signage, Complete LS SW 170th Ave Traffic Signal Modifications, Complete LS SW 198th Ave Traffic Half Signal, Complete LS SW 185th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete	ALL ALL ALL ALL ALL ALL ALL ALL ALL 41,500	(See rating scale gu UNIT PRICE \$1,747,000.00 \$1,058,000.00 \$156,000.00	*1,747,000.00
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Raised Bicycle Lane Concrete Walks SF Aggregate CY Detectable Warnings EA Extra for Driveways EA Extra for Bike/Pedestrian Ramps EA Extra for Side Street Connections Storm Water System & Water Quality Treatment, Complete Permanent Landscaping SF Pavement Markings, Complete LS Signage, Complete LS SW 170th Ave Traffic Signal Modifications, Complete LS SW 198th Ave Traffic Half Signal, Complete LS SW 185th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete	2,123	\$1.00	\$2,123.00
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Extra for Side Street Connections Storm Water System & Water Quality Treatment, Complete LS Permanent Landscaping Pavement Markings, Complete LS Signage, Complete LS Illumination System, Complete LS SW 170th Ave Traffic Signal Modifications, Complete LS SW 209th Ave Traffic Signal Modifications, Complete LS SW 198th Ave Traffic Half Signal, Complete LS SW 185th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete LS	185	\$8,000.00	\$1,480,000.00
Storm Water System & Water Quality Treatment, Complete Permanent Landscaping Pavement Markings, Complete LS Signage, Complete LS Illumination System, Complete SW 170th Ave Traffic Signal Modifications, Complete LS SW 209th Ave Traffic Signal Modifications, Complete LS SW 198th Ave Traffic Half Signal, Complete LS SW 185th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete LS	178	\$3,000.00	\$534,000.00
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Illumination System, Complete SW 170th Ave Traffic Signal Modifications, Complete LS SW 209th Ave Traffic Signal Modifications, Complete LS SW 198th Ave Traffic Half Signal, Complete LS SW 185th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete LS	ALL	\$195,000.00	\$195,000.00
SW 170th Ave Traffic Signal Modifications, Complete SW 209th Ave Traffic Signal Modifications, Complete LS SW 198th Ave Traffic Half Signal, Complete LS SW 185th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete LS	ALL	\$147,000.00	\$147,000.00
SW 209th Ave Traffic Signal Modifications, Complete SW 198th Ave Traffic Half Signal, Complete SW 185th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete LS	ALL	\$1,363,100.00	\$1,363,100.0
SW 198th Ave Traffic Half Signal, Complete SW 185th Ave Traffic Half Signal, Complete LS SW 160th Ave Traffic Half Signal, Complete LS	ALL	\$50,000.00	\$50,000.0
SW 185th Ave Traffic Half Signal, Complete SW 160th Ave Traffic Half Signal, Complete LS LS	ALL	\$50,000.00	\$50,000.0
SW 160th Ave Traffic Half Signal, Complete LS	ALL	\$150,000.00	\$150,000.0
	ALL	\$150,000.00	\$150,000.00
CONSTRU	ALL	\$150,000.00	\$150,000.00
CONSTRU			
CONSTRU	30	% Contingency	\$ 6,128,460
	JCTION COS	ST SUBTOTAL	\$ 26,556,645
	3(0% Engineering	\$ 7,967,000
Right of Way Impact Area SF	74,915	\$15.00	\$1,123,725.0
Right of Way Parcels Impacted EA	178	\$10,000.00	\$1,780,000.0
TOTAL EST	TIMATED PI	ROJECT COST	\$ 37,427,370
ESTIMATED P		OST PER MILE	\$ 15,339,086
ESTIMATED PROJECT C	PROJECT CO		\$ 14,149,035

Assumptions:

- ROW avoids building impacts

Scope Accuracy:

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Level C: No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

Attachment C Shaw Street Concept Overview

SW SHAW STREET – PREFERRED CONCEPT DESIGN

The concept design for SW Shaw Street has been developed from SW 198th Avenue to the SW 160th Ave/SW Shaw Street intersection.

The segment between SW 209th Avenue and SW 160th is proposed as a 50-foot cross section, as illustrated in Figure C1 This cross section features a buffered 12-foot multi-use trail on the north side and a buffered 6-foot sidewalk on the south side of the 22-foot road.

1' Shy
Side walk
6' 4' 22' 4' 12'

50'

Figure C1: SW Shaw Street – 50-foot Concept Cross Section (facing west)

Cross Section

The 50-foot cross section with a 12-foot buffered trail facility on the north side was chosen to minimize conflicts with vehicles, as there are no driveways on the north side of Shaw Street. While the cross-section fits within the Washington County TSP's identified 50' ROW for SW Shaw Street, the concept design encroaches on some tax parcels on the south side of SW Shaw Street in order to remain outside the railroad's required 30-foot offset area.

Concept Design Considerations

A number of factors were considered during the development of the concept plan for SW Shaw Street including right-of-way (ROW) encroachment, conflict points, priority destinations, on-street parking, safety and security, and intersection treatments. Figure C2 summarizes these key segment considerations,

and the following sections detail the findings. Figure C3 presents a summary of the recommended treatments for these intersections. Attachment D provides the concept design layout.

Right-of-Way

A right-of-way (ROW) of 60-foot is planned in the Washington County Transportation System Plan (TSP), while existing ROW is approximately 50-foot. The 50-foot cross section is recommended primarily to minimize ROW needs for the project and to allow space for on-street parking if desired where the TSP ROW could be obtained as part of this project in areas with minimum impact.

The cross section does encroach in some areas on tax lots on the south side of SW Shaw Street in order to remain outside of the railroad's 30-foot offset area.

Priority Destinations

Priority destinations include the Westside Trail east of SW Blanton Street/SW 160th Avenue; transit stops along TV Highway; and housing and businesses along the corridor. The SW Shaw Street alignment offers close access to both transit and businesses along TV Highway, but does not offer a direct connection to the City of Hillsboro separated bike lanes or the Westside Trail to the south.

On-Street Parking

Under existing conditions, informal parking occurs along the corridor, mostly within the railroad's 30-foot offset area. While parking is not included in the typical 50-foot cross section, where 60-feet of ROW can be acquired (as per the Washington County TSP), there is an opportunity to include on-street parking on the south side of the street.

Conflict Points

There are a number of driveways on the south side of SW Shaw Street, mainly to industrial businesses. However, there are no driveways on the north side of SW Shaw Street, where the trail facility is proposed resulting in minimal conflict points for people using the facility.

Railroad Crossings

SW Shaw Street runs parallel to the railroad. There are approved crossings of the railroad at SW 198th Avenue, SW 185th Avenue, SW 170th Avenue, and SW 160th Avenue. There are also many locations along the corridor where people cross the railroad without a crossing. Two primary locations that dirt paths indicate many people cross the railroad are at SW 178th Avenue and SW 192nd Avenue. These locations are roughly mid-way between approved crossings and correspond with transit stops and opportunities for crossing TV Highway. It is recommended that Washington County work with the railroad to provide railroad crossings for pedestrians at these locations.

Safety and Security

The SW Shaw Street facility is proposed as a 12-foot bi-directional, shared use path, with no demarcation between people walking and biking. However, a 6-foot sidewalk is proposed on the south side of the roadway for people walking that may desire a separated facility.

Lighting is a key element of a secure roadway and regional trail. The roadway should be adequately lit for safety and security at night.

Natural Resource Enhancements and Stormwater Management

Four-foot planter strips are included on each side of the road, providing an opportunity for stormwater management.

Intersections

There are four major intersections along the SW Shaw Street alignment that were evaluated to determine the recommended level of separation and type of enhanced crossing treatments based on national and local guidance. These intersections include:

- SW Shaw Street/SW 198th Avenue signalized intersection
- SW Shaw Street/SW 185th Avenue stop-controlled right-in/right-out movements only
- SW Shaw Street/170th Avenue stop-controlled right-in/right-out movements only
- SW Shaw Street/SW 160th Avenue stop-controlled, full access, off-set intersections

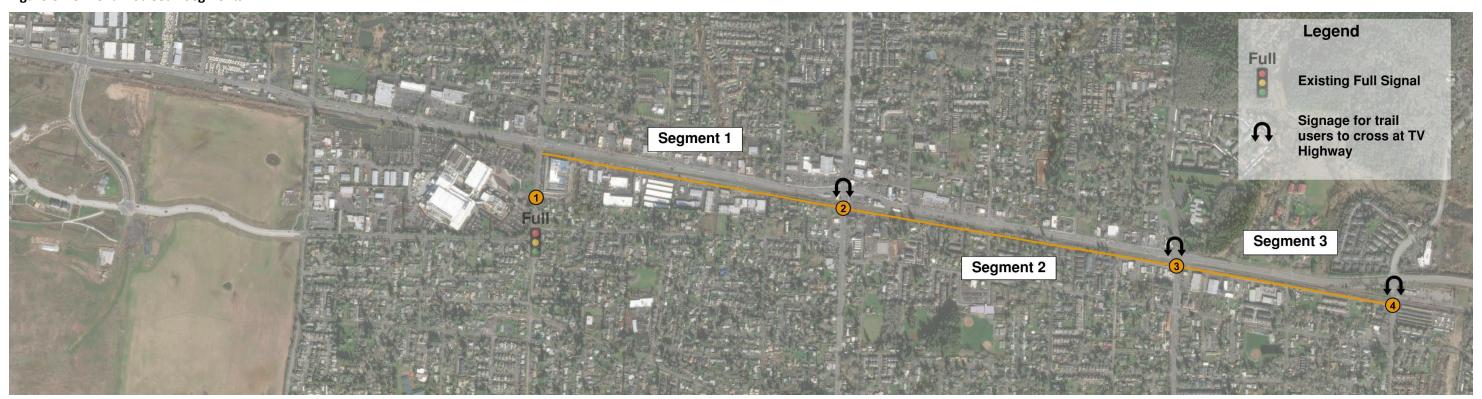
A key element of the regional trail is safe and convenient crossings at major streets. For SW Shaw Street to have safe and direct crossings, half signals would be required at the intersections of SW Shaw Street with SW 185th Avenue. At SW 170th Avenue, trail users would be directed to cross at TV Highway via wayfinding signage. At SW 160th Avenue, trail users would be directed to cross at TV Highway or at SW Blanton Street to continue on the Westside Trail to the north or south. This would not require any out of direction travel. To accommodate the half signal at SW 185th Avenue, an eastbound right-turn lane with adequate storage capacity would be required at TV Highway (that could be stop controlled when the half-signal was actuated for people to cross the north-south street), the railroad crossing would need to be reconstructed, and advanced signal controllers would be needed to coordinate the TV Highway signal with the half-signal and the railroad crossing. These would be unique designs and signal controls and would require extensive coordination with the railroad.

Due to the technical challenges and costs associated with constructing half signal at the SW 185th/SW Shaw Street intersection, a direct crossing may not be feasible. If the County is not able to obtain approval from ODOT and the railroad for the half signal, trail users would be required to cross at SW TV Highway which would add significant delay, out-of-direction travel, and discomfort associated with crossing the railroad tracks two times. Without a half signal, SW Shaw Street may not be appropriate as the regional trail route; however, the segment improvements included in the concept design still have value as a local

low stress facility for walking and biking that provides access to transit and destination on TV Highway. These improvements would provide an alternative to the eastbound bike lane on TV Highway from SW 198th Avenue to SW 160th Avenue despite the inconvenient crossings of the major side streets.

TV Regional Trail Concept Plan
April 16, 2021
Page 5

Figure C2: SW Shaw Street – Segments



	Segment 1 SW 198 th Avenue to SW 185 th Avenue (Figures S-1 through S-5)	Segment 2 SW 185 th Avenue to SW 170 th Avenue (Figures S-5 through S-10)	Segment 3 SW 170 th Avenue to SW 160 th Avenue (Figures S-10 through S-13)
Recommended Cross Section	50' cross section		
TSP Planned ROW:	60' ROW		
Approximate Existing ROW	50' ROW		
ROW Encroachment	Trail to be extended along north side of self-storage building on easement. There is no ROW encroachment on this segment.	There is some ROW encroachment on the south side of SW Shaw Street east of SW 178 th Avenue and between SW 174 th Avenue and SW 172 nd Avenue.	There is no ROW encroachment on this segment.
Conflict Point Treatments	Along this segment, there are no driveways on the north side, 48 driveways on the south side, and one three-legged intersection (SW 188th Avenue). Therefore, there are no conflict points with the trail.	Along this segment, there are no driveways on the north side, 23 driveways on the south side, and four three-legged intersection (SW 172 nd Avenue, SW 173 rd Avenue, SW 174 th Avenue, and SW 178 th Avenue). Therefore, there are no conflict points with the trail, but crosswalks are recommended on the northbound approach at all streets for the sidewalk.	Along this segment, there are no driveways on the north side, 18 driveways on the south side, and one three-legged intersection (SW 165 th Avenue). Therefore, there are no conflict points with the trail, but a crosswalk is recommended on the northbound approach at SW 165 th Avenue for the sidewalk.
Priority Connections	The primary destinations between SW 198 th Avenue and SW 185 th Avenue are industrial businesses. In addition, there are several TriMet bus stops on TV Highway, including one 150-feet east of the SW 198 th Avenue/TV Highway intersection (Route 57, eastbound), one 150-feet west of the SW 198 th Avenue/ TV Highway intersection (Route 57, westbound), and one 75-feet west of the SW 185 th Avenue/TV Highway intersection (Routes 52 and 57, eastbound).	The primary destinations between 185 th Avenue and SW 170 th Avenue are the US Post Office and a church, along with residences. There are also two TriMet bus stops at the intersection of TV Highway and SW 170 th Avenue, one on the south side of TV Highway 150-feet east of the intersection (Route 57, eastbound) and one on the north side of TV Highway 150-feet west of the intersection (Route 57, westbound).	The primary destinations between 170 th Avenue and SW 160 th Avenue are industrial businesses and residences. There are also two TriMet bus stops at the intersection of TV Highway and SW 160 th Avenue, one on the south side of TV Highway 175-feet east of the intersection (Route 57, eastbound) and one on the north side of TV Highway 90-feet east of the intersection (Route 57, westbound). There is also a need to connect to the Westside Trail east of SW 160 th Avenue/Blanton Street and its continuation north of TV Highway at SW Milikan Way.
On-Street Parking	There will be displaced on-street parking on the north side of SW Shaw Street that occurs in the railroad offset area.	There will be displaced on-street parking on the north side of Shaw Street that occurs in the railroad off-set area east of SW 185 th Avenue and west of SW 170 th Avenue.	There will be displaced on-street parking on the north side of SW Shaw Street, directly east of SW 170 th Avenue.

Fortland, Oregon

TV Regional Trail Concept Plan
April 16, 2021
Page C 6

Figure C3: SW Shaw Street – Intersections



	1. SW 198 th Avenue/ SW Shaw Street	2. SW 185 th Avenue/ SW Shaw Street	3. SW 170 th Avenue/ SW Shaw Street	4. SW 160 th Avenue/ SW Blanton Street
		(Figure S-5)	(Figure S-10)	(Figure S-13)
Existing Traffic Control/ Intersection Type	Signalized	Stop-controlled – right-in/right-out only	Stop-controlled- right-in/right-out only	Stop-controlled
Proposed Crossing Treatment	NA	Half Signal	Signage for trail users to cross on TV Highway	Signage for trail users to cross on TV Highway or Blanton Street
Considerations	NA	Constructing half-signal will require coordination with ODOT and the railroad	Constructing half-signal likely to be infeasible due to lack of storage space between Shaw and TV Highway	-
Alternatives	NA	Cross at TV Highway or construct Half-Signal at Shaw Street	Cross at TV Highway or construct Half-Signal at Shaw Street	Cross at TV Highway or construct Half-Signal at Shaw Street
Side Street Left Turn Lanes	No	NA	NA	No

Segment and Intersection Recommendations

The following sections provide additional details on the design considerations and alternatives for each segment and intersection shown in Figure C2 and Figure C3 and detailed in the Attachment D concept design.

Shaw Segment 1: SW 198th Avenue to SW 185th Avenue

A 50' ROW cross-section is proposed along the corridor from east of SW 198th Avenue to SW 185th Avenue. The segment will start/end with a shared-use path along the north side of the self-storage development at the southeast corner of the TV Highway/SW 198th Avenue intersection. This will provide people walking and biking on SW Shaw Street with a direct connection to the TV Highway/SW 198th Avenue intersection and access to transit stops located at the intersection. Attachment D (pages S-1 through S-5) presents a plan view of the concept design, including the railroad's 30' offset and available ROW. The proposed concept design is outside of the railroad's 30' offset and within the TSP's planned ROW; however, some ROW will need to be acquired.

As Shaw Street is not recommended as the regional trail, these improvements would serve primarily to give access to transit and destinations along TV Highway. A widened sidewalk could be implemented on the west side of SW Shaw Street from the start of the shared-use path to the signal at SW 198th Avenue/SW Shaw Street utilizing space from the landscape buffer. This would help connect people walking and biking on SW Shaw Street to potential regional trail facilities on SW Blanton Street via bike lanes and sidewalks on SW 198th Avenue.

Shaw Intersection 1: SW 198th Avenue/SW Shaw Street

SW 198th Avenue/SW Shaw Street is currently a signalized intersection with crosswalks on the east, west, and south legs.

For this intersection, signal phasing adjustments are recommended, including potential Leading Pedestrian Intervals (LPIs). In addition, the current crosswalks could be enhanced to high-visibility crosswalks.

Shaw Intersection 2: SW 185th Avenue/ SW Shaw Street

The SW 185th Avenue/SW Shaw Street intersection is a stop-controlled intersection 55-feet south of the railroad. There are crosswalks only on the east and west legs, and a 5' raised median is present on SW 185th Avenue. There are sidewalks and bicycle lanes on SW 185th Avenue.

As described previously, half-signals were identified as the most appropriate crossing treatment for a direct crossing along Shaw Street at the major intersections. The following describes the crossing alternatives including crossing at TV Highway and constructing a half-signal at the Shaw Street/SW 185th

Avenue intersection. Attachment D (page S-5) presents a plan view of the intersection design for Alternative A.

Alternative A (Cross at TV Highway)

For Alternative A, no crossing improvements are proposed at the intersection. Instead, widened sidewalks would be provided on SW 185th Avenue that would allow trail users to travel to TV Highway and cross there. This alternative would lead to approximately 300-feet of additional travel distance and higher delay due to long cycle lengths on TV Highway. However, this may be the only feasible alternative due to cost and technical challenges.

Alternative B (Half Signal)

Alternative B includes a half-signal for the northbound and southbound approaches of SW 185th Street allowing protected crossings for pedestrians and bicycles at SW Shaw Street. A cut through the existing center median on SW 185th Avenue would be needed. A plan view of this configuration is shown in Attachment F (page S-5).

In addition, an eastbound right-turn lane would be required on TV Highway to allow signalized stop control of eastbound right-turning movements. The half-signal would be coordinated with the signal at TV Highway; when the half-signals are activated via push buttons by a person using the trail, at TV Highway the eastbound and westbound through movements would get a green indication but the eastbound right-turn would receive a red indication (with no right turns on red permitted) due to the lack of storage between TV Highway and Shaw Street. In addition, no westbound left-turns would be permitted while the half-signal was activated. Additional details about this configuration are included in the Traffic Memorandum.

This alternative is not recommended due to technical challenges with pole location, railroad coordination, and effects to TV Highway. Directing people walking and biking to cross at TV Highway (Alternative A) is not ideal for a regional trail; however, it will still allow people walking and biking to access TV Highway and use SW Shaw Street as a local connector.

Shaw Segment 2: SW 185th Avenue to SW 170th Avenue

A 50' ROW cross section is proposed along the corridor from SW 185th Avenue to SW 170th Avenue. Attachment D (pages S-6 through S-11) presents a plan view of the concept design, including the railroad's 30' offset and available ROW. The proposed concept design is outside of the railroad's 30' offset and within the TSP's planned ROW; however, there is some ROW encroachment on the south side of SW Shaw Street east of SW 178th Avenue and between SW 174th Avenue and SW 172nd Avenue.

Shaw Intersection 3: SW 170th Avenue/ SW Shaw Street

SW 170th Avenue/SW Shaw Street is a stop-controlled intersection 55-feet south of the railroad. There are no crosswalks and a 11' raised median is present on SW 170th Avenue. There are sidewalks and bicycle lanes on SW 170th Avenue. Attachment D (page S-10) presents a plan view of the intersection design for Alternative A.

Alternative A

For Alternative A, widened sidewalks are proposed on SW 170th Avenue that would allow trail users to travel to TV Highway and cross at the existing crosswalk. In addition, the sidewalk on the south side of the TV Highway/SW 170th Avenue intersection, which currently is a two-stage crossing with an island, should be made continuous. This alternative would lead to approximately 160-feet of additional travel distance, and higher delay due to long cycle lengths on TV Highway. However, this may be the only feasible alternative due to cost and technical challenges.

Alternative B (Half Signal)

Alternative B includes a half-signal for the northbound and southbound approaches of SW 170th Avenue allowing protected crossings for pedestrians and bicycles at SW Shaw Street. A cut through the center median on SW 170th Avenue would be needed.

This location would have similar design needs and challenges as described for Alternative B at SW 185th Avenue. Additionally, it is too close to the intersection of TV Highway with SW 170th Avenue to provide for adequate storage for vehicles waiting at the half signal; therefore, this alternative is not recommended.

Shaw Segment 3: SW 170th Avenue to SW 160th Avenue

A 50' ROW cross section is proposed along the corridor from SW 209th Avenue to SW 198th Avenue. Attachment D (pages S-10 through S-13) presents a plan view of the concept design, including the railroad's 30' offset and available ROW. The alignment is within the railroad's 30' offset and within the TSP's planned ROW.

Shaw Intersection 4: SW 160th Avenue/SW Shaw Street

SW 160th Avenue/SW Shaw Street is an off-set stop-controlled intersection. The portion west of SW 160th Avenue leg is located south of the railroad while the portion east of SW 160th Avenue is located north of the railroad and south of TV Highway. SW Shaw Street has a dead-end east of SW 160th Avenue. Trail users on Shaw Street would transition from the eastbound approach down SW 160th Avenue to SW Blanton Street to connect to the Westside Trail to the south and they would travel north on the sidewalk on the west side of SW 160th Avenue to TV Highway to access the Westside Trail to the north. Attachment D (page S-13) presents a plan view of the intersection design for Alternative A.

Alternative A (Cross at TV Highway or SW Blanton Street)

For Alternative A, no crossing improvements are proposed at the intersection. Instead, widened sidewalks are proposed on SW 160th Avenue that would allow trail users to travel to TV Highway and cross at the existing crosswalk to access the Westside Trail to the north or travel to Blanton Street to access the Westside Trail to the south. People coming from South Westside Trail to Shaw Street would cross at SW Blanton Street/SW 160th, and continue up the widened sidewalks on the west side of SW 160th Avenue to reach SW Shaw Street. This alternative does not lead to additional travel distance or delay as most trail users would not be trying to continue to Shaw Street east of SW 160th Avenue as it is a dead end.

Alternative B (Half Signal)

Alternative B includes a half-signal for the northbound and southbound approaches of SW 160th Avenue allowing protected crossings for pedestrians and bicycles at SW Shaw Street.

This location would have similar design needs and challenges as described for Alternative B at SW 185th Avenue and is not recommended as users can continue to the Westside Trail to the north and south using existing crossings at TV Highway and proposed crossings at SW Blanton Street without out of direction travel.

Cost Estimate

A planning level cost estimate was prepared for the SW Shaw Street concept design based on the proposed typical section of approximately 50 feet. The breakdown of costs is included in Attachment E.

The cost estimate from SW 198th Avenue to SW 160th Avenue includes stormwater management, lighting, and right-of-way. Costs of stormwater management includes permanent landscaping. The crossings and potential fencing are estimated separately based on their uncertainty of cost and feasibility. The right-of-way estimate assumes that right-of-way is needed from approximately 60 properties in order to keep the improvements outside of the railroad 30-foot offset areas. The cost estimate also includes engineering and contingencies.

Costs to connect the trail to the separated bike lanes in South Hillsboro that start at SW 209th Avenue/SW Blanton Street are based on the costs to improve SW Blanton Street plus the need for a shared use path on the west side of SW 198th Avenue between SW Shaw Street and SW Blanton Street.

Construction + 30% Contingency \$12,400,000

Engineering (30%) \$3,700,000

Right-of-way \$1,700,000

Shaw Sub-Total \$17,800,000 (\$9,900,000 per mile)

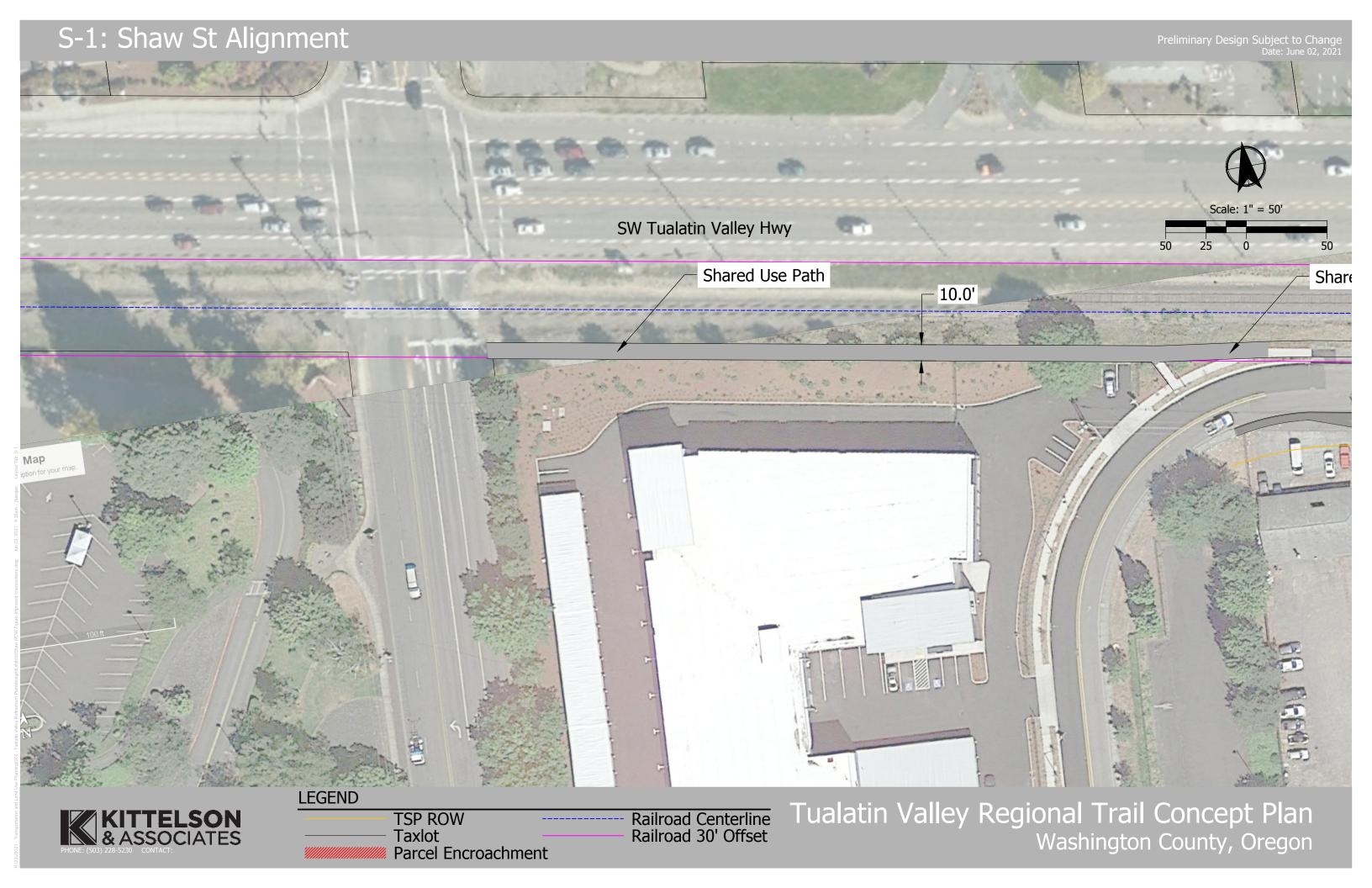
SW Blanton Street (209th – 198th) \$7,700,000

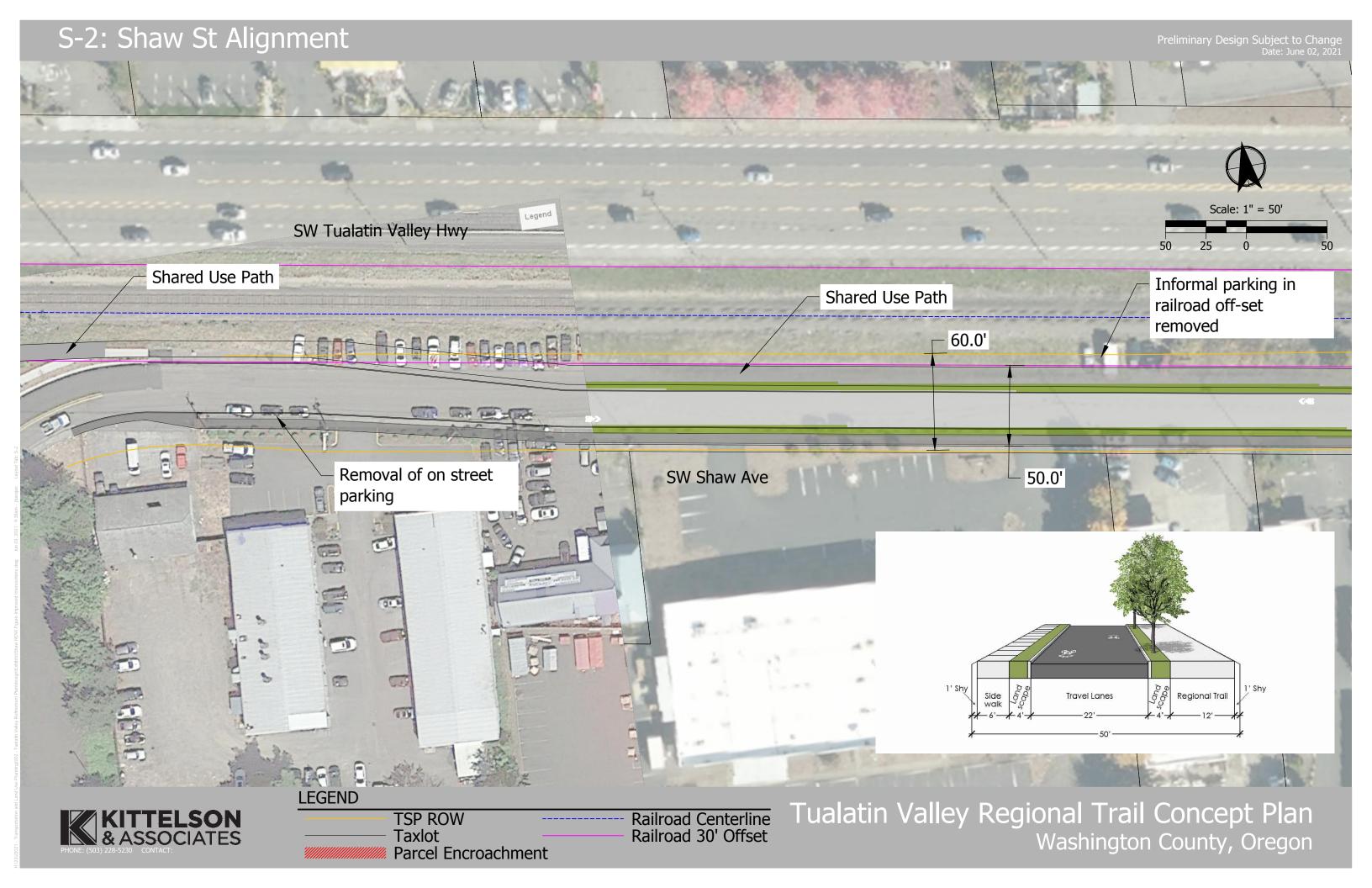
Railroad Crossings and Half Signals \$7,700,000

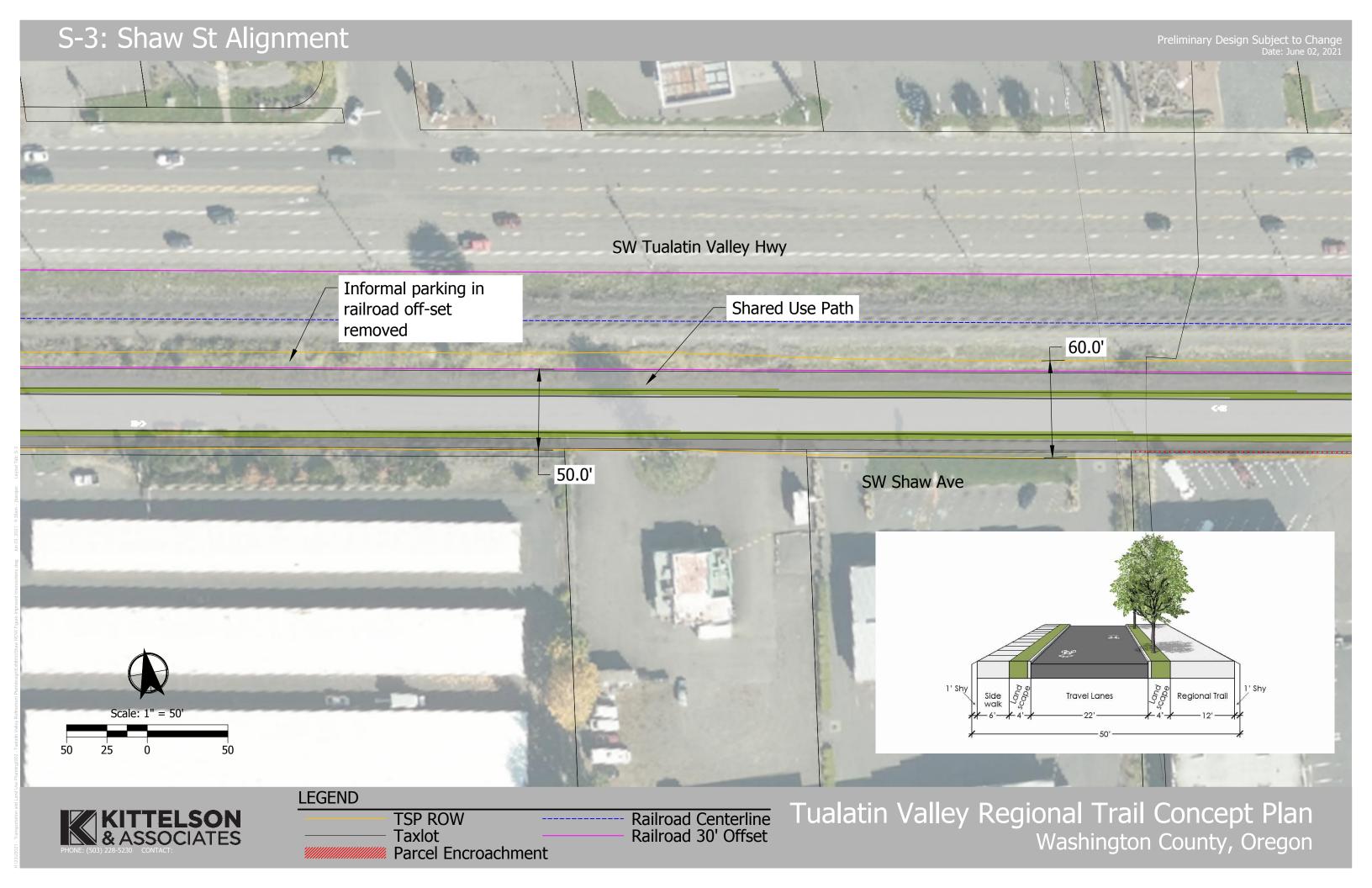
Fencing \$500,000

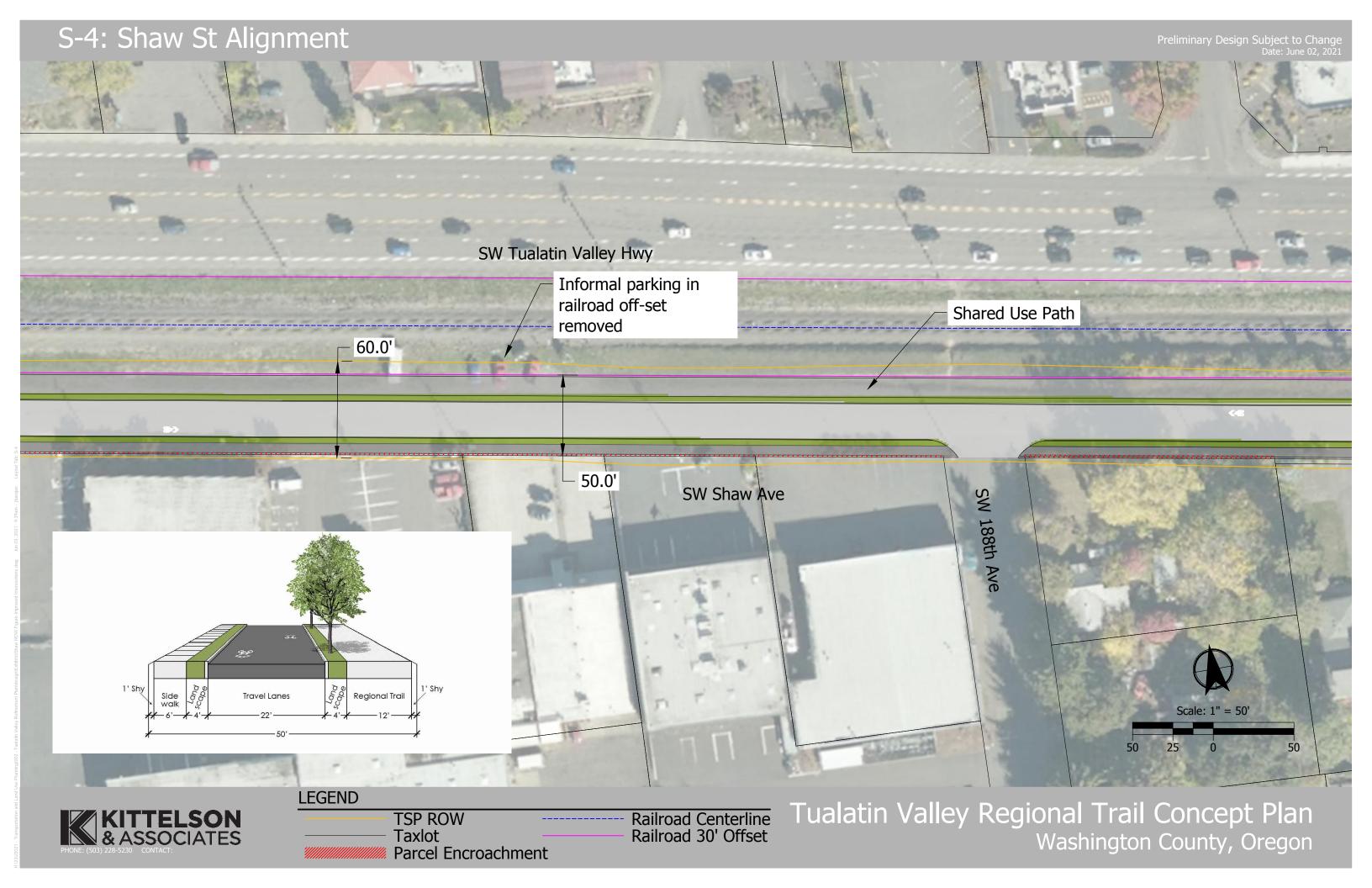
Total \$33,700,000

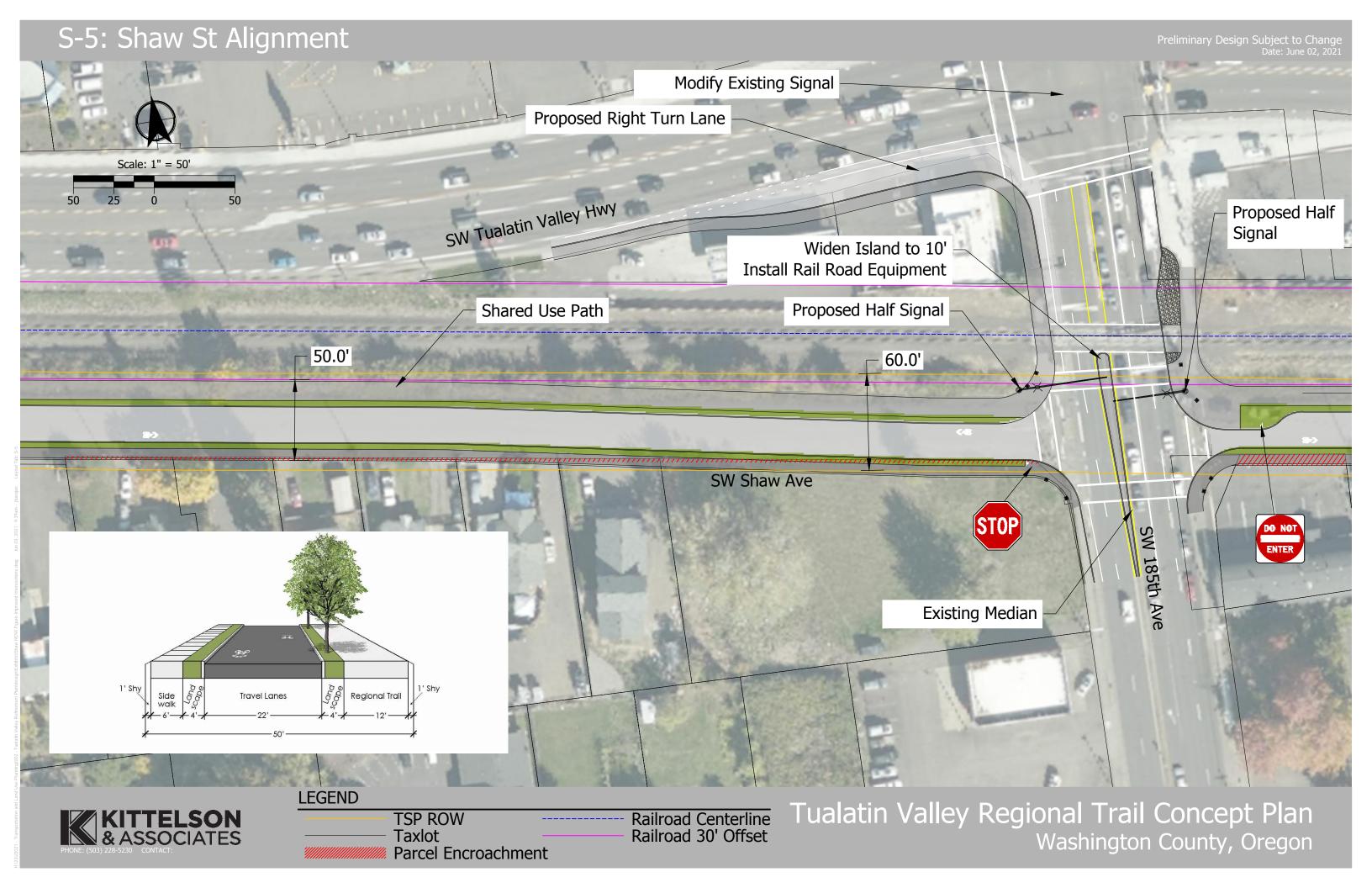


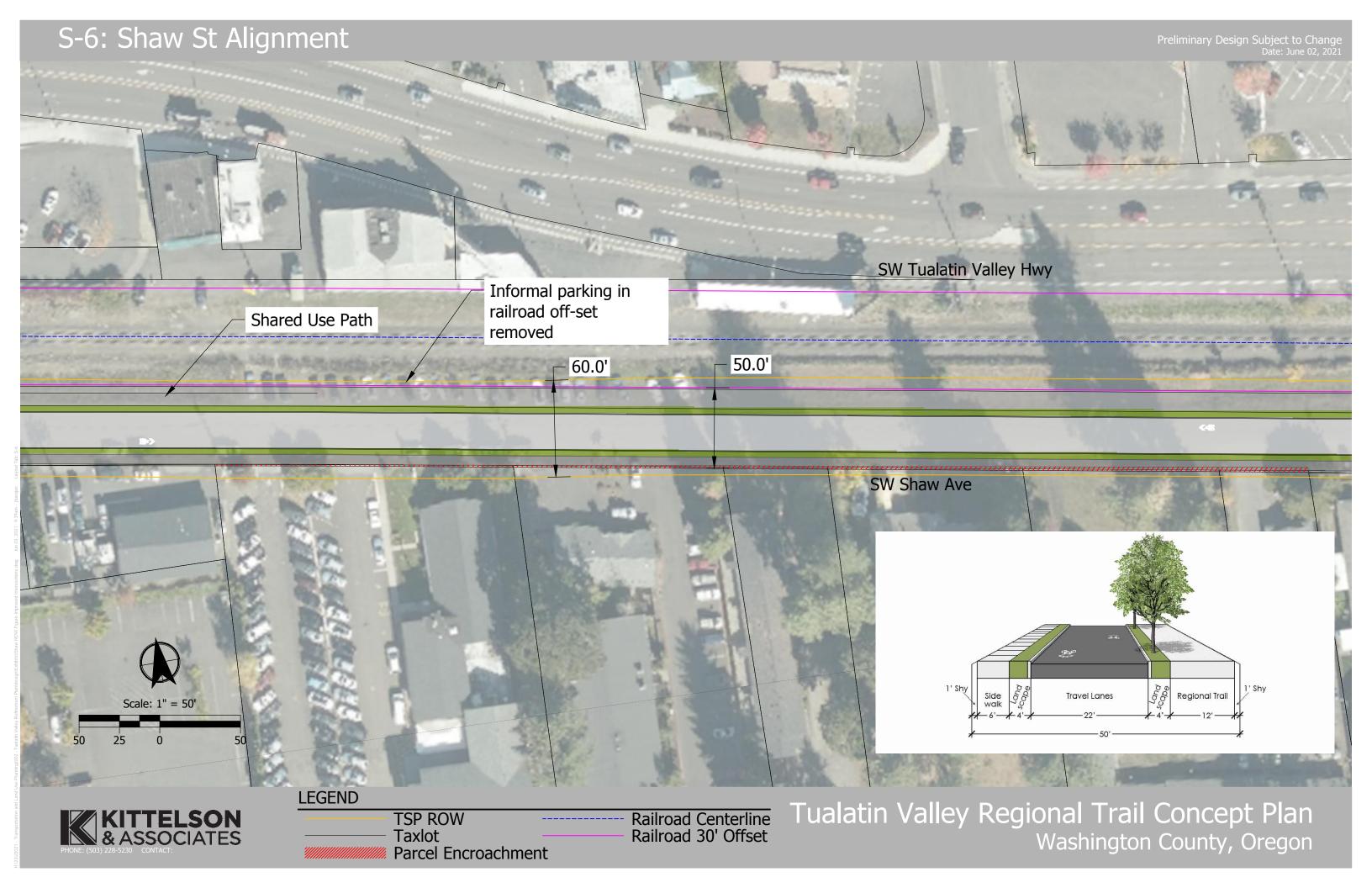


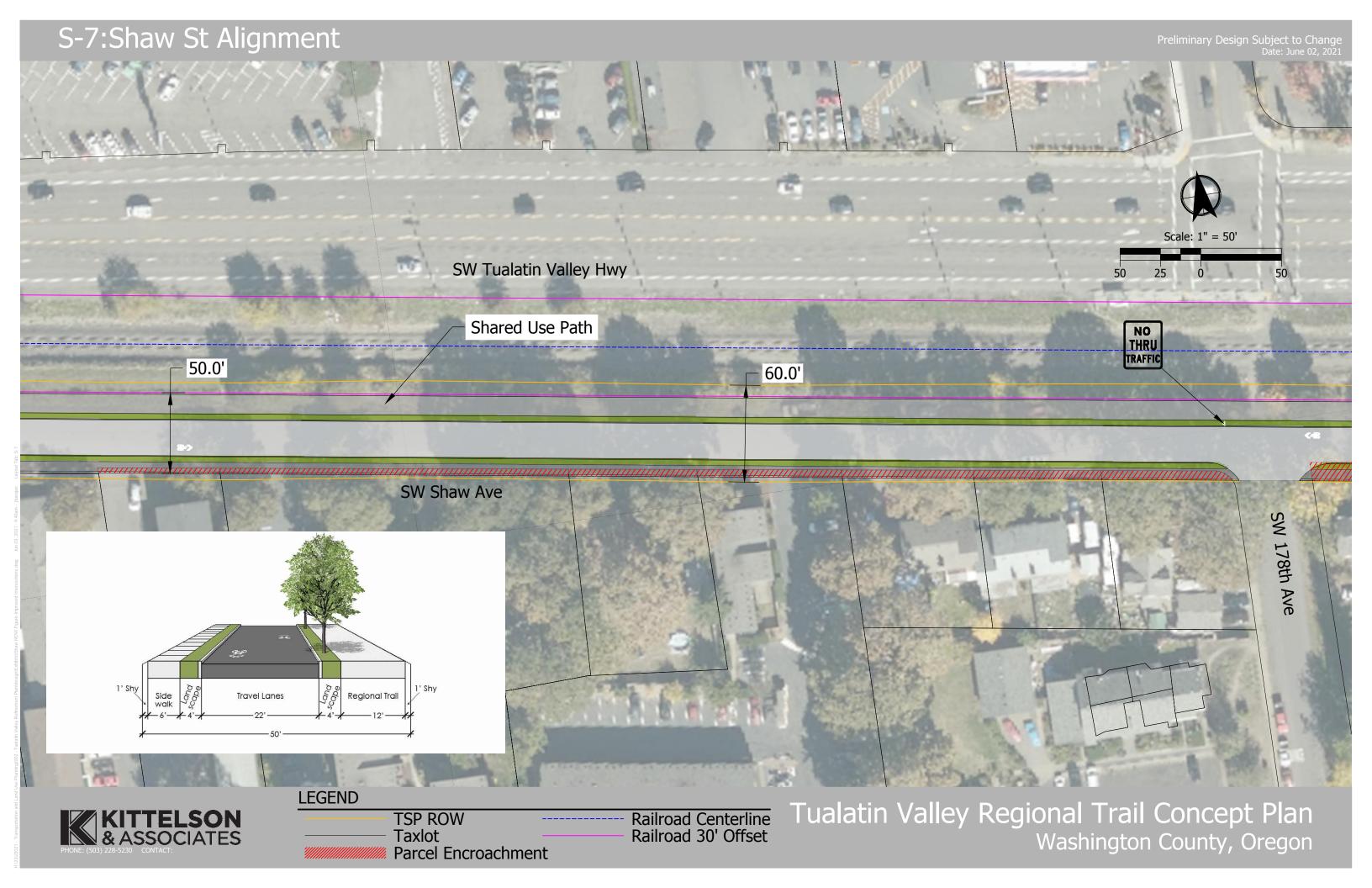


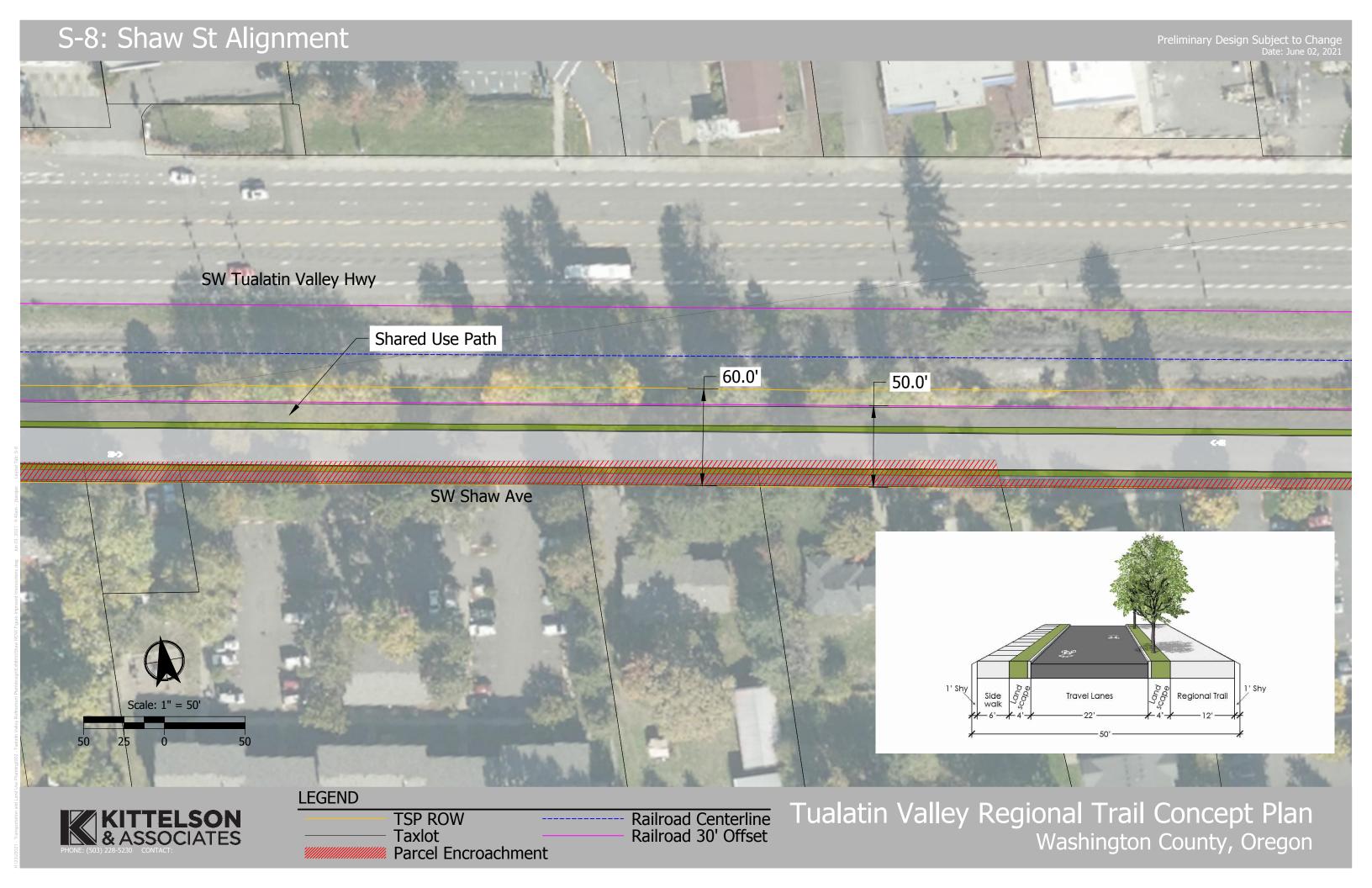


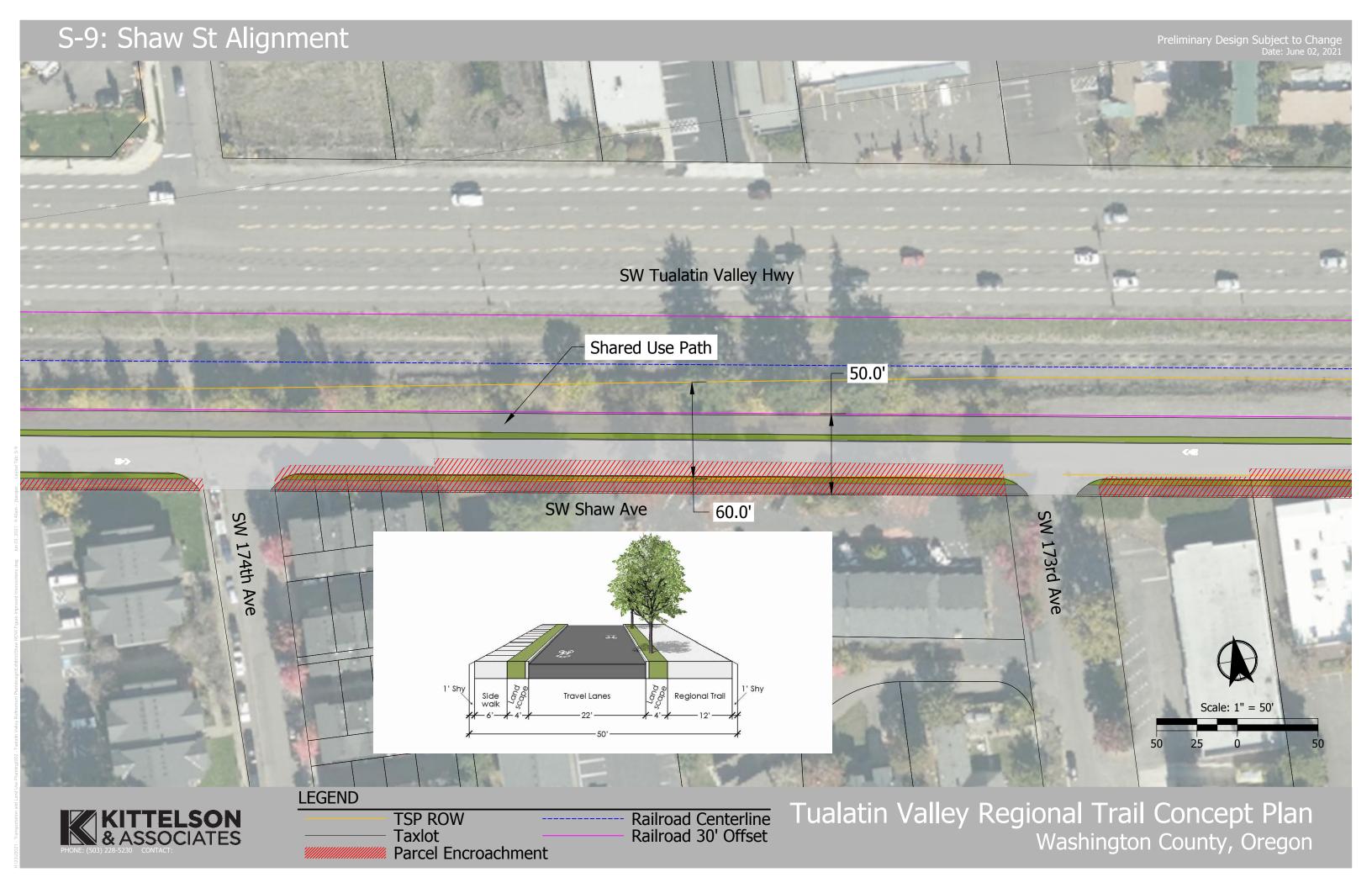


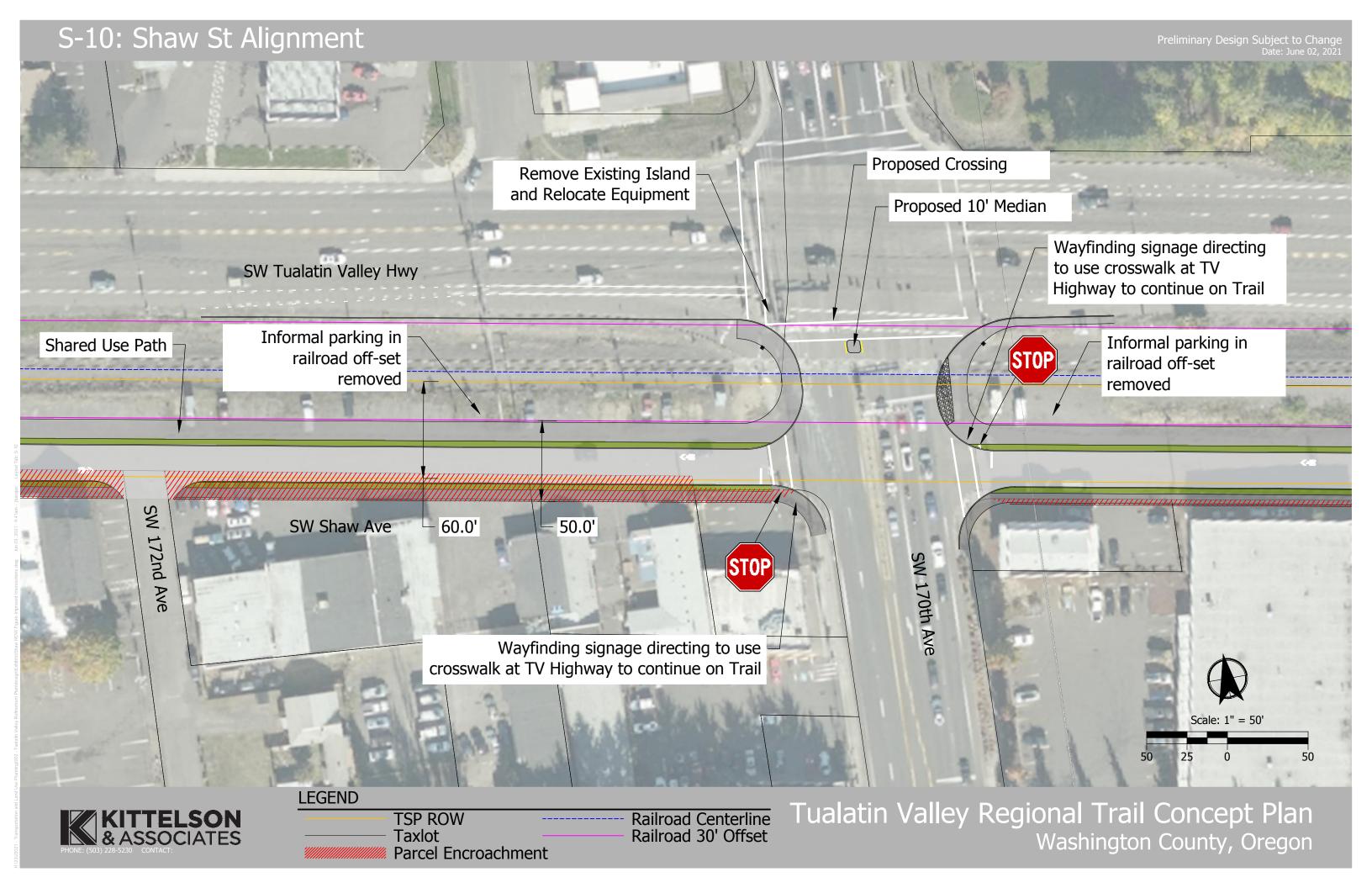


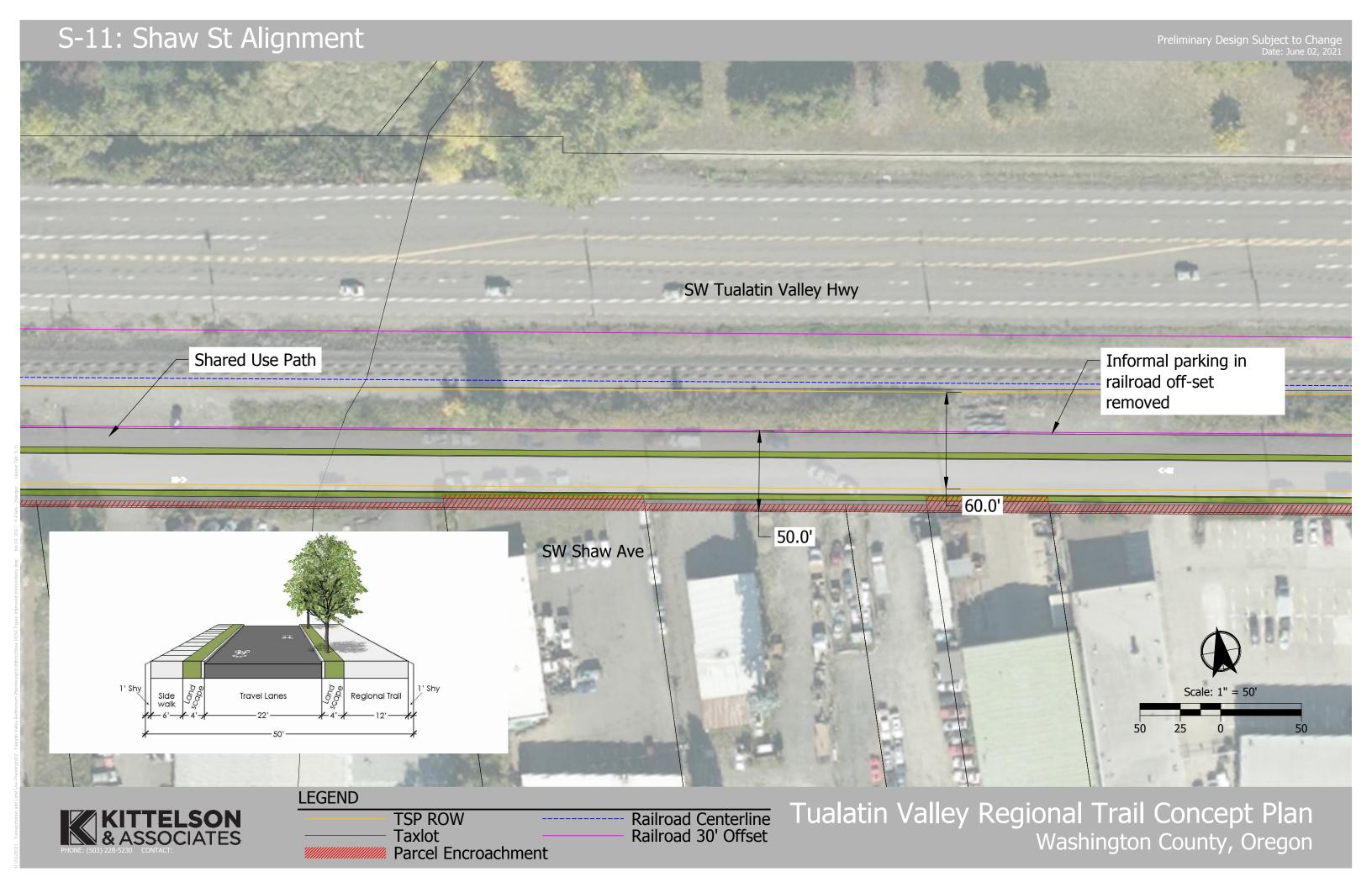


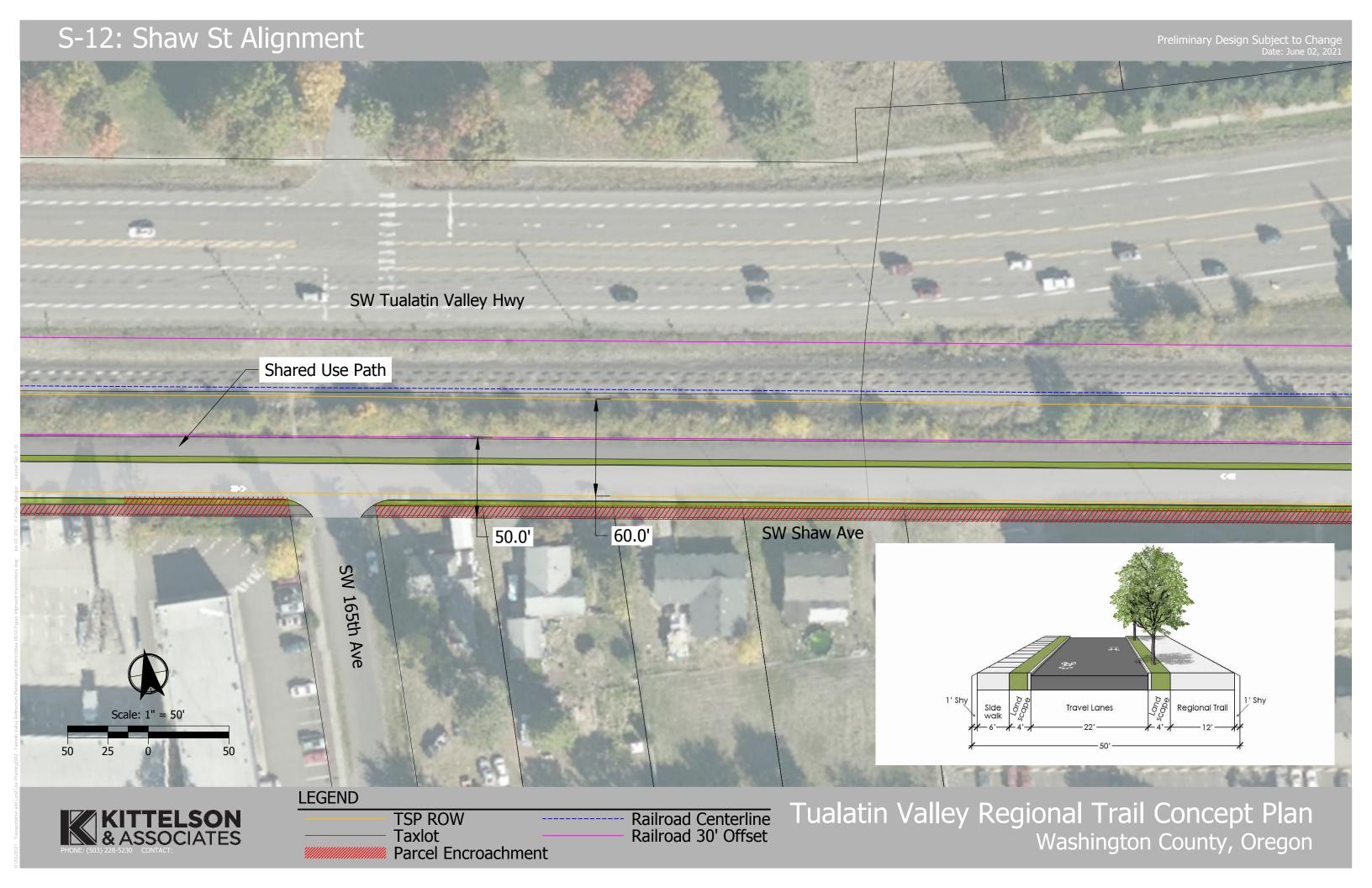


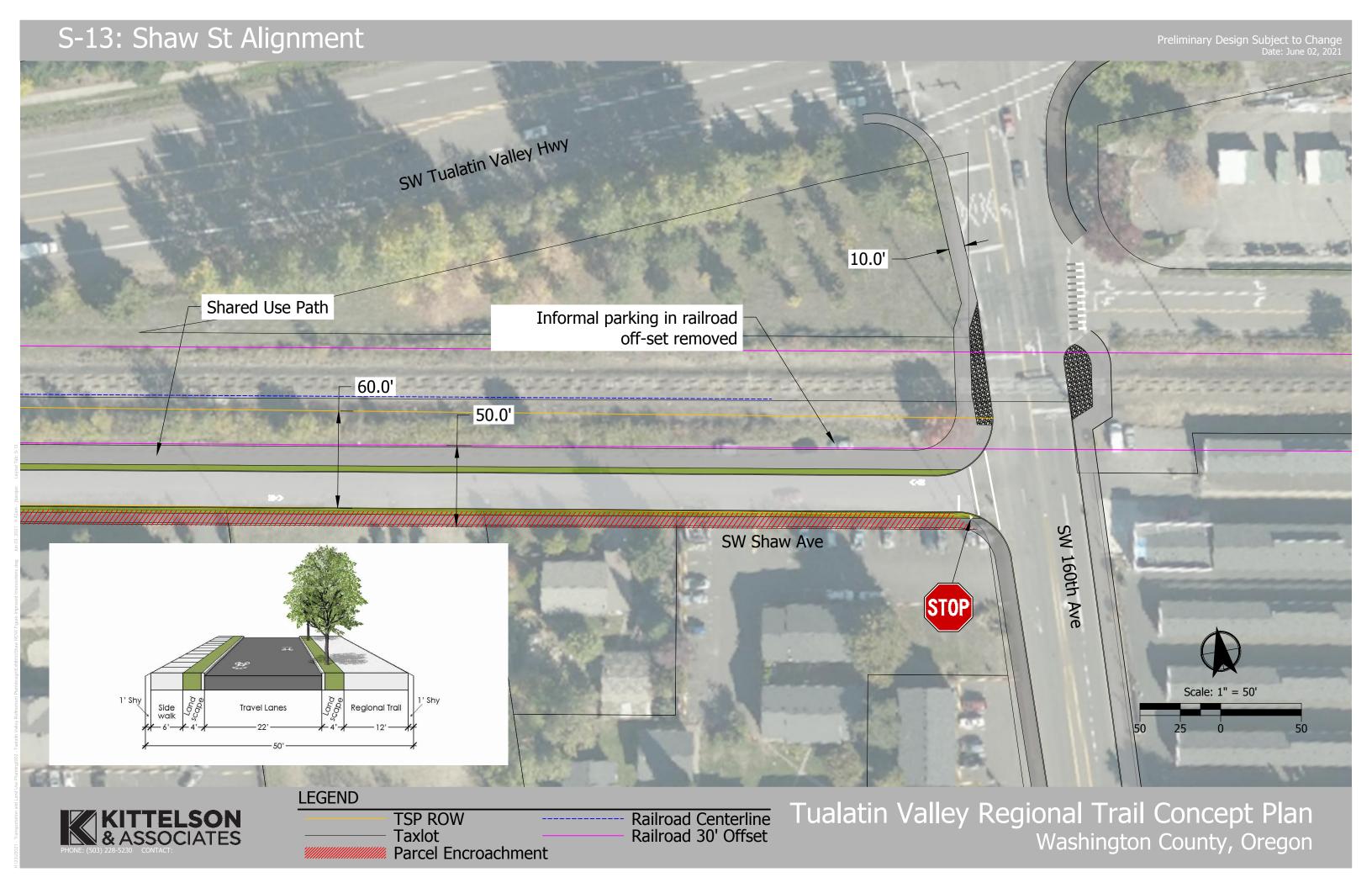














Tualatin Valley Regional Trail Concept Plan Shaw St Alignment (SW 198th Ave to SW 160th Ave)





Engineer's Conceptual Estimate	2
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Prepared By: Juan Barajas		Date: April 28, 2021			
Reviewed By: Susan Wright		24(0), (6), (120)			
, ,	ate has a Rating of:	3C	(See rating scale gu	ide below.)	
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE TOTAL C		L COST
Mobilization	LS	ALL	\$816,000.00		\$816,000.00
Traffic Control	LS	ALL	\$495,000.00		\$495,000.00
Erosion Control	LS	ALL	\$77,000.00		\$77,000.00
Removal of Structures and Obstructions	LS	ALL	\$382,000.00		\$382,000.00
Clearing and Grubbing	LS	ALL	\$153,000.00		\$153,000.00
General Earthworks	CY	20,400	\$25.00		\$510,000.00
Asphalt	TON	8,922	\$95.00		\$847,582.96
Subgrade Geotextile	SY	992	\$1.00		\$992.00
Concrete Curbs - Standard Curb & Gutter	LF	19,360	\$42.00		\$813,120.00
Concrete Walks (North)	SF	120,585	\$7.40		\$892,329.00
Concrete Walks (South)	SF	60,084	\$7.40		\$444,621.60
Aggregate	CY	12,890	\$45.00		\$580,066.67
Detectable Warnings	EA	30	\$500.00		\$15,000.00
Extra for Driveways	EA	59	\$8,000.00		\$472,000.00
Extra for Pedestrian Ramps	EA	56	\$3,000.00		\$168,000.00
Extra for Side Street Connections	EA	6	\$25,000.00		\$150,000.00
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$1,661,000.00	,	\$1,661,000.00
Permanent Landscaping	SF	63,949	\$3.70		\$236,611.30
Pavement Markings, Complete	LS	ALL	\$95,000.00		\$95,000.00
Signage, Complete	LS	ALL	\$72,000.00		\$72,000.00
Illumination System, Complete	LS	ALL	\$664,200.00		\$664,200.00
					,
		3	0% Contingency	\$	2,863,660
	CONS	TRUCTION CO	ST SUBTOTAL	\$ 1	2,409,184
30% Engineering					3,722,760
Right of Way Impact Area	SF	53,745	\$20.00	,	\$1,074,900.00
Right of Way Parcels Impacted	EA	59	\$10,000.00		\$590,000.00
	TOTAL	ESTIMATED P	ROJECT COST	\$ 1	7,796,844
	ESTIMATE	ED PROJECT C	OST PER MILE	\$	9,887,135
ESTII	MATED PROJEC	T COST PER I	MILE (NO ROW)	\$	8,962,191

Assumptions:

- ROW avoids building impacts

Scope Accuracy:

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Tualatin Valley Regional Trail Concept Plan Shaw St Alignment (SW 185th Ave Intersection Improvements)



Washington County

repared By: Juan Barajas		Date: May 20, 202	1	
eviewed By: Susan Wright				
This Estimate has	a Rating of:	3C	(See rating scale gu	iide below.)
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
Mobilization	LS	ALL	\$136,000.00	\$136,000.0
Traffic Control	LS	ALL	\$82,000.00	\$82,000.0
Erosion Control	LS	ALL	\$4,000.00	\$4,000.0
Removal of Structures and Obstructions	LS	ALL	\$64,000.00	\$64,000.0
Clearing and Grubbing	LS	ALL	\$26,000.00	\$26,000.0
General Earthworks	CY	1.000	\$25.00	\$25,000.0
Asphalt	TON	258	\$95.00	\$24,465.4
Subgrade Geotextile	SY	29	\$1.00	\$29.0
Concrete Curbs - Standard Curb	LF	285	\$27.90	\$7,951.
Concrete Curbs - Standard Curb & Gutter	LF	875	\$42.00	\$36,750.0
Raised Concrete Island	SF	740	\$10.90	\$8,066.0
Concrete Walks	SF	5,508	\$7.40	\$40,759.
Aggregate	CY	699	\$45.00	\$31,466.2
Detectable Warnings	EA	6	\$500.00	\$3,000.0
Extra for Driveways	EA	2	\$8,000.00	\$16,000.0
Extra for Pedestrian Ramps	EA	6	\$3,000.00	\$18,000.0
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$75,000.00	\$75,000.0
Pavement Markings, Complete	LS	ALL	\$5,000.00	\$5,000.0
Signage, Complete	LS	ALL	\$4,000.00	\$4,000.0
Illumination System, Complete	LS	ALL	\$29,700.00	\$29,700.0
Contractor Insurance for Railroad Crossing	LS	ALL	\$10,000.00	\$10,000.0
185th/Shaw Intersection Traffic Half Signal, Complete	LS	ALL	\$150,000.00	\$150,000.0
185th/TV HWY Intersection Traffic Signal Modification, Complete	LS	ALL	\$50,000.00	\$50,000.0
Railroad Crossing Surface	LS	ALL	\$305,000.00	\$305,000.0
Railroad Crossing Signal System	LS	ALL	\$425,000.00	\$425,000.
		3	0% Contingency	\$ 473,16
	CONS		ST SUBTOTAL	
			80% Engineering	
Right of Way Impact Area	SF	3,043	\$20.00	\$60,860.
Right of Way Parcels Impacted	EA	2	\$10,000.00	\$20,000.
1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			ROJECT COST	

Assumptions:

- ROW avoids building impacts

Scope Accuracy:

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Tualatin Valley Regional Trail Concept Plan Shaw St Alignment (SW 170th Ave Intersection Improvements)



Washington County

repared By: Juan Barajas		Date: May 20, 202	1			
eviewed By: Susan Wright						
This Estimate	has a Rating of:	3C	(See rating scale gu	e rating scale guide below.)		
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE		TOTAL COST	
Mobilization	LS	ALL	\$98,000.00		\$98,000.0	
Traffic Control	LS	ALL	\$59,000.00		\$59,000.0	
Erosion Control	LS	ALL	\$2,000.00		\$2,000.0	
Removal of Structures and Obstructions	LS	ALL	\$46,000.00		\$46,000.0	
Clearing and Grubbing	LS	ALL	\$19,000.00		\$19,000.0	
General Earthworks	CY	300	\$25.00		\$7,500.0	
Concrete Curbs - Standard Curb & Gutter	LF	615	\$42.00		\$25,830.0	
Concrete Walks (North)	SF	2,235	\$7.40		\$16,539.0	
Aggregate	CY	176	\$45.00		\$7,904.1	
Detectable Warnings	EA	4	\$500.00		\$2,000.0	
Extra for Pedestrian Ramps	EA	6	\$3,000.00		\$18,000.0	
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$28,000.00		\$28,000.0	
Pavement Markings, Complete	LS	ALL	\$2,000.00		\$2,000.0	
Signage, Complete	LS	ALL	\$2,000.00		\$2,000.0	
Illumination System, Complete	LS	ALL	\$10,900.00		\$10,900.0	
Contractor Insurance for Railroad Crossing	LS	ALL	\$10,000.00		\$10,000.0	
SW 170th Ave Traffic Signal Modifications, Complete	LS	ALL	\$50,000.00		\$50,000.0	
Railroad Crossing Surface	LS	ALL	\$305,000.00		\$305,000.0	
Railroad Crossing Signal System	LS	ALL	\$425,000.00		\$425,000.0	
		3	0% Contingency	\$	340,41	
	CONS	TRUCTION CO	ST SUBTOTAL	\$	1,475,083	
		3	80% Engineering	\$	442,530	
Right of Way Impact Area	SF	53,745	\$20.00		\$1,074,900.0	
Right of Way Parcels Impacted	EA	59	\$10,000.00		\$590,000.0	
	TOTAL	ESTIMATED P	ROJECT COST	\$	3,582,51	

Assumptions:

- ROW avoids building impacts

Scope Accuracy:

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Tualatin Valley Regional Trail Concept Plan Shaw St Alignment (SW 160th Ave Intersection Improvements)



Washington County

Prepared By: Juan Barajas		I	Date: May 20, 2021	1		
Reviewed By: Susan Wright						
	This Estimate has a Rating	of:	3C	(See rating scale gu	iide b	pelow.)
ITEM	UNIT		TOTAL QUANTITY	UNIT PRICE		TOTAL COST
Mobilization	LS		ALL	\$66,000.00	Ц	\$66,000.00
Traffic Control	LS		ALL	\$40,000.00	<u></u>	\$40,000.00
Removal of Structures and Obstructions	LS		ALL	\$31,000.00	L	\$31,000.00
Clearing and Grubbing	LS		ALL	\$13,000.00		\$13,000.00
Detectable Warnings	EA		2	\$500.00	l	\$1,000.00
Extra for Pedestrian Ramps	EA		6	\$3,000.00		\$18,000.00
Pavement Markings, Complete	LS		ALL	\$1,000.00	I	\$1,000.00
Signage, Complete	LS		ALL	\$1,000.00	I	\$1,000.00
Illumination System, Complete	LS		ALL	\$2,700.00	I	\$2,700.00
Railroad Crossing Surface	LS		ALL	\$265,000.00	I	\$265,000.00
Railroad Crossing Signal System	LS		ALL	\$325,000.00	I	\$325,000.00
			3(0% Contingency	\$	229,110
	СО	NST	TRUCTION CO	ST SUBTOTAL	\$	992,810
			3	0% Engineering	\$	297,850
Right of Way Impact Area	SF		0	\$20.00		\$0.00
Right of Way Parcels Impacted	EA		0	\$10,000.00		\$0.00
	тот	AL	ESTIMATED P	ROJECT COST	\$	1,290,660

Assumptions:

- ROW avoids building impacts

Scope Accuracy:

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Tualatin Valley Regional Trail Concept Plan Shaw St Alignment (SW 198th Ave to SW 160th Ave)





Engineer's Conceptual Estimate	2
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Prepared By: Juan Barajas		Date: April 28, 2021			
Reviewed By: Susan Wright		24(0), (6), (120)			
, ,	ate has a Rating of:	3C	(See rating scale gu	ide below.)	
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE TOTAL C		L COST
Mobilization	LS	ALL	\$816,000.00		\$816,000.00
Traffic Control	LS	ALL	\$495,000.00		\$495,000.00
Erosion Control	LS	ALL	\$77,000.00		\$77,000.00
Removal of Structures and Obstructions	LS	ALL	\$382,000.00		\$382,000.00
Clearing and Grubbing	LS	ALL	\$153,000.00		\$153,000.00
General Earthworks	CY	20,400	\$25.00		\$510,000.00
Asphalt	TON	8,922	\$95.00		\$847,582.96
Subgrade Geotextile	SY	992	\$1.00		\$992.00
Concrete Curbs - Standard Curb & Gutter	LF	19,360	\$42.00		\$813,120.00
Concrete Walks (North)	SF	120,585	\$7.40		\$892,329.00
Concrete Walks (South)	SF	60,084	\$7.40		\$444,621.60
Aggregate	CY	12,890	\$45.00		\$580,066.67
Detectable Warnings	EA	30	\$500.00		\$15,000.00
Extra for Driveways	EA	59	\$8,000.00		\$472,000.00
Extra for Pedestrian Ramps	EA	56	\$3,000.00		\$168,000.00
Extra for Side Street Connections	EA	6	\$25,000.00		\$150,000.00
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$1,661,000.00	,	\$1,661,000.00
Permanent Landscaping	SF	63,949	\$3.70		\$236,611.30
Pavement Markings, Complete	LS	ALL	\$95,000.00		\$95,000.00
Signage, Complete	LS	ALL	\$72,000.00		\$72,000.00
Illumination System, Complete	LS	ALL	\$664,200.00		\$664,200.00
					,
		3	0% Contingency	\$	2,863,660
	CONS	TRUCTION CO	ST SUBTOTAL	\$ 1	2,409,184
30% Engineering					3,722,760
Right of Way Impact Area	SF	53,745	\$20.00	,	\$1,074,900.00
Right of Way Parcels Impacted	EA	59	\$10,000.00		\$590,000.00
	TOTAL	ESTIMATED P	ROJECT COST	\$ 1	7,796,844
	ESTIMATE	ED PROJECT C	OST PER MILE	\$	9,887,135
ESTII	MATED PROJEC	T COST PER I	MILE (NO ROW)	\$	8,962,191

Assumptions:

- ROW avoids building impacts

Scope Accuracy:

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Tualatin Valley Regional Trail Concept Plan Shaw St Alignment (SW 185th Ave Intersection Improvements)



Washington County

repared By: Juan Barajas		Date: May 20, 202	1	
eviewed By: Susan Wright				
This Estimate has	a Rating of:	3C	(See rating scale gu	iide below.)
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE	TOTAL COST
Mobilization	LS	ALL	\$136,000.00	\$136,000.0
Traffic Control	LS	ALL	\$82,000.00	\$82,000.0
Erosion Control	LS	ALL	\$4,000.00	\$4,000.0
Removal of Structures and Obstructions	LS	ALL	\$64,000.00	\$64,000.0
Clearing and Grubbing	LS	ALL	\$26,000.00	\$26,000.0
General Earthworks	CY	1.000	\$25.00	\$25,000.0
Asphalt	TON	258	\$95.00	\$24,465.4
Subgrade Geotextile	SY	29	\$1.00	\$29.0
Concrete Curbs - Standard Curb	LF	285	\$27.90	\$7,951.
Concrete Curbs - Standard Curb & Gutter	LF	875	\$42.00	\$36,750.0
Raised Concrete Island	SF	740	\$10.90	\$8,066.0
Concrete Walks	SF	5,508	\$7.40	\$40,759.
Aggregate	CY	699	\$45.00	\$31,466.2
Detectable Warnings	EA	6	\$500.00	\$3,000.0
Extra for Driveways	EA	2	\$8,000.00	\$16,000.0
Extra for Pedestrian Ramps	EA	6	\$3,000.00	\$18,000.0
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$75,000.00	\$75,000.0
Pavement Markings, Complete	LS	ALL	\$5,000.00	\$5,000.0
Signage, Complete	LS	ALL	\$4,000.00	\$4,000.0
Illumination System, Complete	LS	ALL	\$29,700.00	\$29,700.0
Contractor Insurance for Railroad Crossing	LS	ALL	\$10,000.00	\$10,000.0
185th/Shaw Intersection Traffic Half Signal, Complete	LS	ALL	\$150,000.00	\$150,000.0
185th/TV HWY Intersection Traffic Signal Modification, Complete	LS	ALL	\$50,000.00	\$50,000.0
Railroad Crossing Surface	LS	ALL	\$305,000.00	\$305,000.0
Railroad Crossing Signal System	LS	ALL	\$425,000.00	\$425,000.
		3	0% Contingency	\$ 473,16
	CONS		ST SUBTOTAL	
			80% Engineering	
Right of Way Impact Area	SF	3,043	\$20.00	\$60,860.
Right of Way Parcels Impacted	EA	2	\$10,000.00	\$20,000.
1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			ROJECT COST	

Assumptions:

- ROW avoids building impacts

Scope Accuracy:

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Tualatin Valley Regional Trail Concept Plan Shaw St Alignment (SW 170th Ave Intersection Improvements)



Washington County

repared By: Juan Barajas		Date: May 20, 202	1			
eviewed By: Susan Wright						
This Estimate	has a Rating of:	3C	(See rating scale gu	e rating scale guide below.)		
ITEM	UNIT	TOTAL QUANTITY	UNIT PRICE		TOTAL COST	
Mobilization	LS	ALL	\$98,000.00		\$98,000.0	
Traffic Control	LS	ALL	\$59,000.00		\$59,000.0	
Erosion Control	LS	ALL	\$2,000.00		\$2,000.0	
Removal of Structures and Obstructions	LS	ALL	\$46,000.00		\$46,000.0	
Clearing and Grubbing	LS	ALL	\$19,000.00		\$19,000.0	
General Earthworks	CY	300	\$25.00		\$7,500.0	
Concrete Curbs - Standard Curb & Gutter	LF	615	\$42.00		\$25,830.0	
Concrete Walks (North)	SF	2,235	\$7.40		\$16,539.0	
Aggregate	CY	176	\$45.00		\$7,904.1	
Detectable Warnings	EA	4	\$500.00		\$2,000.0	
Extra for Pedestrian Ramps	EA	6	\$3,000.00		\$18,000.0	
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$28,000.00		\$28,000.0	
Pavement Markings, Complete	LS	ALL	\$2,000.00		\$2,000.0	
Signage, Complete	LS	ALL	\$2,000.00		\$2,000.0	
Illumination System, Complete	LS	ALL	\$10,900.00		\$10,900.0	
Contractor Insurance for Railroad Crossing	LS	ALL	\$10,000.00		\$10,000.0	
SW 170th Ave Traffic Signal Modifications, Complete	LS	ALL	\$50,000.00		\$50,000.0	
Railroad Crossing Surface	LS	ALL	\$305,000.00		\$305,000.0	
Railroad Crossing Signal System	LS	ALL	\$425,000.00		\$425,000.0	
		3	0% Contingency	\$	340,41	
	CONS	TRUCTION CO	ST SUBTOTAL	\$	1,475,083	
		3	80% Engineering	\$	442,530	
Right of Way Impact Area	SF	53,745	\$20.00		\$1,074,900.0	
Right of Way Parcels Impacted	EA	59	\$10,000.00		\$590,000.0	
	TOTAL	ESTIMATED P	ROJECT COST	\$	3,582,51	

Assumptions:

- ROW avoids building impacts

Scope Accuracy:

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Tualatin Valley Regional Trail Concept Plan Shaw St Alignment (SW 160th Ave Intersection Improvements)



Washington County

Prepared By: Juan Barajas		I	Date: May 20, 2021	1		
Reviewed By: Susan Wright						
	This Estimate has a Rating	of:	3C	(See rating scale gu	iide b	pelow.)
ITEM	UNIT		TOTAL QUANTITY	UNIT PRICE		TOTAL COST
Mobilization	LS		ALL	\$66,000.00	Ц	\$66,000.00
Traffic Control	LS		ALL	\$40,000.00	<u></u>	\$40,000.00
Removal of Structures and Obstructions	LS		ALL	\$31,000.00	L	\$31,000.00
Clearing and Grubbing	LS		ALL	\$13,000.00		\$13,000.00
Detectable Warnings	EA		2	\$500.00	l	\$1,000.00
Extra for Pedestrian Ramps	EA		6	\$3,000.00		\$18,000.00
Pavement Markings, Complete	LS		ALL	\$1,000.00	I	\$1,000.00
Signage, Complete	LS		ALL	\$1,000.00	I	\$1,000.00
Illumination System, Complete	LS		ALL	\$2,700.00	I	\$2,700.00
Railroad Crossing Surface	LS		ALL	\$265,000.00	I	\$265,000.00
Railroad Crossing Signal System	LS		ALL	\$325,000.00	I	\$325,000.00
			3(0% Contingency	\$	229,110
	СО	NST	TRUCTION CO	ST SUBTOTAL	\$	992,810
			3	0% Engineering	\$	297,850
Right of Way Impact Area	SF		0	\$20.00		\$0.00
Right of Way Parcels Impacted	EA		0	\$10,000.00		\$0.00
	тот	AL	ESTIMATED P	ROJECT COST	\$	1,290,660

Assumptions:

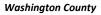
- ROW avoids building impacts

Scope Accuracy:

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Tualatin Valley Regional Trail Concept Plan Blanton St Alignment (SW 209th Ave to SW 160th Ave)





Engineer's	s Conceptual	Estimate
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Prepared By: Juan Barajas Date: April 28, 2021					
Reviewed By: Susan Wright	This Fation at a hour a Duting of	20	/C	.:- -	1
	This Estimate has a Rating of:	3C TOTAL	(See rating scale gu		
ITEM	UNIT	QUANTITY	UNIT PRICE	T	OTAL COST
Mobilization	LS	ALL	\$1,747,000.00		\$1,747,000.0
Traffic Control	LS	ALL	\$1,058,000.00		\$1,058,000.0
Erosion Control	LS	ALL	\$156,000.00		\$156,000.0
Removal of Structures and Obstructions	LS	ALL	\$817,000.00		\$817,000.0
Clearing and Grubbing	LS	ALL	\$327,000.00		\$327,000.0
General Earthworks	CY	41,500	\$25.00		\$1,037,500.0
Asphalt	TON	19,106	\$95.00		\$1,815,062.9
Subgrade Geotextile	SY	2,123	\$1.00		\$2,123.0
Concrete Curbs - Standard Curb & Gutter	LF	28,630	\$42.00		\$1,202,460.0
Raised Bicycle Lane	SF	146,114	\$7.40		\$1,081,243.6
Concrete Walks	SF	183,555	\$7.40		\$1,358,307.00
Aggregate	CY	26,144	\$45.00		\$1,176,466.6
Detectable Warnings	EA	98	\$500.00		\$49,000.00
Extra for Driveways	EA	185	\$8,000.00		\$1,480,000.00
Extra for Bike/Pedestrian Ramps	EA	178	\$3,000.00		\$534,000.00
Extra for Side Street Connections	EA	22	\$25,000.00		\$550,000.00
Storm Water System & Water Quality Treatment, Complete	LS	ALL	\$3,408,000.00		\$3,408,000.00
Permanent Landscaping	SF	101,060	\$3.70		\$373,922.00
Pavement Markings, Complete	LS	ALL	\$195,000.00		\$195,000.0
Signage, Complete	LS	ALL	\$147,000.00		\$147,000.0
Illumination System, Complete	LS	ALL	\$1,363,100.00		\$1,363,100.0
SW 170th Ave Traffic Signal Modifications, Complete	LS	ALL	\$50,000.00		\$50,000.0
SW 209th Ave Traffic Signal Modifications, Complete	LS	ALL	\$50,000.00		\$50,000.0
SW 198th Ave Traffic Half Signal, Complete	LS	ALL	\$150,000.00		\$150,000.0
SW 185th Ave Traffic Half Signal, Complete	LS	ALL	\$150,000.00		\$150,000.0
SW 160th Ave Traffic Half Signal, Complete	LS	ALL	\$150,000.00		\$150,000.0
		3	0% Contingency	\$	6,128,460
	CONS	TRUCTION CO	ST SUBTOTAL	\$	26,556,645
		3	0% Engineering	\$	7,967,000
Right of Way Impact Area	SF	74,915	\$15.00		\$1,123,725.0
Right of Way Parcels Impacted	EA	178	\$10,000.00		\$1,780,000.0
	TOTAL	ESTIMATED P	ROJECT COST	\$	37,427,370
	ESTIMATE	ED PROJECT C	OST PER MILE	\$	15,339,086
	ESTIMATED PROJEC			\$	14,149,035

Assumptions:

- ROW avoids building impacts

Scope Accuracy:

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:





Tualatin Valley Trail Refinement Plan

PUBLIC OUTREACH EXECUTIVE SUMMARY

Washington County and ODOT conducted public outreach between June 2020 and June 2021 to share information about the Tualatin Valley (TV) Trail Refinement Plan project and invited community members in Washington County, stakeholders, and other interested parties to share their ideas and feedback on potential trail options, including route, design, and implementation.

Feedback received through this outreach period helped the County and its consultants refine and develop two preferred alignment alternatives for TV Trail and identify near- and long-term opportunities to serve local and regional trail connectivity.

The **Public Engagement Plan**, developed by the project team at the beginning of the project, considered the demographic makeup of the project study area to inform outreach activities. In light of the COVID-19 pandemic, the project team adapted to provide several engagement opportunities (virtual, in-person and by mail) to enable community members to safely participate and provide meaningful input.

Over 550 people were engaged through a variety of outreach opportunities. These opportunities, as well as highlights from the feedback received, are summarized below.

Opportunities for engagement

- 2 Online open houses offered in English and Spanish with a total of 510 responses
 - Online open house #1 participation: 386
 participants provided comments in English, 1
 participant provided comments in Spanish
 - Online open house #1 also included virtual bike tours of each trail alternative
 - Online open house #2 participation: 123
 participants provided comments in English, there
 were zero responses in Spanish
- 2 In-person tabling events with a total of 20 participants
- **1 Spanish-language forum** with 5 participants
- 3 Small group stakeholder meetings held with Hillsboro and Beaverton School Districts, Tualatin Hills Park and Recreation District, and area employers.
- 4 Stakeholder Advisory Committee meetings with 11 members
- 4 Technical Advisory Committee meetings with 16 members from a variety of agencies and organizations
- The public were also given the opportunity to reach out to County staff to ask questions and share their thoughts on the project







How engagement opportunities were promoted

- Social media posts on the Washington County Facebook page, Nextdoor, Twitter, and Instagram
- Updates on the project websites in English and Spanish
- Postcards mailed to over 12,000 residents within the project study area advertising each of the online open houses and in-person tabling events
- Emails sent to interested parties, stakeholders, and community organizations
- Press releases for the online open houses
- Washington County e-newsletter

Public Feedback Key Themes

Overall, participants ranked **SW Blanton and SW Shaw** as being the best fit for a **TV Trail**. People showed a **slight preference for SW Blanton** over SW Shaw in the final open house.

When presented with the project goals, community members ranked Safety the highest, followed by Connectivity.

The public identified the following characteristics that will be important to creating a safe, comfortable, and accessible TV Trail:



- Connectivity to nearby community destinations, businesses, and regional trails
- **Separation between bike lanes, walking paths, and the road** (whether through on-street parking or landscape buffers)

Thoughts and concerns about Shaw:

- Generally regarded as unpleasant because of noise and air quality
- Concern about crossings at TV Highway and the railroad
- People liked that there was more space along Shaw and minimal impacts to private property
- Concern about loss of on-street parking
- A trail here could improve the area

Thoughts and concerns about Blanton:

- Potential impacts to private property and
- Conflicts between trail users and private driveways
- May worsen traffic through the neighborhood
- Perceived as "pleasant" to walk or bike on
- Availability of on-street parking
- Excitement for sidewalk improvements



Additional Feedback

There was general **concern about safety for pedestrians and bicyclists, especially children**. Speeding was mentioned as a key issue across the proposed trail corridors, and **traffic calming measures were generally important** to everyone, regardless of where TV Trail will ultimately be located.





Who we heard from

Online Open Houses: The majority of participants identified as white. The second largest racial or ethnic identity selected was Asian. The majority of respondents were 44 years of age or older, with almost a quarter sharing that there were between the ages of 45 and 54. The majority of respondents had a household income of \$75,000 or above and owned the place where they lived.

Who Supported Project Outreach

- Washington County
- Kittelson & Associates, Inc.
- JLA Public Involvement

What's Next?

With direction from the Washington County Board of County Commissioners, County staff will continue refining the Blanton Street and Shaw Street alternatives to determine which should be designated as the regional trail corridor and what improvements should move forward for each corridor regardless of the regional trail designation.

The County will amend the Washington County Comprehensive Plan, TSP, and Aloha- Reedville Community Plan to reflect the proposed plan for each corridor.

TUALATIN VALLEY TRAIL REFINEMENT PLAN

PUBLIC ENGAGEMENT PLAN



Prepared for:

Washington County



Prepared by:

JLA Public Involvement 921 SW Washington St, Ste 570 Portland, OR 97205



May 2020

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INTRODUCTION

This Public Involvement and Communications Plan (PICP) will guide stakeholder outreach and public involvement during the Tualatin Valley (TV) Trail Refinement Plan project. The PICP reflects commitments from Washington County, the Oregon Department of Transportation, and all their Consultants to carry out public involvement activities designed to keep stakeholders and the broader public engaged and informed about the project and its goals. This project is an opportunity to create a regional trail to connect key regional centers in Washington County (Beaverton, Aloha, and Hillsboro) and provide new multimodal connections for underserved communities in the TV Highway corridor. Public feedback is crucial to understanding both near-term and long-term transportation goals and impacts for the area.

PROJECT OVERVIEW

The TV Trail is a key part of the larger planned Turf-to-Surf Trail, which will eventually connect the Portland region with the Oregon Coast. The TV Trail will build upon previous and current planning efforts along the corridor, including the recently completed Aloha Tomorrow project. Tasks include evaluating alternative alignments for the trail, identifying a preferred alignment, developing a conceptual design and planning-level cost estimates, and recommending implementation strategies for phased development. Expected outcomes include a TV Trail Concept Plan that will be incorporated into Washington County's comprehensive plan, inform trail development and support future partnerships.

A Growing Region

Washington County is expected to experience significant growth over the next 20 years and continues to be among the fastest growing regions in the state. As the urbanized areas of Washington County continue to grow around already congested regional corridors, such as the TV Highway, there is a pressing need and desire to connect communities with safe, comfortable walking and biking routes accessible to people of all ages and abilities.

Currently, TV Highway, which connects Beaverton, Aloha, and Hillsboro, lacks safe, comfortable pedestrian and bicycle facilities. Barriers to walking, biking and accessing transit in the corridor include limited highway and railroad crossings, incomplete sidewalks, and inadequate bicycle facilities on both TV Highway and parallel routes. Local and regional plans have consistently recommended the need for separated bicycle facilities, better street lighting, more crossings for pedestrians, and improved access to bus stops along the TV Highway Corridor.

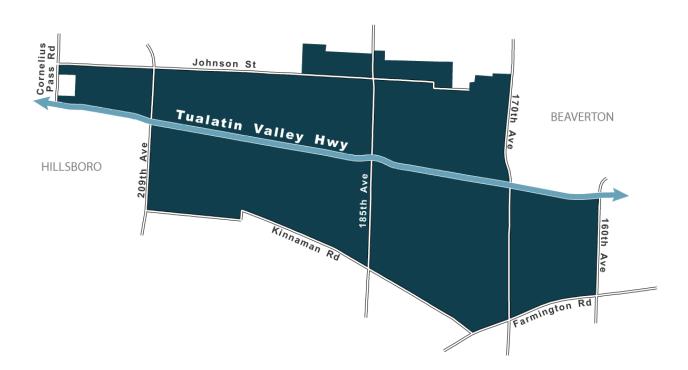
Project Objectives

The primary objectives of the project are to:

- Support the development of a safe, comfortable, convenient, and accessible trail for all users within the TV Highway corridor by:
 - o Identifying a preferred trail alignment for the TV Highway corridor.
 - Conceptualizing a trail design.
 - Creating connections to community and employment destinations including schools, transit stops, parks and recreation facilities, regional centers, and trail networks.
 - Analyzing and understanding potential benefits and burdens, including health impacts, environmental impacts, and impacts to historically marginalized communities.
 - Developing planning-level cost estimates for construction, ownership and long-term maintenance of a preferred trail alignment and design.

Project Area

The project area is centered on TV Highway, extending from SE Cornelius Pass Road in Hillsboro and east through Aloha, to SW 160th Avenue/SW Millikan Way in Beaverton. The project area also includes potential parallel routes located within a half mile of TV Highway.



Anticipated Project Timeline

This project is anticipated to take one year, beginning March 2020 through March 2021.

DEMOGRAPHIC DATA REVIEW: TITLE VI POPULATIONS

As part of the outreach to engage citizens and stakeholders in the TV Trail Refinement Plan, the project team will make specific efforts to involve historically underrepresented groups as well as the priority populations recognized by the 1994 Executive Order (E.O.) 12898. The demographic data below compiles census tracts within Washington County and the state of Oregon overall. The following demographic analysis used various tables from the 2013-17 5-Year American Community Survey (ACS) estimates and population forecasts from the Population Research Center at Portland State University.

How This Information Informs Public Engagement

Demographic information can help projects determine the best ways to engage with various community groups that live within a project area, including language translation and interpretation needs, public engagement activities that match the community's age and/ or backgrounds, and providing appropriate accommodations for disabilities.

About the Area Analyzed

The demographic analysis for this project looked separately at the demographics for the three cities that the TV Trail would connect: Aloha, Beaverton, and Hillsboro. These areas are compared to Washington County and the state of Oregon to understand the broader regional context and demographic trends. The area used for Aloha includes census tracts 316.06, 316.12, 316.13, 316.15, 317.03, 317.05, & 317.06. The areas used to analyze Beaverton and Hillsboro use the 'consolidated city' category from the American Community Survey.

Total Population

The total populations of Aloha, Beaverton, and Beaverton are estimated to be 39,533, 95,710, and 102,396 respectively. The combined population of these communities represents 41.5% of the total population of Washington County and 5.9% of the total population in the state of Oregon. According to forecasts done by the Population Research Center at Portland State University, the population of Washington County is expected to grow considerably in the future. By 2030, Washington County is expected to have 718,633 residents, an increase of 25.6%. By 2040, the Washington County population is expected to increase an additional 12.8%, to 810,303 residents.

Table 1. Total Population

Area	Estimate
Aloha	39,533
Beaverton	95,710
Hillsboro	102,396
Washington County	572,071
Oregon	4,025,127

Source: 2013-2017 American Community Survey 5-Year Estimates (DP05).

Note: The percentages included in this report are estimates from the American Community Survey. Each number comes with a margin of error, or an over/under range by which the estimate could be off. In some cases, the percentages will not add up to exactly 100% because of this margin of error.

Race & Ethnicity

Within Aloha, roughly 73% of residents identify as white, compared to approximately 79% of residents that identify as white in Beaverton and Hillsboro. All three communities show fewer people who identify as white than the 82% in Washington County or the 89% in Oregon overall, meaning that this area contains a greater amount of people of color. These communities have significantly higher percentages of people who identify as Black/African American, Asian, and other non-white races than Oregon as a whole or Washington County. Aloha and Hillsboro have higher percentages of people who identify as ethnically Hispanic/Latino than Washington County. All three communities in this area and Washington County have at least 16% or more people who identify as Hispanic/ Latino.

What this means for public involvement: The comparatively large proportion of racial and ethnic diversity in the project area, and in Washington County as a whole, means that the project team will need to work with community partners to reach groups who may not be connected to mainstream outlets or reached by traditional outreach techniques. Public engagement should strive to provide activities and information that reach the existing community in meaningful ways, including providing events and materials in multiple languages, partnering with community-based organizations (like Centro Cultural) to host meetings, and providing opportunities to engage that are welcoming and safe for everyone.

Table 2. Race and ethnicity alone or in combination with one or more other races

	Aloha	Beaverton	Hillsboro	Washington County	Oregon
Total population	39,533	95,710	102,396	572,071	4,025,127
White	72.6%	79.3%	79.4%	82.0%	89.1%
Black or African American	7.2%	3.4%	3.2%	3.0%	2.8%
American Indian and Alaska Native	1.4%	1.9%	3.5%	2.0%	3.1%
Asian	11.6%	13.9%	13.9%	12.3%	5.6%
Native Hawaiian and Other Pacific Islander	1.7%	1.0%	1.5%	1.1%	0.8%
Other race	11.7%	5.8%	6.8%	5.5%	3.5%
Ethnicity: Hispanic/ Latino	27.3%	16.4%	23.2%	16.4%	12.7%

Source: 2013-2017 American Community Survey 5-Year Estimates (DP05).

Age

The project area has a younger population than either Washington County or the state of Oregon overall, with the median age of 34.2 compared to Washington County's 36.4 years and Oregon's 39.2 years. There is a higher percentage of people aged 25-34 years in Beaverton and Hillsboro than in Washington County. Aloha has a higher percentage of children under the age of 5 than any of the other areas. All three communities have lower percentages of people over the age of 60 than the state of Oregon. These age trends mean that people living in the project area are likely to be younger, working, and have small children.

What this means for public involvement: Outreach and engagement efforts will need to be responsive to working families' availability and time restrictions, as well as provide opportunities both online and in-person. Additionally, in-person events should include childcare and/ or activities for children to keep all ages engaged.

Table 3. Age

	Aloha	Beaverton	Hillsboro	Washington County	Oregon
Total population	39,533	95,710	102,396	572,071	4,025,127
Under 5 years	8.9%	5.7%	7.4%	6.4%	5.8%
5-9 years	6.5%	5.8%	6.8%	6.6%	6.0%
10-14 years	7.1%	6.4%	6.5%	6.9%	6.0%
15-19 years	7.7%	5.4%	6.1%	6.2%	6.1%
20-24 years	7.1%	6.6%	6.3%	6.0%	6.6%
25-34 years	17.1%	18.0%	18.7%	15.4%	13.9%
35-44 years	15.8%	14.5%	15.7%	15.0%	13.1%
45-54 years	13.0%	13.4%	13.0%	13.5%	12.8%
55-59 years	4.9%	6.8%	5.5%	6.2%	6.7%
60-64 years	4.4%	5.3%	4.1%	5.5%	6.8%
65-74 years	5.1%	7.3%	6.2%	7.3%	9.8%
75-84 years	2.2%	2.9%	2.6%	3.2%	4.5%
85 years and older	0.5%	1.9%	1.2%	1.6%	2.1%
Median Age	32.5	36.1	34.0	36.4	39.2

Source: 2013-2017 American Community Survey 5-Year Estimates (DP05).

Sex

There is not a significant difference in proportions of sex in the project area, and therefore this information will not inform public engagement on this project.

Table 4. Sex

	Aloha	Beaverton	Hillsboro	Washington County	Oregon
Total population	39,533	95,710	102,396	572,071	4,025,127
Male (%)	49.6%	49.7%	49.3%	49.4%	49.5%
Female (%)	50.4%	50.3%	50.7%	50.6%	50.5%

Source: 2013-2017 American Community Survey 5-Year Estimates (DP05).

Disability

The project area cities have lower percentages of people living with all types of disabilities than the state of Oregon overall, and equivalent levels to Washington County.

What this means for public involvement: While required by the state, it is important that all in-person public events be held in ADA-accessible locations and online events adhere to ADA web standards.

Table 5. Disability Characteristics

	Aloha	Beaverton	Hillsboro	Washington County	Oregon
Percent of total population with a disability	10.6%	10.9%	9.6%	10.2%	14.6%
With a hearing difficulty	2.7%	2.7%	2.7%	2.9%	4.7%
With a vision difficulty	2.0%	1.7%	1.5%	1.7%	2.5%
With a cognitive difficulty	5.8%	5.5%	4.1%	4.6%	6.2%
With an ambulatory difficulty	4.7%	5.3%	5.1%	4.9%	7.5%
With a self-care difficulty	2.5%	2.3%	1.9%	2.0%	2.8%
With an independent living difficulty	5.2%	5.1%	4.5%	4.6%	6.1%

Source: 2013-2017 American Community Survey 5-Year Estimates (S1810).

Limited English Proficiency

Limited English proficiency looks at the number of people who speak a language other than English, *and* who also speak English less than "very well." Aloha, Beaverton, and Hillsboro all have higher percentages of people with limited English proficiency than both Washington County and Oregon as a whole. These communities also have lower amounts of people who speak only English, suggesting that more people are bilingual or multilingual.

Of the languages spoken by people with limited English proficiency, Asian and Pacific Islander languages, followed closely by Spanish, were the most common languages spoken besides English. Aloha had a higher percentage of people who speak "other" languages than any of the other cities, Washington County or Oregon.

What this means for public involvement: Higher levels of limited English proficiency means that outreach, engagement, and communications efforts will need to be done with language comprehension and reading levels in mind. Additionally, further research should also be done to identify which languages are included in *Asian and Pacific Islander languages* by working with community partners in the area such as APANO.

Table 6. Limited English Proficiency

Percentage of population who speak a language other than English and who speak English less than "very well"

	Aloha	Beaverton	Hillsboro	Washington County	Oregon
Population aged 5 years and over	37,047	90,269	94,844	535,299	3,793,273
English only	64.0%	73.4%	70.5%	75.7%	84.8%
Speak a language other than English, speak English less than "very well"	13.9%	10.8%	11.3%	9.1%	5.9%
Breakdown of those that speak a language other than English and speak English less than "very well"					
Spanish	8.2%	5.3%	7.4%	5.1%	3.6%
Other Indo-European languages	0.9%	5.4%	4.4%	0.7%	1.1%
Asian and Pacific Islander languages	3.5%	7.6%	7.2%	2.6%	1.4%
Other languages	1.3%	0.8%	0.8%	0.4%	0.2%

Source: 2013-2017 American Community Survey 5-Year Estimates (DP02)

Income & Poverty Status

Overall, the population of the project area has a higher median household income than the state of Oregon, but lower than Washington County. Aloha has the lowest median income of the three communities at \$60,992. There are more households in the area earning a "middle wage", between \$50,000 and \$149,000 annually, than in Washington County or in Oregon as a whole.

The project area has a higher rate of people who lived in poverty in the past 12 months than Washington County, between 10.8% and 18.1%. In Aloha, this is higher than the state of Oregon overall signifying that there is a wealth gap within the project area.

What this means for public involvement: The project will provide a mix of in-person and online engagement options to allow those who may be working non-traditional hours or more than one job an opportunity to participate on their own schedule.

Table 7. Poverty Status

	Aloha	Beaverton	Hillsboro	Washington County	Oregon
Total households	13,405	38,855	37,424	212,778	1,571,631
Less than \$10,000	5.4%	5.1%	3.4%	3.8%	6.5%
\$10,000-\$14,999	3.3%	3.9%	2.5%	3.0%	4.8%
\$15,000-\$24,999	7.6%	8.0%	7.3%	7.2%	10.0%
\$25,000-\$34,999	10.0%	8.6%	6.8%	7.9%	10.0%
\$35,000-\$49,999	13.5%	13.5%	10.8%	11.4%	13.5%
\$50,000-\$74,999	21.8%	17.2%	18.8%	17.5%	18.5%
\$75,000-\$99,000	17.3%	14.1%	17.0%	14.6%	12.9%
\$100,000-\$149,000	15.2%	16.7%	20.4%	18.4%	13.8%
\$150,000-\$199,999	3.5%	7.6%	7.4%	8.5%	5.0%
\$200,000 or more	2.4%	5.3%	5.6%	7.8%	5.0%
Median household income	\$60,992	\$64,619	\$75,599	\$74,033	\$56,119
Mean household income	\$71,760	\$82,039	\$87,763	\$93,043	\$75,851
Percentage of people whose income in the past 12 months is below the poverty level	18.1%	12.6%	10.8%	10.3%	14.9%

Source: 2013-2017 American Community Survey 5-Year Estimates (DP03).

Key Considerations for this Project

The above data shows that communities within the project area align more closely with the demographics of Washington County than those of the state of Oregon. Overall, residents in the project area are younger adults and young children; more racially, ethnically, and linguistically diverse; most have medium-high incomes, but a greater than 10% individual poverty level shows an underlying wealth gap. These conclusions are significant because this project will need to consider the transportation needs and impacts of all people in the area. With Washington County projected to grow significantly in the future, planned projects like the TV Trail will need to consider the needs and desires of all residents.

PUBLIC INVOLVEMENT PURPOSE AND GOALS

The purpose of the public involvement program is to share information and gather input on the needs, issues and options of potentially affected interests living near and served by the project area, as well as other stakeholders and interested parties.

The project's public involvement and communication goals are to:

- Communicate complete, accurate, understandable and timely information to the public throughout the project.
- Encourage meaningful participation by the community in the refinement of the TV Trail alignment and features.
- Identify and engage all potentially affected and/or interested individuals, communities, and organizations that live or travel through the project area or are otherwise supportive of the project.
- Provide public engagement opportunities that are inspiring and build excitement around the project.
- Demonstrate how input has influenced the process and is incorporated into the final refinement plan.
- Collaborate with interagency partners throughout the process.
- Comply with Civil Rights Act of 1964 Title VI requirements.
- Ensure that the public involvement process is consistent with applicable state and federal laws and requirements, and is sensitive to local policies, goals and objectives.

KEY MESSAGES

The following key messages will be communicated to the public throughout the project and will be updated periodically to reflect the current phase and focus of public engagement.

About

- Washington County is moving forward with plans for a Tualatin Valley (TV) Trail, which will run parallel to TV Highway (Oregon 8). It will connect Beaverton, Aloha and Hillsboro for biking, walking and more.
- The TV Trail will be an important part of the future Turf-to-Surf Trail, which will connect the Portland region with the Oregon Coast.
- The project will pick up from previous work in deciding the trail's details and specifics. It will become
 part of Washington County's larger plan for next few years (called the *comprehensive* plan). It will help
 the county decide how best to build and maintain the TV Trail and others, including through
 partnerships with other local governments and with businesses.

A regional trail for all

We want to provide safe and comfortable choices for traveling the TV Highway corridor and increase access to physical activity. The TV Trail will be a low-stress way to commute, recreate, or travel through by biking, walking and more.

- People in underserved communities will finally have a place that feels safe to walk and bike whether
 for fun and fitness or for getting to work, running errands, or catching a bus or MAX train.
- People traveling through will have the opportunity to stop at local businesses.
- When people do drive on TV Highway, they may find it safer and less congested.

What's included with a Concept Plan?

The Concept Plan will help define what to build, including:

- Which street the trail will be on.
- How we want the trail to look, and what features we need.
- How much it will cost to build, and also to own and maintain.
- Which parts we'll build soonest, and how much we'll build each year.

Once this current work is completed, the County, partners and/or project champions can take the next steps work on securing funding to design and construct the trail.

Route options

Currently, we are considering several route options:

- SW Johnson Street
- SW Alexander Street
- TV Highway (south side) / Portland and Western Railroad Tillamook District corridor
- SW Shaw Street
- SW Blanton Street

Help us get rolling on the plan!

- We envision designing a trail that's inviting to everyone, for commuting, exercising or for traveling through the area.
- We need your input on which route offers the best experience (access to nature, least amount of
 exposure to traffic, most connections to community destinations, brings the community together, etc.),
 what features the trail should include and how to get it built.
- With the Coronavirus pandemic in mind, we plan to offer a variety of safe and healthy opportunities to provide input.
- Visit the project website to learn more and sign up for project updates.

CONCURRENT EFFORTS AND COORDINATION

There are other regionally significant planning projects that have overlapping goals and activities occurring concurrently with this project. It is important to be aware of these efforts to ensure that outreach and messaging are consistent and, when possible, coordinate outreach activities to reduce public confusion and redundancies. These projects include:

- Get Moving 2020 (Transportation Funding Package) Metro has worked with local leaders and community members to develop a plan to fix the region's most dangerous and congested streets and give people more transportation choices across a range of regional mobility corridors. TV Highway has been identified as a Tier 1 corridor and the proposed access and safety improvements are a high priority for the funding package. The funding package is tentatively scheduled to go on the November 2020 ballot.
- Council Creek Regional Trail The Council Creek Regional Trail (CCRT) Master Plan completed in 2015 envisions "a multiuse pathway for pedestrians, bicyclists, and other non-motorized travelers for

both recreational and transportation purposes." The trail will extend almost 15 miles from the Banks-Vernonia Trail in Banks to the TriMet Blue Line MAX station in downtown Hillsboro, and is defined within two separate sections. The North-South Trail Corridor extends approximately 9 miles from the north side of the City of Banks to the City of Forest Grove. The East-West Trail Corridor extends for approximately 5.5 miles from downtown Forest Grove to downtown Hillsboro.

- Salmonberry Trail The SBT is a proposed non-motorized, mixed-use recreation path that would stretch 84 miles along the alignment of the former Port of Tillamook Bay Railroad (from Banks to Wheeler and then down the coast to Tillamook). It is envisioned as a trail that would serve hikers, bikers and horseback riders and help connect the urban communities of the Portland area with rural and coastal communities along the route.
- Moving Forward TV Highway (Past Project) Moving Forward TV Highway was completed by Washington County in 2019 and was focused on improving transit and traveler safety between SE Cornelius Pass Road and SW 160th Avenue. The project included identification, evaluation and recommendations to improve bus speeds and reliability along the TV Highway corridor. It also identified and prioritized pedestrian and bicycle connections needed to create safer access to transit in the area, including new sidewalks, bicycle lanes, and enhanced crossing treatments.
- Aloha Tomorrow (Past Project) Washington County developed implementation steps in 2017 to
 advance detailed land use and transportation recommendations for the Town Center Focus Area
 centered at TV Highway and SW 185th Ave, supporting a community vision for a walkable, vibrant, and
 livable town center with a mix of commercial, residential, and civic uses outlined in the Aloha-Reedville
 Study and Livable Community Plan. Aloha Tomorrow included an initial concept design for the TV Trail.

AUDIENCES

The public involvement process will seek to inform and engage the following types of affected and interested people and organizations in the project area:

- The broader Aloha, Beaverton, and Hillsboro community
- Elected officials from Washington County, Beaverton, and Hillsboro
- Nearby Washington County residents
- Technical Advisory Committee
- Agency partners working on related plans or projects
- Area businesses and business organizations
- Bike and pedestrian interests
 - WashCo Bikes
 - The Street Trust
 - Turf-to-Surf Trail supporters
 - Intertwine Alliance
 - Salmonberry Trail
 - Council Creek Regional Trail

- Friends of Yamhelas Westsider Trail
- Transit interests, including current or potential passenger transit
- Freight interests
- Environmental interests
 - Beaverton Creek Wetlands
 Natural Area
 - Jackson Bottom Wetlands
- Accessibility groups
- Senior services
- Tourism interests
 - Tualatin Valley Tourism
 - Washington County Visitor's Association
 - Travel Oregon
- Community groups and organizations

- Centro Cultural de Washington County
- Oregon Korean Community
 Center
- Asian Health & Services Center (APANO)
- o Adelante Mujeres
- o Bienestar Oregon
- o Unite Oregon
- School Districts
 - Hillsboro

- Beaverton
- Housing and community development interests
- Emergency services providers
- Local event organizers
- Recreational interests and recreational users
 - Tualatin Hills Parks & Recreation Department
 - The Reserve Vineyard & Golf Club
 - Merriweather National Golf Club

PROJECT TEAM MEMBER ROLES AND RESPONSIBILITIES FOR PUBLIC INVOLVEMENT

Washington County

- Dyami Valentine, Project Lead and Senior Transportation Planner Dyami serves on the Project
 Management Team (PMT) and will provide strategy for and review of all public engagement activities
 and deliverables to ensure they meet County goals and align with other County planning projects.
- Reza Farhoodi, Deputy Project Lead and Associate Planner Reza provides consistency between
 this project and Moving Forward TV Highway and will review public engagement deliverables as
 needed.

ODOT

• Talia Jacobson, Region 1, Project Contract and Funding Administrator – Talia provides project oversight to ensure that the project meets state requirements and objectives of reaching affected community members and organizations within the project area and surrounding areas.

Kittelson & Associates, Inc.

- Susan Wright, Consultant Project Manager Susan is leading the consultant team, providing oversight on the Refinement Plan strategy and development.
- **Nicholas Gross, Deputy Project Manager –** Nicholas supports Susan in the development of and coordination of the Refinement Plan.

JLA Public Involvement

Jessica Pickul, Public Involvement Lead – Jessica will oversee the public involvement plan and
engagement activities, including leading the in-person and online project open houses and managing
public comments.

STAKEHOLDER ADVISORY COMMITTEE

This project will include a Stakeholder Advisory Committee (SAC). The SAC will be comprised of community members who represent a variety of interests related to the trail. The SAC will provide input on trail opportunities, its alignment and outreach opportunities. They will review project deliverables and provide feedback. Each member should designate an alternative in case they are unable to attend meetings.

There will be four (4) SAC meetings for this project, which will be open to the public and include a public comment period.

TECHNICAL ADVISORY COMMITTEE

Technical Advisory Committee (TAC) will be comprised of staff from County, agency and jurisdictional representatives, service providers, as well as topical experts relevant to the project. The TAC will provide expert technical review of project deliverables, inter-jurisdictional coordination, and support community and stakeholder engagement.

ENGAGEMENT DURING THE COVID-19 CRISIS

The COVID-19 pandemic has rapidly changed the way many community members in Washington County work, live, and interact with each other. Washington County, ODOT, and the Consultant team understand that while project progress needs to continue, community safety is the top priority.

Gathering community input is central to the development of a refinement plan that is created and supported by the broad community. The current project scope outlines several engagement opportunities that require inperson public engagement which may need to be adjusted to enable community members to participate safely, yet meaningfully. Current state and federal guidelines prevent such a gathering for the foreseeable future.

The below table outlines engagement strategies that were scoped and alternative engagement ideas for the Project Management Team to consider as the project advances during the Coronavirus pandemic.

PUBLIC INVOLVEMENT STRATEGIES AND SCHEDULE

Tool/Activity	Description	Lead	Public Comment Analysis Lead
Public Engagement Plan (PIP)	The PIP outlines public involvement goals, activities and key messages for the project. The PIP will also include a demographic analysis of the project area and look at Title VI populations.	JLA	N/A
Stakeholder List and Comment Log	Consultant will develop and maintain a log of public and stakeholder contacts, involvement activities, participation, and major themes of input received.	Washington County	Washington County
Project Website	County will develop, host and maintain Project Website. Questions or comments that received through the website will be responded to by the County.	Washington County	Washington County
Project Factsheet	Consultant will design and develop a 1-page project factsheet with a project area map, schedule, key outcomes and opportunities for stakeholder involvement. The factsheet will be updated at each key milestone up to 3 times to provide relevant project information as well as website and contact information. Factsheet to be translated into Spanish on the back side and have information for requesting additional language translations.	JLA/ Centro Cultural	N/A
	COVID considerations: These may need to become newsletters that provide more information and info on ways to engage online.		

Tool/Activity	Description	Lead	Public Comment Analysis Lead
Open House Events	Consultant will host two (2) open house events. These events will be organized around the following major milestones:	JLA	JLA
	 Milestone 2: Alignment Alternatives Evaluation Milestone 3: Preferred Trail Alignment 		
	Spanish interpretation will be provided at both events. Washington County to provide advertising and interpretation in other languages. Meeting announcements will have information for requesting additional language translations.		
	COVID Considerations:		
	Overall, outreach with the public should be brief and more frequent.		
	These events may need to resemble more robust online events that include short video presentations, partnered with interactive activities to gather feedback online.		
	Paper packets of the materials could be created to provide the same information as the online event for those who an online event is not accessible. These packets could be advertised and made available for pick up at critical locations like grocery stores.		
	For those who are exercising outside, we could include signage along the corridor about what's being considered and encourage feedback through the online event.		

Tool/Activity	Description	Lead	Public Comment Analysis Lead
Online Events	Consultant will develop and run two (2) online events. Online outreach will be organized around the following major milestones:	JLA	JLA
	 Milestone 2: Alignment Alternatives Evaluation Milestone 3: Preferred Trail Alignment 		
	COVID Considerations: These events may need to be more robust and include brief informational videos that supplement what would have been discussed at the in-person events.		
Small-scale Community Events (2)	Consultant will arrange or participate in two small-scale community events in along the trail alignment. Consultant team will provide Spanish interpretation. Washington County to provide advertising and interpretation in additional languages.	KAI, with JLA and Centro Cultural each coordinating 1 event	JLA and Centro Cultural
	One event will be conducted in Spanish and hosted by Centro Cultural.		
	COVID Considerations: These events may turn into focus group meetings that occur online via tools like Zoom or Skype. It will be important to identify specific people to invite to these sessions.		

Tool/Activity	Description	Lead	Public Comment Analysis Lead
Stakeholder Meetings (up to 3)	County will arrange and conduct in-person meetings over the course of the Project, with technical staff or community stakeholders to support development, evaluation, and selection and refinement of alignment alternatives. PMT will identify the stakeholders and provide contact information to the County. COVID Considerations: These conversations could occur online via tools like Zoom or Skype.	Washington County	KAI
Stakeholder phone calls (up to 2)	County or ODOT will arrange and conduct up to 2 phone meetings over the course of the Project with technical staff or community key stakeholders to support development, evaluation, selection and refinement of alignment alternatives.	Washington County or ODOT	KAI

Tool/Activity	Description	Lead	Public Comment Analysis Lead
Stakeholder Advisory Committee (SAC)	The project team will consult a Stakeholder Advisory Committee on project considerations throughout the project. The SAC will meet 4 times. The first SAC meeting will include a tour of the project alignment options being considered.	JLA and Washington County	PMT
	The Consultant team will develop materials and facilitate each meeting.		
	The County will compose the membership of the SAC, advertise each meeting, reserve meeting spaces and prepare meeting notes for each meeting.		
	To make in-person meetings more accessible and to build awareness of the project, meetings will be streamed via Facebook Live on the County's account.		
	COVID Considerations: Meetings could occur online via tools like Zoom or MS Teams (hosted by the Consultant team) or Skype, however it should be considered whether stakeholders will be able to engage in meetings like these as there are many distractions and limitations on people's ability to focus. This could become an online group that includes the same members, enables brief conversations with the team, opportunities to weigh in and homework in between online discussions.		

Tool/Activity	Description	Lead	Public Comment Analysis Lead
Technical Advisory Committee (TAC)	The project team will consult a Technical Advisory Committee on project considerations throughout the project. The TAC will meet 4 times. The first TAC meeting will include a tour of the project alignment options being considered.	KAI and Washington County	PMT
	The Consultant team will develop materials and facilitate each meeting.		
	The County will compose the membership of the TAC, advertise each meeting, reserve meeting spaces and prepare meeting notes for each meeting.		
	COVID Considerations: These meetings could occur online via tools like Zoom or Skype however it should be considered whether this project fits in with other agency priorities at this time.		
Public Engagement Synthesis Report	Consultant will prepare a Public Engagement Synthesis Report summarizing outreach activities, input received, and how the input was used and responded to.	JLA	JLA

COMMUNITY EVENTS

Hosting an information table at local community events is an effective way to reach a wide variety of community members. The following events may be considered for the two small-scale community events:

- Aloha-Reedsville Farmers Market
- Beaverton Farmers Market
- Beaverton Night Market
- Hillsboro Farmers Market
- Hillsboro Tuesday Night Market
- Hillsboro Latino Cultural Festival
- El Grito Community Festival
- Washington County Fair

Note: With the COVID-19 crisis, these events may be canceled. If needed, the project team will provide alternative community input opportunities during the pandemic.

ANTICIPATED SCHEDULE (As of May 2020)

TASKS & PUBLIC INVOLVEMENT				
		EXISTING CONDITIONS	March 2020 - June 2020	
	i	Project Team Kick-off Meeting	March 2020	
	iėi	Stakeholder Advisory Committee #1	June 2020	
		TRAIL ALIGNMENT ALTERNATIVE EVALUATION	June 2020 – Seplember 2020	
	₽	Online Outreach #1	June - July 2020	
	•	Stakeholder Outreach	August 2020	
	i	Community Events #1 & #2	August - September 2020	
	iÀi	Study Area Tour of Preferred Trail Alignments	September 2020	
	iÀi	Stakeholder Advisory Committee #2	September 2020	
		Online Outreach #2	August - September 2020	
		PREFERRED ALIGNMENT & CONCEPTUAL DESIGN	October – December 2020	
	iÀi	Community Events #3 & #4	November - December 2020	
	i	Stakeholder Advisory Committee #3	November 2020	
		DRAFT AND FINAL TV TRAIL REFINEMENT PLAN	December 2020 - March 2021	
	iėi	Stakeholder Advisory Committee #4	February 2021	

MEASUREMENTS AND MONITORING OUTREACH ACTIVITIES

The project team will evaluate the public involvement process on an ongoing basis to determine the effectiveness of the outreach effort.

At key milestones, the project team will assess how well the program is meeting the public involvement goals listed in this plan. While evaluation of these goals is necessarily subjective, the team will also consider the following more measurable objectives as the team assesses program effectiveness:

- Number of participants attending meetings or events.
- Number of website hits or downloads occurring during a specific time period.
- Number of people who have signed up for the project mailing list.
- Number of project comments received (phone, email, comment cards, online).
- Whether the comments are relevant to the project (indicates project understanding).
- How project decisions have been modified as a result of public input.





A TRAIL TO CONNECT BEAVERTON, ALOHA AND HILLSBORO

Washington County is moving forward with plans for the Tualatin Valley Trail, which will run parallel to TV Highway (Oregon 8).

This trail will eventually connect Beaverton, Aloha and Hillsboro for biking, walking and more—whether for fun and fitness or for getting to work, running errands, or catching a bus or MAX train.

It will also be an important part of the future Turf-to-Surf Trail, which will connect the Portland region with the Oregon Coast.



A REGIONAL TRAIL FOR ALL

We want to provide safe and comfortable choices for traveling the TV Highway corridor and increase access to physical activity. The Tualatin Valley Trail will be a low-stress way to commute, recreate, or travel through by biking, walking and more. We also hope this trail will:

- Provide much-needed transportation options for people in an underserved area.
- Create an opportunity for trail users to stop at local businesses.
- Help TV Highway feel safer and less congested for those driving.

The project will pick up from previous planning efforts and will focus on the trail route and other details. It will help the county and others decide how best to build and maintain the Tualatin Valley Trail, including through partnerships with other local governments and with businesses.



HELP US GET ROLLING ON THE PLAN!

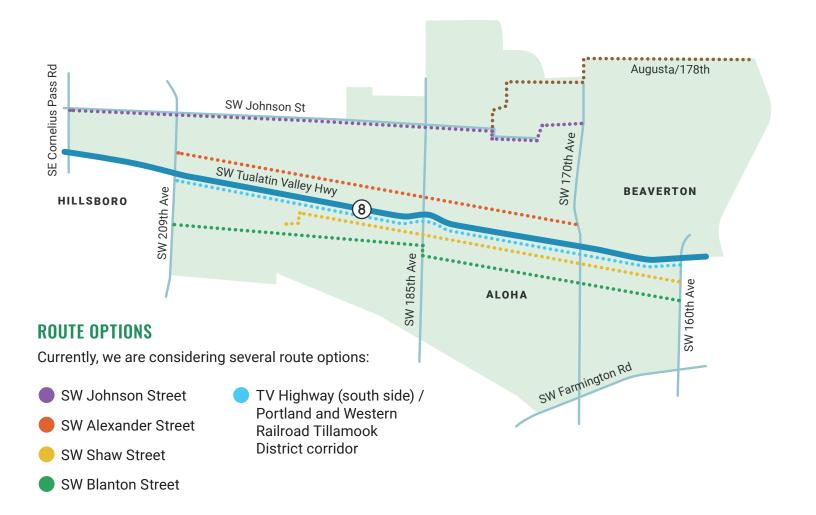
We envision a trail that's inviting to everyone—so we need everyone's input on:

- Which route offers the best experience (access to nature, least amount of exposure to traffic, most connections to community destinations, etc.).
- · What features the trail should include.
- How to get it built.

With the Coronavirus pandemic in mind, we plan to offer a variety of safe and healthy opportunities to provide input. Visit www.WebsitePlaceholder.com to learn more and sign up for project updates.

LEARN MORE AND GET INVOLVED!
www.WebsitePlaceholder.com

PROJECT AREA MAP





WHAT'S IN A CONCEPT PLAN?

The Concept Plan will help define what to build, including:

- · Which street the trail will be on.
- How we want the trail to look, and what features we need.
- · How much it will cost to build, and also to own and maintain.
- Which parts we'll build soonest, and how much we'll build each year.

Once this current work is completed, the County, partners and/or project champions can take the next steps work on securing funding to design and construct the trail.

LEARN MORE AND GET INVOLVED! www.WebsitePlaceholder.com

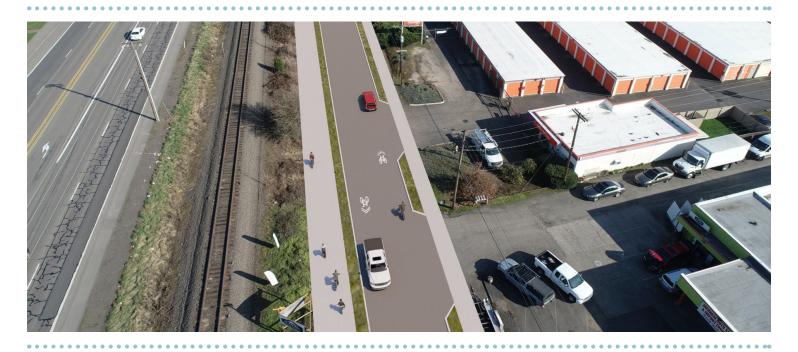
STAY IN TOUCH Dyami Valentine Washington County Planner
503-846-3821 | dyami_valentine@co.washington.or.us





THE TUALATIN VALLEY TRAIL CONCEPT PLAN

The idea of a Tualatin Valley (TV) Trail has been a topic of community discussions for decades. Envisioned as an important link between Beaverton, Aloha, and Hillsboro, the trail would also be a key part of a network of low-stress, safe trails connecting the greater Portland region with the Oregon Coast.



CONCEPT PLAN OVERVIEW

The Concept Plan shares the results of a study to select a preferred trail alignment that will meet the connectivity, safety, access, and mobility needs for people walking, biking, and rolling through Washington County.

Accessible for all ages and abilities, the TV Trail Concept Plan was developed keeping the end user in mind by creating low-stress and comfortable facilities through the use of separated sidewalks, bike lanes, and shareduse paths.

The TV Trail will be a low-stress experience to commute, recreate, or travel on, accessible for all ages and abilities. It's time to make the TV Trail a reality!



READ THE TV TRAIL CONCEPT PLAN! www.URLforconceptplan.com

THE TV TRAIL CONCEPT PLAN PRESENTS SAFE, COMFORTABLE, AND LOW-STRESS OPTIONS FOR TRAVELING THE TV HIGHWAY CORRIDOR, INCREASING ACCESS TO PHYSICAL ACTIVITY AND ESSENTIAL DESTINATIONS.

PRIORITIZING LOCAL NEFDS

Balancing the needs of the regional trail connection with the needs of the local community is an important component to the TV Trail Concept Plan.



DESIGNING FOR A LOW STRESS EXPERIENCE

A regional trail experience must be safe, comfortable, and low stress for all users. For people biking, the TV Trail Concept Plan targets the "Interested but Concerned" population by providing physically separated bike lanes (SW Blanton Street) or a physically separated shared-use path (SW Shaw Street).

For people walking and rolling, the TV Trail Concept Plan provides physically separated sidewalks with land-scape buffers (SW Blanton Street), a physically separated shared-use path (SW Shaw Street), and context-sensitive pedestrian scale lighting. Existing pedestrian ramps will be improved to comply with the Americans with Disabilities Act (ADA).

THE TV TRAIL CONCEPT PLAN DESCRIBES THE PLANNING PROCESS AND ULTIMATE SELECTION OF TWO PREFERRED ALIGNMENT ALTERNATIVES FOR THE TV TRAIL:



READ THE TV TRAIL CONCEPT PLAN! www.URLforconceptplan.com

STAY IN TOUCH Dyami Valentine Washington County Planner 503-846-3821 | dyami_valentine@co.washington.or.us



Washington County, 155 N. First Avenue, Suite: 350 Hillsboro, OR 97124

Learn about the Tualatin Valley Trail and help us determine which route is the best for Aloha.

Go to **bit.ly/TVTrail** to participate in the online open house Nov. 16 – Dec. 11

Aprenda sobre el sendero del valle de Tualatin y ayúdenos a determinar qué ruta es la mejor para Aloha.

Vaya a **bit.ly/TVTrail** para participar en la jornada de puertas abiertas en línea 16 de nov. – 11 de dic.



Help us decide where to put Aloha's next regional trail! ¡Ayúdanos decidir dónde poner la próxima ruta regional!





Tell us what you think!

Between Nov. 16 – Dec. 11.

¡Díganos lo que piensa!

Entre 16 de nov. – 11 de dic.

Washington County is considering three routes for a new regional trail that will connect Aloha to neighboring communities. El condado de Washington está considerando tres rutas para un nuevo sendero regional que conectará Aloha con las comunidades vecinas.



Washington County, 155 N. First Avenue, Suite: 350 Hillsboro, OR 97124

Help us finalize the TV Trail Concept Plan!

Go to **bit.ly/TVTrail** to participate in the online open house May 20 – June 2

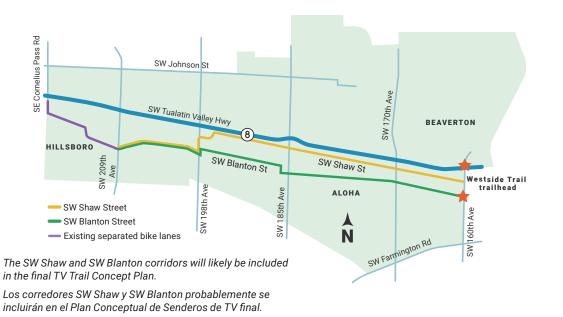
¡Ayúdanos a finalizar el plan conceptual de TV Trail!

Vaya a **bit.ly/TVTrail** para participar en la jornada de puertas abiertas en línea 20 de mayo – 2 de junio



We have two corridors for the TV Trail and need your input! ¡Tenemos dos pasillos para TV Trail y necesitamos su opinión!





Tell us what you think.

Participate in the online open house May 20 to June 2.

Díganos lo que piensa.

Participe en la jornada de puertas abiertas en línea del 20 de mayo al 2 de junio.

bit.ly/TVTrail

We'll be tabling at parks along the corridors on May 20th where you can talk with the team about the project. Details at **bit.ly/TVTrail**.

Estaremos en los parques a lo largo de los pasillos el 20 de mayo, donde podrá hablar con el equipo sobre el proyecto. Detalles en **bit.ly/TVTrail**.

Tualatin Valley Trail Refinement Plan

Winter 2020 Online Open House Summary



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Updated January 2021

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Introduction

Washington County and ODOT conducted an online open house between November 13 and December 11, 2020 to solicit feedback from the community to evaluate alignment alternatives for the Tualatin Valley (TV) Trail. Feedback received through this outreach period will be considered as Washington County identifies the preferred trail alignment for TV Trail.

Overall Participation and Notification

To gather feedback on the alternative alignments, the project team developed an **online open house** that included a **destinations map.** Participants were able to identify places on the map they would travel to using TV Trail, if it existed.

Two language options were made available for the online open house: English and Spanish. Overall, **386 people participated** in English-language version and one person submitted their feedback using the Spanish-language version.

Community members were informed about the online open house through the following:

- Social media posts to the Washington County Facebook page, Twitter, and Nextdoor
- Posts on the county project website
- Media release
- County newsletters (sent via email)
- Mailed postcards

Feedback Summary

Open House Questions and Destinations Map

This section summarizes the feedback received through the online open house and destination map included in the open house.

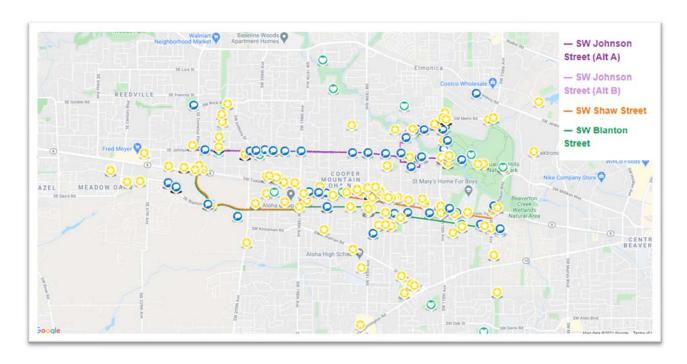
Destinations Map

Participants in the online open house were given the opportunity provide feedback on places that TV Trail would help them get to, if it existed. **81 unique users** submitted a total of **243 destination comments**. On average, each user submitted a total of 3 destination comments. These comments are summarized below.

Please see <u>Appendix B</u> for more details about the comments as well as the specific addresses of the locations or places participants submitted comments about. Respondents were given the choice of three icons:

- (star) to denote a place
- (comment bubble) to denote a comment

(heart) to denote something they liked



Commercial and Community Destinations

More than a third (36%) of the comments focused on commercial and community destinations (like schools or libraries). The following is a summary of the most mentioned commercial and community destinations:

Commercial and Retail

- Rainy Day Games was mentioned five times
- o Produce stand at SW 185th Ave was mentioned four times
- Aloha Food Carts mentioned three times
- Two Ace Hardware locations were noted
- o Portland Clinic in Beaverton was mentioned twice
- Safeway at 20535 SW Tualatin Valley Hwy
- Other: Users noted that many businesses will be built at Cornelius Pass Rd and SW Blanton

Employment

- o Intel
- Nike
- OHSU West Campus

• Community Services and Destinations

- o Aloha High School
- Beaver Acres
- International School of Beaverton
- Kinnaman Elementary

- Ladd Acres Elementary
- o Reedville Elementary School
- Post offices and libraries throughout the area

Parks and Recreation Destinations

About **a quarter of the comments** focused on parks and recreation. The following is a summary of the most mentioned parks and recreation locations:

- Parks and open spaces were mentioned over 40 times. In addition to Tualatin Hills
 Nature Park, which was mentioned the most, Barsotti Park and Arnold Park were
 mentioned a few times, as well as several other parks
- **Trails:** Several trails were mentioned, including the Powerline Trail, Rock Creek Trail, and Westside Trail

Streets and Intersections

About a quarter of all comments related to the alternative alignments and specific areas on the streets and intersections that respondents had concerns or ideas about. The following is a summary of the most mentioned streets and intersections:

Streets and Intersections

- Many respondents noted intersections and streets where pedestrian bridges and/or tunnels would increase safety and connectivity. This feedback was mirrored throughout the online open house.
- SW 170th Ave: Add bike lanes, intersection at SW Shaw needs a pedestrian/bike tunnel
- SW 185th Ave: Safety was a main concern along this road, specifically for the SW Shaw and SW Blanton alignments, intersection at SW Shaw or Blanton needs a pedestrian/bike tunnel, intersection at SW Johnson is the best crossing.
- Augusta Ln: Opportunity to connect to the nature park at 170th and use the pedestrian bridge being proposed at the creek crossing for TV Trail (which many participants noted).
- o **TV Highway:** Intersections at 170th and 185th are unsafe.

• Alternative Alignments:

- SW Shaw and SW Blanton: Both in areas zoned for more development, presenting future hazards and automotive traffic which will affect safety.
- o SW Blanton:
 - Run the trail along SW 184th Ave rather than SW 185th Ave
 - Need signalized crossing at 185th
 - Termination point: Ending at SW 160th Ave could provide more connections; suggestion to extend the trail to Century
 - From SW 170th Ave to SW 185th Ave this is a very narrow road
 - Sidewalk needed
 - Needs improved connection to Powerline Trail
- SW Shaw:

- Address the "ugliest" parts of SW Shaw by doing a hybrid between Blanton east of 173rd and Shaw to the West, using 173rd to cross between the two
- One participant preferred Shaw over Blanton for safety concerns
- This is a low traffic option and is close to TV Hwy
- Needs improved connection to Powerline Trail

SW Johnson:

- Route Alt. B to the south at Augusta Ln and Chatelain to connect to the Nature Park
- Johnson lacks a sidewalk, bike lane, and parking strip. It is a very narrow street and would need to be widened (which some participants were in favor and against).
- Concerns about parking along the street
- Has a lot of traffic already as people use it to bypass TV Hwy
- SW Johnson is a very dangerous road for bikes and pedestrians

Public Transit Destinations

• The following **public transit stops** were noted on the map: MaxPlus, Max & Waterline, Merlo Max, Beaverton Creek, 158th/Nature Park

Other Noted Destinations and Comments

- New homes being built in South Hillsboro
- Concerns about safety at Cornelius Pass
- Frequent truck traffic and many businesses along SW Shaw between SW 188th and 196th Avenues raises the potential for conflicts between people on bikes and in trucks
- Traffic at SW 188th and SW Blanton is a concern, especially with bad lighting

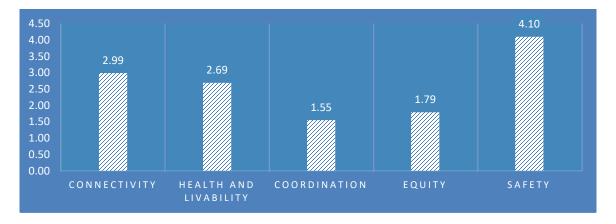
Online Open House Responses

Participants from the online open house were given the opportunity to respond to a series of questions to review and give feedback on the alternative alignments being considered for TV Trail. Feedback is summarized below.

1. The project goals are listed below. How would you rank them in order of importance? (Where 5 is "most important" and 1 is "least important.")

The project goals of Safety, Connectivity, Health and Livability, Coordination, and Equity were listed. Participants were informed that while "Feasibility" is also one of the project goals, it was not included in this goal ranking exercise as only feasible options will be carried forward. The feasibility goal and evaluation criteria are being used to develop the concepts and balance impacts and costs with the other project goals.

Overall, **Safety was ranked highest** with a weighted average of 4.10 and **Coordination** was ranked the lowest with a weighted average of 1.55.



2. SW Johnson Street Corridor: Are there things you think we should consider about this corridor?

Key themes are noted below. Review all individual comments in Appendix A.

Safety:

- There were conflicting comments about the safety of this option, some felt it
 was the quieter and safer option while others felt that it was not due to current
 traffic congestion, lack of sidewalks, etc.
- Concern about sharing the road with bicyclists
- Concern over increased speeds on Johnson (which TV Trail might help with).
 Speed bumps would need to be installed.
- Many respondents commented on how **narrow** Johnson is and that it would need to be widened
- Many liked that it is not near TV Hwy
- o Alt B would make the north section of SW 175th Ave safer
- Least amount of "complicated intersections"

Traffic

 Conflicting feedback related to traffic, including concerns that putting TV Trail here could exacerbate or improve traffic on an already congested street

Driveways and Private Property:

- Many driveways on this street
- Many noted that this street feels residential and there was concern about how putting TV Trail here would impact the people living there

• Sidewalks and street improvements:

- Many students use Johnson as a route to school
- Many noted that this street would benefit from upgrades like sidewalks, more lighting, and bike lanes

Connectivity:

- Connects to existing trail and nature
- Connects to more family homes
- Mixed comments related to how well this corridor connects to community destinations, commercial areas, and public transit.

 Concerns about the **termination points** of the trail and how they connect out to the rest of the community

Other:

- Some felt that this was the most "enjoyable" and "pleasant" option
- Respondents did not want the trees to be removed on this street or wildlife to be impacted
- One participant commented that this option seems to have the least amount of "big obstacles"
- Distance from TV Highway will likely decrease its use
- Some respondents noted that this looks like the most direct route

3. SW Shaw Street Corridor: Are there things you think we should consider about this corridor?

Key themes are noted below. Review all individual comments in Appendix A.

Safety:

- Major street crossings (160th, 170th and 185th) were common concerns.
 Respondent noted there would need to be better traffic controls at intersections
- Safety concerns around the railroad crossing, aggressive drivers, and street lighting
- Needs dedicated and protected bike/pedestrian infrastructure
- o **Left turns** for bikes are a concern and should be avoided
- Speeding was a concern for many
- Some respondents mentioned that this alignment is **not ideal for bicyclists** partly because it is close to TV Highway

Traffic

- o Street is **very narrow and congested** in some areas such as 185th intersection
- There were conflicting comments about traffic congestion being good and bad on SW Shaw

• Connectivity:

- Continuity with other trails like the Westside Trail
- Railroad negatively impacts connectivity and cut off the southern area of the community from the north
- Good connectivity with businesses and commercial areas
- Public Transit: Close to major bus stops but questions/concerns about access to MAX stops
- Putting the trail here would provide a direct route from downtown Hillsboro area to downtown Beaverton

Proximity to TV Highway

- Many concerns about noise, air quality, and difficulty crossing arterials near existing major intersections, traffic, etc.; however, it would provide access to a lot of destinations, especially businesses
- o **Crossing** of TV Hwy is a concern
- Running the trail along TV Hwy and railroad may increase property value

Other:

- While many noted that the "scenery" of this area is uninviting or that it was not an attractive area, some noted that putting TV Trail here would improve the area
- Concerns about being so close to Intel
- Least amount of residential and commercial driveways

4. SW Blanton Street Corridor: Are there things you think we should consider about this corridor?

Key themes are noted below. Review all individual comments in Appendix A.

Safety:

- Crossing the major intersections (185th, 198th, 209th) would be difficult unless there are bike/pedestrian tunnel
- o Street lighting is a concern
- Signalized crossing at 170th is an advantage to SW Shaw
- Concerns with how drivers and bicyclists will interact on this route
- Some noted that there needs to be sufficient safe access to the north side of TV highway (via a pedestrian bridge, etc.)
- There is some perception that this is a dangerous area; however, TV Trail would improve the safety of the area
- o Some cyclists noted that they felt this is the safest route
- o Speeding and aggressive driving along this road would need to be addressed

• Traffic and Congestion

- Less traffic east of 209th
- o Many drivers cut through this route to 170th from 185th
- o Common route for school buses
- Similar traffic problems to Shaw
- Possible conflicts with railroad crossings

Driveways, Private Property and Trees:

- Some noted that there are too many driveways and homes and TV Trail would disrupt the neighborhood
- A lot of trees that may need to be cut down, which could change the character of the neighborhood (specifically Alt. B)
- o The street would need to be widened if used as TV Trail
- Potential conflict with parking along the rowhouses

• Sidewalks and street improvements:

- Someone commented about the jog at 185th being challenging and needing to be fixed
- This route needs sidewalks or a soft surface section with dirt or gravel for walkers and runners

• Connectivity:

 Good connectivity to parks and trails, the MAX line, new South Hillsboro development, existing bike lanes near Cornelius Pass, and schools

- Conflicting comments about sufficient connections to business along this route some said there were businesses along this route and others noted that it was too far from businesses.
- Would be better if it connected to a grocery store
- Furthest away from population density to the north of TV Highway; however, it will serve growing population in Reed's Crossing and South Hillsboro

Proximity to TV Highway

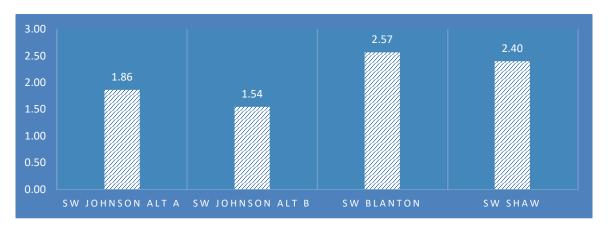
- o Like that it is farther away than SW Shaw but closer than SW Johnson
- Still some concern about it being close to TV Highway; but overall, participants thought it was a good distance

Other:

- This alignment had the most positive comments than the other two. Many noted that this option will help improve the area, which balanced out the negative aspects of this route (intersections, safety, etc.)
- Some commented that this is the most scenic route
- One participant noted that, according to the Ride with GPS Heatmap, this is the most travelled route of the options

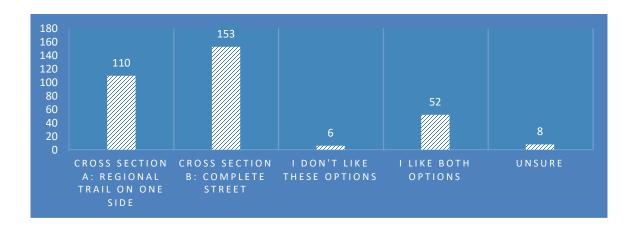
5. Which corridor do you think would be the best fit for the TV Trail? (Where 4 is "best fit" and 1 is "worst fit.")

Overall, participants ranked **SW Blanton as the best fit** for TV Trail and SW Johnson Alternative B the worst fit.



6. Which of these cross sections do you think will be the most welcoming for all trail users?

Of the two cross sections presented to participants, **almost half (47%) of respondents preferred the "Complete Street" cross section**, while about a third of respondents preferred the cross section with the regional trail on one side. A minority of respondents said they didn't like either option.

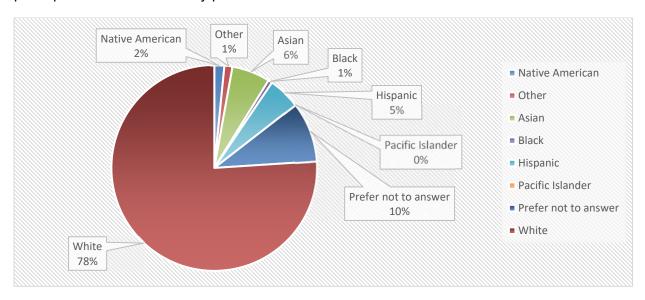


Demographic Information

Participants from the online open house were asked a series of optional demographic questions. This information is useful to compare with the city's current demographics.

Racial or Ethnic Identity

The majority of participants identify as white (78%), slightly lower than the percent of Washington County population that identifies as white (82%). The second largest group of participants selected that they preferred not to answer.

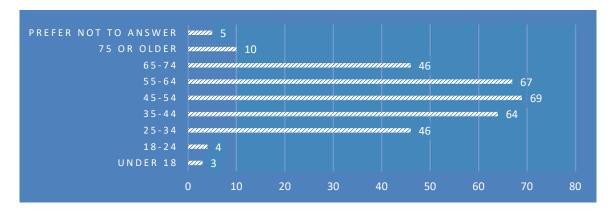


Language (other than English)

Participants were asked if they spoke a language other than English at home. **The majority of respondents (92%) speak primarily English at home.** Seven responded that they speak Spanish and two responded that they speak Vietnamese. Answers that were submitted by only one participant each included: Japanese, Mandarin, French, Kannada, and Marathi.

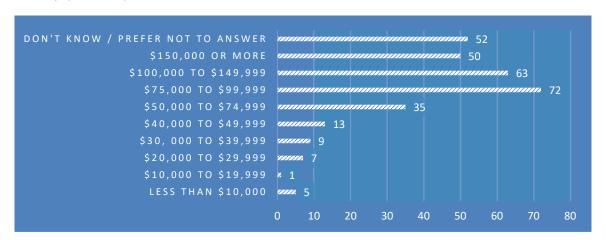
Age

Overall, the age of participants was higher than the median age of community members in Washington County (36 years old). Of those that responded, the largest group of participants are between the ages of 45 – 54 (22%). The second largest group of participants are between the ages of 55 – 64 (21%).



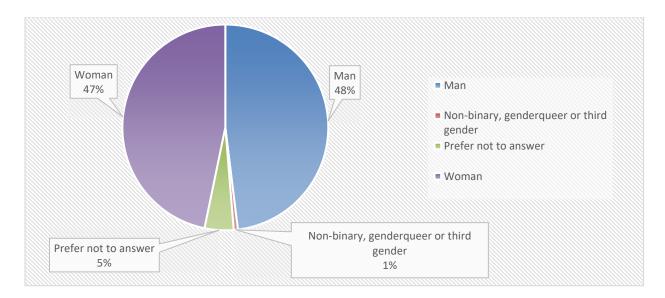
Annual Household Income Before Taxes

The majority of the online survey participants have a household income between \$75,000 to \$99,999 a year, which was slightly higher than the median household income in Washington County (\$74,033).



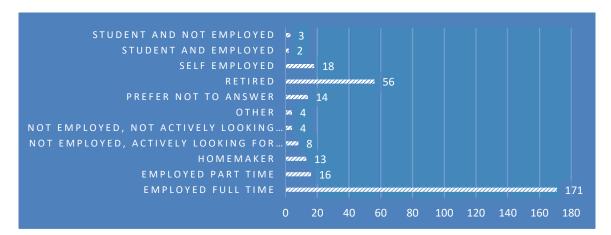
Gender

Participants were **almost equally split between men (48%) and women (47%)** with 5% of respondents preferring not to answer and 1% indicating they identified as non-binary, genderqueer, or third gender.



Employment Status

Over half (55%) of all respondents are employed full time, while 18% are retired. A few of the respondents who responded as "Other" indicated they were unemployed temporarily due to COVID-19.



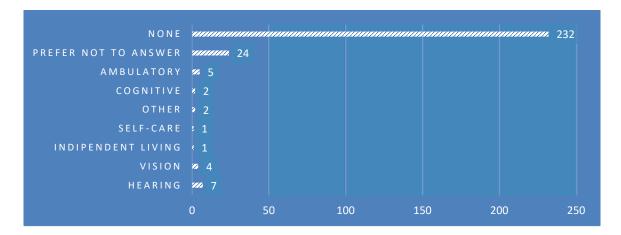
Zip Code of Primary Residence, Employment, and School

The most common zip codes are listed below. More detailed information can be found in Appendix C.

- Primary Residence: 97003, 97078, 97007, 97123, 97006, 97124
- **Employment:** 97124, 97123, 97003, 97005, 97006
- **School:** Only 41 participants identified a school zip code, of those, 97003 and 97007 were the most common

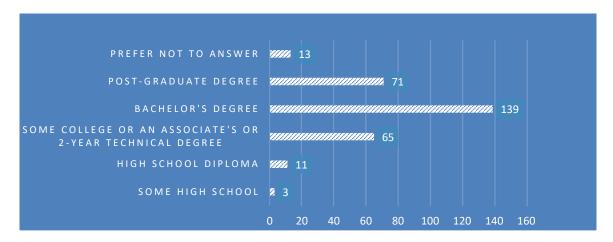
Disability

The majority of respondents (92%) indicated they had no disabilities or preferred not to answer. The most common disability indicated was ambulatory (2%).



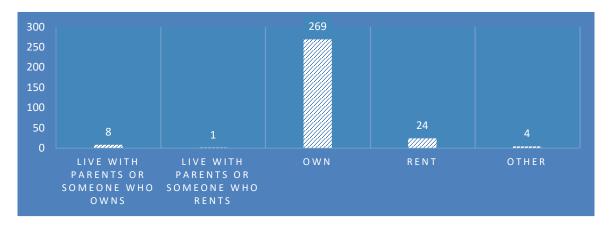
Education

A little less than **half of all respondents (46%) have a Bachelor's degree**, with about a quarter (23%) having a post-graduate degree, and 20% having some college, an associate's, or a 2-year technical degree.



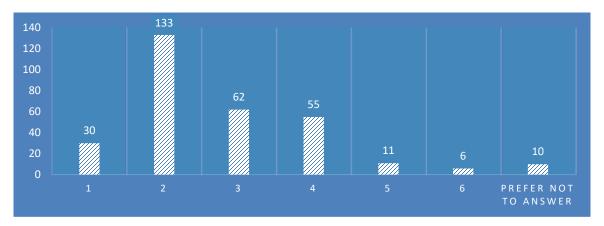
Rent or Own

The **majority of respondents (88%) own** their home, while **8% rent**. A few (3%) of respondents live with parents or family.



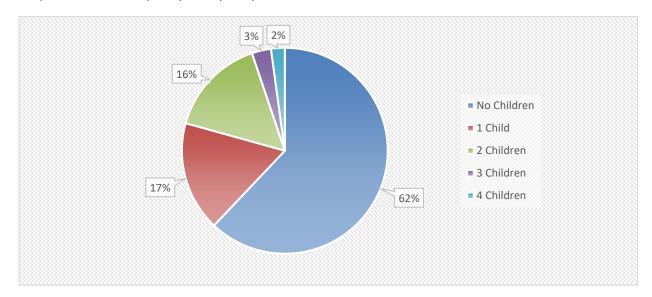
People in Household

The majority of respondents had two or more people living in their home (87%), with a little less than half of all respondents having 2 people living in their home (43%). 10% of all respondents lived alone.



Children under the Age of 18 in Household

Over half (62%) of all respondents had no children in their homes. A little over a third of all respondents had 1 (17%) or 2 (16%) children in their home.



Access to a Vehicle

The overwhelming majority (94%) of respondents indicated that they have access to a vehicle. 5% of respondents did not have access to a vehicle or sometimes have access to a vehicle.

Appendix A: Online Open House Open Text Questions

Below are the comments respondents submitted for the open text questions in the open house.

Question 2: SW Johnson Street Corridor: Are there things you think we should consider about this corridor?

- How close and accessible is the Max line from this trail?
- There's a ton of driveways and there's a moderate amount of vehicular traffic on this road that would have to share space with bikes.
- I think Johnson is in great need of an upgrade. Many students of all ages use Johnson
 as a route to school. Having a designated sidewalk & bike lane would great improve the
 safety of this road.
- Maybe make a gravel/dirt side road on the sid.
- whatever treatment is chosen should continue west of Cornelius Pass in Hillsboro. Lots
 of bicyclist use Johnson now as a good route.
- looks like the most direct route
- I live near Johnson St and it would be the most accessible for my family. We love the idea of a trail that leads to the ocean! Would the trail be on/next to the road itself or sectioned off in a way that feels more secure for bicyclists and pedestrians?
- Consider having a soft surface such as dirt or fine gravel for runners and walkers in addition to a paved section for bikes
- school bus stops 9 months of the year, homes property close to the road, no sidewalks
- Concern over increased speeds on Johnson. This trail might help mitigate that
- Paved and lit sidewalks are a must.
- If you continue west on Johnson you reach Fred Meyer. It also has traffic lights for safe crossing at Corn Pass Rd.,198th, and 185th.
- Too many homes right on path and will all see huge traffic changes... not good!
- its connection to the residential community connected by commercial on both ends
- its connection to the residential community connected by commercial on both ends
- Johnson is already too narrow for two cars passing in areas. We don't think it is a safe option for anyone.
- widen Johnson.
- Seems very residential
- like because not close to TV HWY and can use existing traffic signals
- Most direct route with safest crossing of dangerous intersections. Looking forward to the planned pedestrian bridge.
- Don't like this route at all
- This route is not conducive to non-motorized travel.
- Maybe the least bad of the options. Street is narrow and would need to be widened to add bike lanes safely.
- Connects to existing trail. Offers more nature. Connects to more family homes.

- I especially like that the Johnson option could eventually connect to Powerlines/Paula Jean park if that gets expanded in the future. I also like that this option is a little more removed from TV highway, and is on the same side as the Nature park.
- Alt B would mean making the north section of 175th safer, that would be good
- Doesn't seem as conducive to connecting with transit options
- 170th is dangerous to bike on. Johnson street is great.
- A lot of homes, driveways and no sidewalks already there. Would definitely take away from homeowner's property.
- Consistency in the bike facility. I saw no lanes, sharrows, lanes, and protected lanes.
 How can the project make changes to signal to people driving cars that this is a major bike corridor. For people walking, there are sidewalks needed.
- Can you add bike lanes or walking path off the road.
- Including side walks and street lights
- Sidewalks and streetlights.
- Farther from commercial and employment destinations.
- Route between 185th and 170th is not direct
- only option that goes to a grocery store (Fred Meyer West of Cornelius Pass Rd)
- Perhaps being further from TV Hwy would be better for the health of those using the trail as there would be less air pollution.
- Not very well lit, sometimes busy I would be concerned that it isn't very protected
- Put in poop bags and trash cans
- Always see a lot of people walking and riding bicycles. Seems to connect to more activities, businesses, schools, etc than other routes.
- I think it is needed on Johnson. As a runner, I struggle to find safe places in this area or a safe route for my family to bike ride.
- This route appears to provide the fewest options for connecting.
- Where is the reedville trail? The challenge the trails is they don't continue to connect to
 others. I ride Johnson to 170th through the park then to the westside trail. It would be
 good to see that connection and one to brookwood at least on the westide. Crossing
 Cornelius pass is difficult, a connection to the rockcreek trail would also be nice along
 the powerlines.
- Does not seem to be a lot of area to ride outside of a car's lane...
- There is too much traffic on Johnson already. It is difficult just to cross the street. PLEASE don't add to this problem!
- This is one of the ""main"" stretches through Aloha that does not have sidewalks. Many pedestrians, dog walkers, and bicyclist use this daily despite the risk. There needs to be a safe main thoroughfare through this neighborhood connecting 185th and Cornelius Pass. I like this trail for the reason that it is further from TV highway. This neighborhood needs it. Shaw street is already a relatively safe area (low traffic). Also, any trails along shaw will be next to the train tracks and a four lane highway.
- This is probably the best option for enjoyment of the route and the ability to link together nice parks and existing trails. East and west end terminations seem a bit problematic.

- Would provide a connection to the Nature Park and is reachable from the MAX. I've biked this road and consider it to be much calmer than the other options
- Dedicated/Protected bike/pedestrian infrastructure should be a consideration, along with Auto traffic calming measures (speed bumps, signs, etc.)
- Number of stop signs/lights and cut through traffic. I already ride Johnson a lot west bound and it is a popular cut through over TV highway and Alexander
- Impacts to the residential neighborhood.
- Please do not build more buffered bike lanes on this corridor, and consider traffic
 calming solutions to encourage motorists to share the road. Buffered bike lanes and
 extra road width can make the roadway more unsafe by encouraging excess speeds.
- Good connectivity with the TV Nature Park. Some safety concerns regarding width of street and traffic. Crossing at 170th a safety concern.
- The Johnson St corridor should by all means be improved to create a nice parallel route to TV Highway, but it should not be considered an alternative to TV Highway due to its distance from TV Highway.
- How intense the vehicle traffic is on Johnson, getting heavier. Side note, simple sidewalks would be a good idea for Johnson since many people walk, bike in traffic.
- I like this option because it is wider and would allow for the proposals
- It appears to be most direct (Alt. A)
- It ends on 170th which doesn't have bike lanes or sidewalks in this area. Dead ends at the nature park
- Distance away from TV Highway. Many driveway crossings.
- I live on the opposite side of TV Hwy, however, we would probably go across the road to use this trail. With the new trails in Reeds Crossing, we are often along Blanton, though, and crossing over to Johnson is less appealing.
- Lots of lovely trees on this route. THEY MUST NOT BE REMOVED!!!
- I like the idea that it's farther from TV HWY (less pollution, noise?).
- To be useful, the video should be shown at the speed you would ride your bike.
- lack of space for sidewalks, bike lanes?
- nice route, too much residential traffic, and intact to homeowners
- Johnson St provides the most safety as far as biking and walking. There aren't so many cars that use this road compared to the other options.
- Please don't cut through the areas with the creek and wildlife
- How will it effect the people living there
- Closer to the majority of business, so users wouldn't have to cross TV highway, but much further from the highway itself.
- It has less drive ways, better and safer crossings of intersections, and is quieter and safer.
- This is farther from TV Highway's noise and exhaust pollution. Cleaner air is important for active people.
- Lack of sidewalks in many sectors
- Wet areas frosty trail lots driveways.

- This is the option that provides the most health and livability further away from the noise and pollution of traffic.
- I think we should consider the Johnson route being that aloha Beaverton and Hillsboro can use an upgrade in their neighborhood north of Tv HighwayAlso South Hillsboro has received quite a bit of infrastructure already
- on street vehicles that could block sight distance; ease of crossing major arterials;
 vehicle speed along the corridor
- North of T.V. Hwy., it doesn't feel real safe to navigate 185th by bike, so we get off it as soon as possible (usually on Johnson). South of T.V. highway is already slower paced and not as precarious.
- This option seems safest, and there is a lot of greenery and shade which will add appeal
 and enjoyment for trail users. Additional safety features like physical barriers between
 lanes for cars, bikes and pedestrians would be great for this and all other options. Also
 additional safety features for intersections would be good; I'm not sure what the options
 are for this.
- postive- There is already a paved path from Cornelius Pass to 209th. negative- narrow streets, school crossing
- I like this option as second best to Shaw St option
- Residential only. No access to any business
- Safety
- Johnson St is primary used for vehicle traffic trying to avoid TV hwy traffic and stop lights. Cars tend to zip through the neighborhood, speed bumps should be installed to slow traffic down if this is chosen.
- To many residential driveways too dangerous
- Johnson best connects with other trails, especially on the east terminus.
- Johnson is way too narrow for a safe trail. Construction would disrupt too many neighborhoods.
- I've never walked or biked on Johnson St. No sidewalks that I remember from my drives down the street.
- The corridor needs to be practical as well as recreational. Think about someone shopping, doing errands, going to the laundromat (remember that a decent bike trailer is only \$300 or so, far less \$ than a car). People on bikes need safe access to the businesses along TV Highway.
- This is a good candidate for a neighborhood green street, but it's not as close to major commercial destinations and transit connections along TV Hwy. As a cyclist, I would use this if I lived in the neighborhoods north of TV Hwy, but for regional connections, it feels out of direction.
- I like that the SW Johnson trail goes to 170th not too far south from a max stop.
- Provides a safe route for the kid to get to school and see their friends. Will make the area more desirable for younger families as well.
- Right now these neighborhoods have very low through traffic. This would greatly increase that which would be a big negative

- Doesn't feel like a ""safe"" option: too many interactions with driveways and motorized vehicles!
- Has least complicated intersections for bike navigation, but fairly busy street.
- If on this road there would need to be some sort of traffic control on 170th to Nature Park.
- Johnson is a much more pleasant path than the others. Less density, therefore, less vehicles and it's safer for children.
- Positive: It is on the same side of the RR tracks as TV Hwy and many businesses.
 Negative: Some parts are narrow without sidewalks and hazards (deep swales, thorny bushes) right up to the vehicle lanes.
- Why would people use this corridor? What are the connections or destinations that would encourage use?
- There doesn't seem to be enough space for bicycle and pedestrian traffic on the road. Are there going to be sidewalks and bike lanes installed? Johnson already seems really tight through most of that area and I can't imagine how there could be enough buffer space between cars and bikes/pedestrians. Also, this route seems a little too far north.
- It would be wonderful to have it be on Johnson, It is such a terrible road for walking or anyone other than cars. This would dramatically improve safety. Think the shared road would be the best option so it doesn't take as much from the existing property owners.
- Johnson St Alt B: with the county's upcoming pedestrian bridge over Beaverton Creek, this would be a nice trail option.
- I live off Johnson. This will add to an already bad traffic situation.
- Can get to most businesses without crossing TV Highway. Looks like coinnection to Tualitin Valey Rec trail.
- Johnson is my top choice. It is the option with the least amount of big obstacles (like jogs to get across major roads, lower speed streets that with fewer drivers, quieter road further from hwy noise). Just have to address the lack of bike/ped infrastructure on 170th to make this work.
- Too many driveways
- The distance from TV Highway will likely decrease the use by the people you're trying to attract most since many live in apartments closer to TV
- Johnson is used as a commute alternative to TV Highway not sure Johnson is developed to a point where it can support pedestrian and bike traffic during commute hours
- Yes, the impact on the residents
- This corridor has less traffic compared to the other options. This would be a best option and safest.
- There is already good infrastructure on that side of TV highway.
- That side of TV highway has good trails
- Johnson feels the safest option over Shaw and Blanton. It may not directly connect to commercial, employment, parks and schools as the other two options, but is this project about linking through the Tualatin Valley via Aloha? Perhaps a comprehensive Active Transportation Plan would be appropriate for Aloha area to accomplish these needed

- and desired connections as noted with the Blanton and Shaw options. Shaw needs some serious help as a multi-modal facility.
- Needs sidewalks, dedicated bike lanes, cameras to catch speeders and 20 mph speed limit
- keeping trail close to tv highway but north of the railroad tracks is the best option
- I think it is nice that it is away from TV highway. I don't see how it's enjoyable or safe if you are walking next to so much high traffic.
- interseccion en donde termina necesita ser renovada para asegurar todos involucrados, esepcialmente giros a la izquierda; esta cercas del transito metro de baseline; la calle 170 no tiene banquetas, ni espacio seguro para bicicleteros en la carretera entre TV Hwy y baseline

Question 3: SW Shaw Street Corridor: Are there things you think we should consider about this corridor?

- There is no easy way to cross either 170th or 185th. If there was a way it would be the best route IMO
- You could still make this area pedestrian friendly without putting a trail in. Also, a mixed
 use trail near shops and businesses creates its own issues. I've sat down at the
 restaurants along south waterfront park and watch bicyclist and runners dodge and run
 into the shoppers and people window shopping.
- I hate this option. The major street crossings would be nightmares to rearrange for safety and connectivity. The scenery is lousy. I'm not sure there's anything much good about it.
- Too close to the railroad. Noisy. Drivers are AGGRESSIVE near the railroad crossings. I
 have a terrifying experience every time I ride in the zone around TV Hwy.
- Dedicated/Protected bike/pedestrian infrastructure. Considerations about the railroad crossings should be made in the event that Rail Transit is implemented on this line, increasing crossings. Left turns for Bikes should also be avoided- bike boxes/dedicated crossings can avoid this.
- Many homeless live along there. Lots of trash, high crime in the area. If those are fixed, this would be best.
- continuity to other trails
- I have concerns about the lighting and safety of this corridor
- population density is to the north, plus crossing TV highway is not ideal
- Might be the easiest place to place a trail. There appears to be ample ROW.
- Without regular railroad crossings and crossings of TV Highway, this trail would be mostly locked off.
- Connectivity with business and transit is good here. Maybe a equitable choice. Concerns about litter, pleasantness, safety, impeding traffic yet more.
- The Shaw St alternative aligns most closely to TV Highway, which is both a positive and a negative (noise, air quality, and difficulty crossing arterials near existing major intersections).

- I like how close it is to TV Highway so walkers/bikers can veer off trail to TV to access businesses.
- This is on the South side of TV and it is too busy with too many businesses and too much traffic
- Crossings to close to TV Hwy. Turning vehicles from TV Hwy would not be expecting to look for bikes or pedestrians. Motor vehicles potentially stopped over tracks
- Access to businesses. Minimal driveway interruptions along north side of route.
- Shaw does have access to many businesses and apartments. However, it is a bit louder in terms of traffice than Blanton.
- This corridor would be least impacted by residential and commercial driveways. This is
 particularly important during the weekdays and commute times. Also, this route is close
 to major bus stops.
- More open, easier to build?
- This looks like a good route, but breathing exhaust from vehicles on TV HWY is unappealing. Perhaps adding a trail here could reduce some of the motorized vehicle traffic on the hwy eventually? I guess that's part of the idea...
- crossing SW 185th too busy for safe crossing?
- For recreational use, this is too close to the noise and air pollution of TVH
- Best route,, how did pass Intel to Cornelius pass?
- Running the trail along the railroad tracks is the best option. It requires the least amount
 of redevelopment, will increase services and property values along the low-value tracks.
 It would be imperative to provide many locations to cross TV Hwy to the north SAFELY.
- Not safe at all. Way to close to TV Hwy and cars travel way to fast.
- It's a great idea
- Has the least impact on residences, but the highest likelihood of the trail being blocked by parked cars - If using this route, cannot have on-street bike lanes, they will need to be raised or separated.
- Noise next to TV Highway and railroad tracks.
- This corridor is very noisy and pollution/vehicle fumes from TV Hwy, dangerous commercial traffic and unregulated parking.
- A little too close to TV Highway as far as noise and exhaust
- Safety concerns
- Visibility to trucks using area
- We think this is the best option for most people.
- It is the least used street of the 3 choices and in close proximity to TV highway businesses, transportation services.
- Parts of this trail would be difficult to ensure safety.
- This option seems to be the most costly and the one which will be least used as it does not connect to schools or other parks - least appealing as a community member
- This will continue to make yourself Hillsborough very nice
- ease of crossing major arterials; sight distance; vehicle speeds
- na

- Shaw seems like a more expensive way to go. Probably sidewalks or curbs would need to be installed.
- Safety; Shaw St does not currently feel like a safe area to walk or bike on
- The intersections where Shaw crosses 160th/170th/185th, etc. are all high congestion intersections. Would it be possible to put in bike/pedestrian tunnels under the roadways?
- I see some safety problems with this option, as acknowledged. But there is a fair amount of greenery and shade, which makes this option more appealing than the Blanton route.
- positive- along bus routes, main thoroughfare negative- busy with a lot of business access/traffic
- This option seems to be the best if it can be achieved
- Need careful consideration and large intersections. Otherwise best use of current roadway
- MIght bable to add more stops for food, drinks and parking
- Safety
- With Shaw St right next to the rail, it reduces the number of crossings on the north side of the road. With that said, its awfully close to the rail crossings at 185th and 170th so would require a bit of coordination with the railroad.
- Shaw street has to many businesses along for safety. I think a lot of customers coming
 into and out of the parking lots will not be looking for bicycles and pedestrians.
- I like it more businesses to visit and support
- A very narrow and congested in some areas such as 185th intersection. This should not be a chosen route.
- The impact on 185th traffic.
- Not very attractive
- Seems like the best option
- SW Shaw gives more access to safe crossings at busy intersections and local Aloha businesses
- I sometimes walk down this street as an alternative to Blanton. Doesn't go by schools like Blanton does, but does give options to avoid being on TV highway.
- The closest to TV Highway is the best option. Building crossings, traffic lights, and other infrastructure is what's needed to make this a practical way for people to live their lives if they can't afford a car. They need to get to shops, bus stops, day care, etc SAFELY on a bike. Or an adult trike for disabled people.
- I think this is the best option for the corridor because of its proximity to TV Hwy
 destinations; it has great POTENTIAL to be safe and inviting for peds and cyclists. To
 ensure the safety of the most vulnerable and least environmentally impactful users, the
 final trail design and crossings should radically change the character of the street to slow
 / stop car traffic and prioritize bikes and peds. Enhanced crossings to commercial and
 other destinations near the trail corridor should be included in project design.
- Is it close to any Max stops?
- This seems like a more natural traffic flow than Johnson. Also with the large amount of growth in South Hillsboro this would be a good option.

- Feels only slightly safer than other options: still too many interactions with driveways and motorized vehicles.
- Least busy street, but horrible & dangerous intersection at 185th. Would need overpass or something for bikes
- A direct route from downtown Hillsboro area to closer to downtown Beaverton is nice.
 This has the benefit of being closer to the Westline Trail, and a connection could be pretty easily made by adding bike infrastructure along 160th.
- Any improvement on this road will be amazing.
- Shaw Street is too close to TV Hwy, therefore a more unpleasant route than the alternatives. Too close to the railroad tracks also. Too many commercial lots.
- Safe crossings at major intersections.
- I like this option. It feels like there's less traffic, better visibility, and it connects to a
 variety of businesses and housing. Also, it would be easy to connect to Reed's Crossing
 and the greater South Hillsboro area. I'm concerned about buffering traffic and
 bikes/pedestrians. Speeding seems to be such an issue in our area. Would speed
 enforcement or speed reducers be included in this option?
- This will be a louder option, since its parallel to tv highway. but it will be closer to stores. If trying to recreate would be nice to have a less noisy option.
- With the traffic restrictions on Shaw St at several major intersections, and very close to the tracks, this seems problematic for crossing options for peds and bikes.
- Map shown at CPO 6 had it crossing 198th closer to TV highesy. The guard rail at 198th and railroad tracks is crunched. Crossing 198th & 185tth too close to TV makes me nervious. I'd rather ride TV. (I comuted to work, by bicycle in the 80's.) Your video doesn't show crossing 185th when busy.
- This is the least ideal option for me as a bike rider. It's too close to the hwy and unpleasant.
- Terrible intersection at 185th
- This would be a good option due to proximity to TV but an elevated cross will be a must at 185th and Shaw
- Better option than Johnson, as it's less heavily used during commute hours
- Yes, less residents impacted by potential "riff raff & bad guys†and more business access
- Pedestrians crossing alongside the rail road tracks. Needs more lighting.
- Shaw needs serious assistance to be a safe multi-modal street.
- Needs sidewalks, dedicated bike lanes, 20 mph speed limit, cameras to catch speeders and better traffic controls at intersections.
- Based on my current impression I would not feel safe walking in this area.
- I believe this is a good option to improve safety along tv highway. However it increases exposure for folks using the path to vehicle emissions and higher noise levels. As well it does not expose users to nature.
- I think this is too close to the highway. Unpleasant experience.
- Esta cercas del ferrocarril y los ninos de primaria si lo usan como ruta a la escuela o cercas, pueden tomar decisiones de alto riesgo; no optima vista para el corredor

Question 4: SW Blanton Street Corridor: Are there things you think we should consider about this corridor?

- Accessibility to Max line.
- Lower traffic on East of 209th
- Too many turns (too indirect) and too long a run with no shade.
- Dirt/gravel side road
- I vote for this option. I think it will improve the condition of this area, which presently is a bit run down. A trail would improve the neighborhood and increase safety here.
- connects over a longer distance. need to fix jog at 185th
- Looks crowded, houses on side could be too much or good for accessibility, depending on how it's set up.
- how to cross major imtersectios
- Consider having a soft surface section with dirt or gravel for runners and walkers in addition to a paved section for bikes
- Is the goal to provide a safe and quiet space for bikers and joggers....or is it an alternate corridor to for bikes and walkers to get to businesses?????
- Connection to RCT and the crescent park trail
- Too many driveways, I do not like the dotted connection to Pheasant Lane. It's residential with lots of trees, no sidewalks, sharp curves and the multiple school busses use this route during the 9 months of school, and many parents are already driving their children to school on this route and many drivers cut through this route to 170th from 185th. We need less traffic on this not county maintained route. Cutting down trees to put in sidewalks, bike paths, and curbs will change the entire character of this neighborhood. The school property fencing is locked year long and the only access is off 170th school parking area. That's not really a reason to run it past Beaver Acres School. Neighbors along Augusta across from the school already have traffic concerns with the street and the 8-10 school busses daily picking up and dropping off on the street Augusta.
- Leaves lower income areas north of TVHwy out of the connections created.
- Big trouble for crossing 185th.
- Also too many homes and much more narrow of streets
- corridors connect ahoha schools and design will need increased cost with student safety along this corridor
- This looks like the best option, one I would use.
- Lighting, homeowner concerns in this area, safety
- Seems like a lot of traffic already on this street-can it be made safe for walkers and bikers
- same as Shaw traffic problems I think
- a very close second to Johnson. 185th alignment is still troublesome.
- The crossing of 185th could be very problematic without a bridge or tunnel.
- Without a crossing quard, motorized vehicle traffic would be difficult to maneuver.
- Some areas of heavy traffic at eastern end.

- Sufficient safe access from North side of TV highway
- Jog in road at 185th could be challenging, signalized crossing at 170th is an advantage to SW Shaw. Connection to parks and schools is great
- Very hard to cross 185th and again near intel. Lots of trucks.
- Not to close or far from TV Highway and most scenic route.
- To disruptive to existing homes and neighborhoods. No sidewalks already there so would impact homeowners. Definitely do not like the Blanton B proposal. Would change the character and access for homeowners, too many trees would have to go, beaver acres school busses use this as a route for dropping off students and picking up students as they line up on Augusta. Already a lot of confusion for the neighborhood with many parents driving to pick up and drop off and gridlock mornings and afternoons on the street, heavy traffic daily and for the neighbors and pedestrians.
- I see a lot of businesses along this route and I wonder about conflicts between people riding bikes and people driving cars. The protected cycle lanes near the west end look great!Again, not a lot of sidewalks.
- I like how it connects to already existing bike lanes near cornelius pass
- Proximity to the new South Hillsboro development. We need new infrastructure on the North side of TV Highway (ie the Johnson Street route).
- This street is VERY poorly lit. Hopefully that would be corrected, if Intel commuters were to use it after work.
- Higher car traffic than Shaw. I think there is already a 185th Ave crossing project in the works.
- Would be better if it connected to a grocery store.
- Having children use the trail to access schools is obviously a good thing, but is it the safest route sharing the trail with commuters?
- Safety, How would you cross 185th?
- I work on Blanton and I would never ride or walk on Blanton or Shaw. To me it's a dangerous area / alot of police activity.
- We really need it here as it is so dangerous to walk your dog or bike on this road. I see
 so many people walking with kids and dogs and it is so scary watching them be almost
 hit by cars. I will only walk against traffic on Blanton as I am afraid my fog and I will get
 hit as there are no continuous sidewalks. The new park on 167th is great but very
 dangerous to walk to!!
- Too far from businesses, activities, etc. Not as active of an area for walkers and bicycle riders.
- Not as good as Johnson. Less accessible to families.
- As an avid cyclist, I feel that this route is the best option at achieving the project goals
 and objectives. It provides easy and safe access to connecting with a variety of desirable
 destinations.
- Blanton would be fun if you widened the road, it has fast traffic, would you continue to the westside trail?
- Crossing the major N/S roads (185th, 198th, 209th) would be difficult along Blanton.

- Blanton is always congested with cars ALWAYS parking along the curb -- this forces bicyclists into traffic
- Blanton between 165th & 170th is almost impossible to pass by car. Trail Traffic would make it Impossible.
- This is farthest from my home so it is my last choice. I really don't know the area to comment on the layout. The Johnson trail would also be close to the new park you are building along 187th. People could connect there and get more use of the park.
- This is probably the best option for connectivity, but would need some significant improvements for safety.
- Connecting the schools is a great plus for this option. I enjoy that it is further away from TV Hwy and the railroad. Haven't biked this route but it seem like it would be less stressful.
- Dedicated Bike/Pedestrian Lanes/Infrastructure, as well as a dedicated crossing at SW 185th (with a median?)
- Lots of crime in this area.
- population density is to the north. I think encouraging travel through the more dense areas might help
- Consider impacts to the residential neighborhood. It's a plus that it †connects'
 a number of schools.
- Please see my comments about Johnson Street
- Ability to connect with more areas. Passing parks. In area of new build and extension of Cornelius Pass
- Like the school connectivity. Possible extension to Powerline Trail would be sweet!
- I ranked the Blanton St alternative highest because a) it would be easier for people walking and biking to cross 170th and 185th at Blanton St than at Shaw St because Shaw St is so close to TV Highway and existing signalized intersections, b) it connects both Beaverton's powerline trail and Hillsboro's future powerline trail, and c) it is closer to TV Highway than the Johnson St alternative.
- Would be my second choice again easy access to TV Highway except like Shaw option most businesses are on the north side so crossing TV would be needed.
- Again too busy with too much traffic
- Offset intersection at 185th. Make sure that bikes and pedestrians can continue across
 while only waiting for one light cycle. Continues directly through to new SoHi
 development with its trails. Has direct connections through to Hillsboro.
- Access to parks and schools. Many driveway crossings.
- The Blanton section separates bikes from walkers. There is just to much of a speed difference for them to share the same trail. Also, the Blanton section places the bikes between parked cars and walkers. Car doors opening is a real issue!
- I like the idea of Blanton best. There are some areas, however, that we don't feel safe in terms of the people that have approached us and our children as we walk on Blanton, west of 185th. We like using this street for walking and biking and would love it to have paths.
- Too many people and cars.

- Would there be a conflict with parking along the rowhouses?
- Do the people that live on this street want this trail on their street? There were a lot of cars parked on the street. Where would they go?
- I like this option best for connectivity reasons... but I bike this road currently and people SPEED BAD and drive aggressively and dangerously. This will have to be addressed if we are going to promote biking on this route or people will get hit.
- yes! Getting across 185th. Terrible spot to try and cross.
- Blanton is the second best option, but it's too developed, crowded 160th to 185th
- Like Shaw St it is too close to TV Hwy and cars drive way too fast on this road. Not safe for bicycles or pedestrians.
- I like it
- Closest to parks and schools, and would make children walking to Kinnaman have a safer option. Need a light at Blanton and 198th to safety cross, especially now that 198th is being widened. Maybe the light at Shaw should be moved.
- This ties in with the already very accessible South Hillsboro area.
- This corridor is made up of the most driveways and it has the worst ability to cross intersections. Further it is the furthest away to connect up with trail.
- crossing 185th
- Although Shaw may be closer to TV Hwy for the eastern half, I think it is almost too
 close. I would prefer to ride on a less noisy, smelly route, even if a little longer. I would
 hope there would be some signage that would help folks know what destinations are
 ""off trail"" so they would easily know when to turn.
- How do people cross 185th? If they need to go to the crosswalk by TV HWY, then Shaw seems like the better trail option.
- I like this because it passes several parks. It's also not as close to TV Hwy.
- ease of crossing major arterials; sight distance; vehicle speeds
- Blanton doesn't have the same connectivity to powerline parks that Johnson does.
- Crossing 185th due to traffic congestion, the fact that Blanton does not line up straight across at 185th, the lack of street parking between 160th and 170th at the Park. Would bike/pedestrian tunnel be an option at major interesections?
- Although it's great that this route connects schools and parks, this would make safety an
 even greater consideration, and some of the intersections seem dangerous. The lack of
 trees and therefore shade along much of this route is also a problem for a route for
 pedestrians and cyclists. A possible remedy might be to have rest stops with shade,
 seating and water sources.
- postive- Connects the new South Hillsboro Crossing with businesses along TV Hwy, on bus route negative- traffic
- I think it could work, but as I understand them prefer the other two options better than this one
- Lack of business and difficult roadway to revamp
- There are a lot more driveways and so more conflict points along Blanton than Shaw.
- We need to think about safe access for pedestrians to all the schools, including Aloha High. Kinnaman is particularly dangerous for kids.

- Blanton street seems to be the best option. Local residents use this road to bypass TV
 hwy, so I would in courage installing speed bumps to slow traffic down. This option also
 appear to have better connectivity to the westside trail and any future trail expansion
 within the south Hillsboro (reeds Crossing) development.
- I like it! Seems more rural
- The best route West by far. A good section is completed through South Hillsboro and if the trees were eliminated along the strip as shown in the cross section, on street parking would be possible.
- This seems like the most useful and beneficial street to improve in the City.
- It seems like a great option since it runs through schools.
- Great connection to South Hillsboro
- Safety, not too many crossings
- Too far from the highway
- SW Blanton would be more ideal for connections to parks/schools and farther south neighborhoods from TV HWY.
- CHOOSE THIS ONE
- This makes sense. If you follow Blanton you end up in South Hillsboro. However, the section of Blanton between 160th and 170th (I walk this almost daily) is a pedestrian nightmare. No sidewalks, many many cars parked on the side of the road, especially at Barsotti Park.
- Do this one too. Students at all these schools are most likely to not own cars, or to have working parents who can't transport them to activities. These students need to be independent and able to get themselves around.
- Blanton street appears to be the best option for best access to bus, shopping centers and schools. This option would require a signal light to allow for safe crossing at 185th.
- This would be a fantastic neighborhood greenway, but not necessarily a regional trail alignment.
- It was pretty, but it ends a bit far from a Max stop.
- It does not conflict with the railroad crossings.
- Doesn't feel like a ""safe"" option: too many interactions with driveways and motorized vehicles!
- No opinion about this one as I rarely travel south of TV Hwy.
- This option is best from my perspective as someone who rides my bike everywhere. It's
 very close to the Westline Trail and is comfortable for people of most skill levels. The
 benefit of going by so many schools is definitely an advantage.
- Please make it safer for students to walk on Blanton.
- Blanton is better than Shaw, but still too close to the noisy and busy TV Hwy. Too many commercial lots and very densely populated, meaning too many vehicles on the road.
- Safe crossings at major intersections.
- I love this option. Blanton in Reed's Crossing is already really well situated for bike/pedestrian access. With the growing population in Reed's Crossing and South Hillsboro, connecting the Reed's Crossing Town Center as it develops to the surrounding area and connecting residents in Reed's Crossing to schools and businesses seems

really important. Given the concentration of existing and planned services and businesses in this area it seems to make sense that there should be trails connecting to/from here and help reduce vehicular traffic. I think one of the important aspects that should be considered along with this plan is a good connection from Blanton over to the north side of TV Highway so people can easily move north/south. Specifically, a raised pedestrian/bike structure that would reduce crossing TV Highway at grade. I think the trail should be continued west along Blanton and then connect to Century. Century would then allow additional connections to residential areas, retail, services, and the high school.

- Pretty much the same as shaw but a little guiter.
- Being farther away from the tracks seems like a better choice and gives more options for crossing treatments.
- Blanton would be perfect more access to new communities
- This option has promise, even if it helps to improve this as an overall connector route.
 The two big jobs are not ideal for safe riding or anyone who less comfortable on their bike. This route needs traffic calming to be viable.
- Not bad except crossing 185th
- Blanton is extremely narrow in a number of spots and with the schools can be heavily trafficked. This is also an alternate way to get from those schools to places of work like Intel that may add more congestion
- This is the least used option during commute hours, and it connects schools. Best choice.
- Yes, the impact on the residents
- Traffic is heavy in this area, would not consider this to be a the safest option. The roads are narrow aswell.
- You should consider on which side of TV highways is the majority of the population of Aloha. The decision should be made to benefit majority of the population
- Blanton can be a great connector for the Aloha community, safety improvements are necessary. Second best option after Johnson.
- Needs sidewalks, dedicated bike lanes, 20 mph speed limit, cameras to catch speeders and better traffic controls at intersections.
- I love the connectivity of this option: schools, parks and businesses. It also looks like some of the infrastructure already exists and drivers would expect to see cyclists there.
- According to the RWGPS Heatmap, this is the most travelled route of the options.
 Therefore folks feel its the safest
- Will increased foot and bike traffic negatively impact area residents?
- I believe this is the best option to improve south Aloha. It will evolve and impact an area that is usually left out and doesn't have as many resources put into re development. I also think it could impact a higher percentage of the community than Johnson street area, and also a community that does not have the socio economic level as north Aloha. I also believe that this option will provide the best immersion into nature out of all the options, and the best Connecticut to local schools and park with is great benefit. It is not that far off of Shaw street and could re direct some foot traffic or bike traffic away from the dangerous road of tv highway.

- Also better because it is not right by the highway.
- no conozco este calle muy bien

Appendix B: Destination Map Comments

Below are the comments respondents submitted in the destination map.

Location Name	Comment	Location Address
185th Produce	Parking is a problem, walking to it is better	1848 SW Alton St, Aloha, OR 97006, USA
Arnold park	place to picnic via bike	Arnold Park, 4155 SW 182nd Ave, Aloha, OR 97007, USA
Beaverton Creek Max stop	I walk to the max stop	Beaverton Creek, Beaverton, OR 97006, USA
Ace Hardware	Bike lane missing in front of store	3765 SW 185th Ave, Aloha, OR 97007, USA
Beaverton Creek Trail join	Merlo can be problematic though for bikes as it currently is configured.	Merlo Rd/SW 158th Ave MAX Station, Beaverton, OR 97006, USA
Arnold Park	Connection to recreation areas	Arnold Park, 4155 SW 182nd Ave, Aloha, OR 97007, USA
170th	Definitely need bike lanes added to make this option safe for riders. I currently refuse to ride this section of this road due to the narrow road and busy traffic.	2825 SW 170th Ave, Beaverton, OR 97006, USA
170th and Shaw	A recommend creating a pedestrian/bike tunnel under 170th to allow a safe uninterrupted crossing via Shaw st. People still run across even though their is a crosswalk near by	3880 SW 170th Ave, Beaverton, OR 97078, USA
Arnold Park	Play areas	Arnold Park, 4155 SW 182nd Ave, Aloha, OR 97007, USA
Ace Hardware	Able to shop at neighborhood/local hardware store.	19477 SW Tualatin Valley Hwy, Aloha, OR 97003, USA
170th and TV Hwy	This intersection is terrifying as a ped or bike	17038 SW Shaw St, Beaverton, OR 97007, USA
173rd Avenue	If a southern route is preferred, a hybrid/fourth option might include use of Blanton east of 173rd and Shaw to the West, using 173rd to cross between the two. That would avoid the ugliest and most congested part of Shaw and provide a better connection to the Powerline Trail at the east end than following Shaw alone. I'd still personally lean towards just using Blanton all the way through, however. I just don't like the Shaw option much at all.	3960 SW 173rd Ave, Aloha, OR 97007, USA
Barsotti Park	Blanton is very narrow, with parking on both sides of street. Hazardous area for existing foot traffic	16597 SW Blanton St, Aloha, OR 97078, USA
Aloha Doc & Cat Hospital	Safe access to care for pet	17335 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Aloha Food Carts	Great place to eat a variety of foods	18673 SW Tualatin Valley Hwy, Aloha, OR 97006, USA

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Aloha Food Carts	Access to a local food option would be great	3400 SW 187th Ave, Aloha, OR 97006, USA
Aloha High School	Closest access to High School for students needed	18550 SW Kinnaman Rd, Beaverton, OR 97007, USA
Aloha Library	Important neighborhood hub	17435 SW Farmington Rd, Beaverton, OR 97007, USA
Aloha Post Office	Can spend a long time waiting for safe crossing across 185th.	18955 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
aloha swim center	get to swim center and high school	18836 SW Butternut St, Beaverton, OR 97007, USA
Beaver Acers	I love that this will give my children the accessibility to walk or ride their bikes to school safely, in addition to providing a safe route for them to see their friends outside of school hours!	2125 SW 170th Ave, Beaverton, OR 97006, USA
Beaver Acres	Those that live north of TV Hwy could commute to schools that options of Shaw and Blanton would not allow	2125 SW 170th Ave, Beaverton, OR 97006, USA
Beaver Acres Elementary School	Kids that attend Beaver Acres Elementary School that live south of Beaverton Creek could ride their bikes to school without riding on 170th or 185th!	2125 NW 170th AVE, BEAVERTON, Aloha, OR 97006, USA
Calvary Chapel Worship Center	Would love a connection to the new road on 209th.	6550 SE Alexander St, Hillsboro, OR 97123, USA
Crunch Fitness	Fitness club with showers	17800 SW Kinnaman Rd, Aloha, OR 97078, USA
CSL Plasma	This in the only plasma donation center on the Westside of PDX.	1938 SE Hemlock Ct, Hillsboro, OR 97123, USA
dentist office	Need to get back to Blanton w/o crossing street	SW 185th & Blanton, Aloha, OR 97007, USA
Don Chilito's	Simple food, take out or eat in.	18335 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Barsotti Park	With parking next to the park and across the street next to the condos, it is extremely congested. Road widening would be needed as often it is so congested that only one car can go through on Blanton. I worry about pedestrian safety every time I drive on Blanton. Please select Shaw over Blanton for safety.	16777 SW Vincent St, Beaverton, OR 97007, USA
Beaverton Powerline Trail	More access to trailhead points and or connectivity would be great!	4214 SW 159th Ave, Beaverton, OR 97007, USA
Dry Cleaners	Drop off your dry cleaning	17675 SW Farmington Rd, Aloha, OR 97007, USA
Dutch Bros	coffee chain	2977 SE 73rd Ave, Hillsboro, OR 97123, USA
gales ck	a good way to ride our of the city safely	53815 NW Our Ln, Gales Creek, OR 97117, USA
Johnson Sidewalks	Johnson has many walkers however it lacks a sidewalk, bike lane, or even a parking strip to separate from cars and too fast truck drivers.	20380 SW Johnson St, Aloha, OR 97006, USA
End here why?	Why end here? Connection to grocery stores or other parks would make more sense.	6755 SE Blanton St, Hillsboro, OR 97007, USA

SW Johnson St.	Be careful what you ask for regarding the widening of Johnson St. Look at the property lost by the majority of owners that live along SW 198th Ave between TV Hwy and Farmington Road! Having sidewalks allows safer pedestrian traffic without increased road traffic, increased speeds (we can hear it), AND reduces the amount of property lost by property owners. Of course property owners will then be required to maintain the sidewalk, which is dumb because the city gives them no choice in the matter, but that's another argument for another day.	2630 SW 198th Ave, Aloha, OR 97006, USA
Barsotti Park	A nice park with a short (and open) loop walking trail, playground, and picnic shelter.	16597 SW Blanton St, Aloha, OR 97078, USA
Best connection to bike trail heading north	Routing the new trail to the north side of TV highway somewhere before the intersection would work best the pedestrian crossing at the home for boys should be upgraded. Be best though if it were a light that was timed with others on TV!	SW Tualatin Valley Hwy & Millikan Way, Beaverton, OR 97006, USA
Merlo MAX	Can use the MAX to get to a bunch of places.	Merlo Rd/SW 158th MAX Stn Turnaround, Beaverton, OR 97006, USA
184th Ave	I recommend the trail run south on 184th and then west on Kinnaman rather than at 185th and Blanton. This would allow Aloha High School to be part of the loop as well. (Correction of previous comment with wrong street)	18350 SW Wheeler Ct, Aloha, OR 97007, USA
Johnson Widening	I think Johnson is the best option, but the street needs to widened. It is well traveled and too narrow in its current state.	2640 SW 204th Ave, Aloha, OR 97006, USA
Barsotti Park	Playground, baseball field, grass area	16570 SW Blanton St, Beaverton, OR 97007, USA
East Harbor Restaurant	Chinese restaurant that serves dim sum on the weekends.	18855 SW Tualatin Valley Hwy, Aloha, OR 97003, USA
Every Day is a Donut Day	Donuts!	18955 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Best bike connection to the Nature Park is here.	This would be the best routing for connectivity to the Nature Park by bike. Traffic crossing would be necessary for safety however.	2425 SW 170th Ave, Beaverton, OR 97006, USA
158th/Nature Park MAX station	Johnson route would connect to Blue (and soon Red) MAX lines.	Merlo Rd/SW 158th MAX Stn Turnaround, Beaverton, OR 97006, USA
Faith Center Aloha	Church we attend	20229 SW Tualatin Valley Hwy, Beaverton, OR 97003, USA
Blanton Park	Nice place to rest	16570 SW Blanton St, Beaverton, OR 97007, USA
Champions Park	Park and sports complex with trails and an extensive playground.	Unnamed Road, Aloha, OR 97007, USA
Connection with	Connectivity with the Nature Park here is a key positive for this route.	17035 SW Johnson St, Aloha, OR 97006, USA

1	and Blanton. This would allow Aloha High	
	School to be part of the loop as well.	
185th & Blanton West to Blanton East	This section of road is already very dicey for pedestrians and cyclists. I have walked this	3802 SW 185th Ave, Beaverton, OR 97078, USA
to Blanton East	area many times with a dog. There is a lot of	Boavertern, 617 67 67 6, 667 7
	traffic and I have always considered this area	
	to be unsafe when not in a vehicle. Please	
	install an alternative travel bridge like they	
	have in some parts of Portland. This set of	
	intersections is absolutely terrifying at night	
	when Aloha HS has an event begin or end.	
185th & Shaw	This intersection is absolutely awful. I like the	3765 SW 185th Ave, Aloha, OR
	Shaw option for the low traffic/close to TV	97007, USA
	Hwy, and I ranked it highly, but this	
	intersection will be a huge problem. I can't	
	navigate it in my car, and introducing	
	bicyclists will make it even trickier and more	
40511 0 01	dangerous. Maybe a bike overpass?	0705 014/405/1 A ALL OD
185th & Shaw	This intersection is absolutely awful. I like the	3765 SW 185th Ave, Aloha, OR
	Shaw option for the low traffic/close to TV	97007, USA
	Hwy, and I ranked it highly, but this	
	intersection will be a huge problem. I can't	
	navigate it in my car, and introducing bicyclists will make it even trickier and more	
	dangerous. Maybe a bike overpass?	
Fire Station	Improves safety along trail.	3600 SW 209th Ave,
The otation	improves safety along trail.	Beaverton, OR 97007, USA
Fire, EMT	Quick trail response to any medical	3600 SW 209th Ave,
1 110, 21111	emergencies.	Beaverton, OR 97007, USA
Food an drink	21+ for a beer and burger or other food on a	3765 SW 185th Ave, Aloha, OR
	nice ride/walk	97007, USA
Big Fir Trail	None of the trails in the southwest corner of	17035 SW Johnson St, Aloha,
(THP&RD Nature	the park are open to bikes and opening them	OR 97006, USA
Park)	to bikes is probably not a good idea.	
185th crossing	Provide signalized crossing if Blanton	SW 185th & Blanton, Aloha, OR
	selected	97007, USA
Franz Bakery Outlet	Cheap bread items	18055 SW Tualatin Valley Hwy,
		Aloha, OR 97006, USA
Fred Meyer	Connecting to Grocery Stores is critical to	6609 SE Johnson St, Hillsboro,
	building a useful network and not just a	OR 97123, USA
Game store	recreational trail. Great small business	18095 SW Tualatin Valley Hwy,
Game store	Great small business	Beaverton, OR 97006, USA
Hardware store	Very handy store and usually busy	3480 SW 185th Ave,
Tialuwale Stole	Voly harry stole and usually busy	Beaverton, OR 97006, USA
Hotel	I believe a large hotel is going on on this lot	17300 SW Alexander St,
		Beaverton, OR 97006, USA
Indian Hills	This school has play grounds and play fields.	21293 SW Rock Rd, Aloha, OR
Elementary School	, , , , , , , , , , , , , , , , , , , ,	97006, USA
Intel	Great route for Intel workers to use	FAB5, Aloha, OR 97007, USA
	alternative transportation to work in addition	
	providing options for exercise during off	
	times or breaks.	
ISB	Blanton needs to be safer for this 6-12	17880 SW Blanton St, Aloha,
	school	OR 97007, USA

Pedestrian crossing here could be improved and upgraded for crossing TV here.	Would allow potentially a safer routing to the bike trail at Millikan intersection with TV to the east.	SW Tualatin Valley Hwy & St Marys Home, Beaverton, OR 97006, USA
Bus Stop	Bus stop for connecting on a commute involving more than one mode of transportation	SW 185th & Blanton, Aloha, OR 97007, USA
Connection to	If picking Shaw or Blanton, there needs to be	4214 SW 159th Ave,
powerline trail	an improved connection to the powerline trail	Beaverton, OR 97007, USA
ISB	school access from TriMet stops	17880 SW Blanton St, Aloha, OR 97007, USA
Pedestrian Bridge?	This has been "planned" for years but keeps getting put off. It would be huge to have access to schools and the Nature Park without having to use 170th.	17680 SW Augusta Ln, Beaverton, OR 97006, USA
Kaiser Aloha Dental office	for teeth health	17675 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Cooper Mntn Nature Park	Better access to trails	Unnamed Road, Beaverton, OR 97007, USA
kinnaman elementary	school - with after school programs - summer lunch program	4205 SW 193rd Ave, Aloha, OR 97078, USA
Jenkins Park	Excellent long ride from Rock Creek area for a picnic.	Unnamed Road, Beaverton, OR 97007, USA
Johnson/170th near	Connection to Nature Park would be great	17035 SW Johnson St, Aloha,
Nature Park	here. Going north to the MAX would be treacherous without sidewalk and bike lane improvements on 170th.	OR 97006, USA
Meliah Park	Nice tennis courts, playground and wooded area here. Needs better park patrols.	3005 SW 180th PI, Aloha, OR 97006, USA
Connection with Powerline!	Just a little further extension would make the Blanton path more attractive.	4214 SW 159th Ave, Beaverton, OR 97007, USA
Crowell Court Park trails	A very nice set of trails and bridges was just added in this area along a creek. It's now a nice connecting pedestrian through-way between Pheasant and the neighborhoods to the Northeast.	17768 SW Pointe Forest Ct, Beaverton, OR 97006, USA
Movies on TV	A safe route to connect to the nice trails in Reeds Crossing would be great!	SW, 2929 SW 234th Ave, Hillsboro, OR 97123, USA
Mt. Williams Park	Heavily wooded nature park with nice trails and great views. Connects to the Power Line Trail.	6168 SW 162nd PI, Beaverton, OR 97007, USA
Nature park	Access to nature park with trails	2885 SW 170th Ave, Beaverton, OR 97006, USA
Nature Park	Beautiful outdoors are good for health and liveability.	17035 SW Johnson St, Aloha, OR 97006, USA
Nature Park	Provide connectivity to THPRD Nature Park	17035 SW Johnson St, Aloha, OR 97006, USA
Nature Park at Johnson/170th	Would need better marked crossing for pedestrians/bikes (if the crossing was at the north entrance (where bikes are allowed in the park) - cross walk, flashing lights, etc.	17035 SW Johnson St, Aloha, OR 97006, USA
Nature Park Connection	Johnson to 170th is an easy connection to the Nature Park	2725 SW 170th Ave, Aloha, OR 97006, USA

Ladd Acres Elementary	Ladd Acres Elementary, home to Reedville Baseball.	21901-22099;21900-22098 SE Johnson St, Hillsboro, OR 97123, USA
185th/Shaw or Blanton	Pedestrian/Bike tunnel under 185th to travel Shaw or Blanton without having to cross highly congested traffic intersections.	SW 185th & Blanton, Aloha, OR 97007, USA
Augusta and 170th	Why not connect to the Nature Park here? A stoplight or traffic stopping pedestrian crossing connecting to a real sidewalk down to the nature park here would be wonderful.	17030 SW Augusta Ln, Beaverton, OR 97006, USA
Augusta Ln Bridge	Please build a pedestrian bridge over Beaverton Creek	17460 SW Pheasant Ln, Aloha, OR 97006, USA
Augusta LN creek crossing	A pedestrian bridge is proposed for this location, but it doesn't exist at this time. I live in the neighborhood and this has been planned every since before I moved in 22 years ago. I'm not holding my breath that it's going to appear anytime soon.	17460 SW Pheasant Ln, Aloha, OR 97006, USA
Augusta Ln Ped Bridge	Since there is already a project to build a pedestrian/bicycle bridge at this location, make use of it for the trail development as well. It will make connections to/from the MAX line stations at Elmonica and Merlo much easier and will work well for those with children going to Beaver Acres Elementary.	17440 SW Augusta Ln, Beaverton, OR 97006, USA
blanton & cornelieus pass rd	Lots of business are supposed to be added here so in the future this will be a popular destination.	SE Blanton St, Hillsboro, OR 97007, USA
blanton and 160th	Allows bike access to the Portland Clinic but you can also continue north to the nature trail to the east behind the clinic and be inside the nike area which includes bike lanes to continue the ride vs. ending with no option but to turn back which is the case with our third and fourth choices of Johnson route.	16185 SW Blanton St, Beaverton, OR 97007, USA
blanton and corn pass	This joins the new, modernized, South Hillsboro and there are bike lanes and paths that continue West and southwest. These go right past our friends new house and we could ride our bikes to visit not drive a car best option vs. being dumped at the west of of the other options	6755 SE Blanton St, Hillsboro, OR 97007, USA
Powerline trail	close proximity to an already well established trail is a positive connecting route while avoiding traffic	4235 SW 160th Ave, Beaverton, OR 97007, USA
Augusta Lane Bridge	Please let this bridge actually happen! It would be so much better of a connection for the area cut off by the creek to get to the MAX, shops, etc without dealing with terrifying 170th.	17460 SW Pheasant Ln, Aloha, OR 97006, USA
New park being developed	Construction work is underway here and I've been told it is for the installation of a new community park.	2135 SW 187th Ave, Beaverton, OR 97006, USA
Noble Woods Park	Large, beautiful, heavily-wooded park with pedestrian-only trails, creek, and bridges.	6290 E Main St, Hillsboro, OR 97123, USA

blanton between 198 and 185	Ped/Bike signal could be made for crossing 185th south of the post office and Blanton to the east of 185th desparately needs to be modernized so those on this block would be elated to have such a nice modernization of their neighborhood, sidewalks, bikepaths much like the modenization has done on parts of 198th in the current project between Shaw and Farmington which has made there neighborhoods really visually attractive and safer so the 198th bike lines will also connect with 198th going southbound bikelines, yet another option / route to access the TV Trail via safe bike and pedestrian paths. thank you for this project I cannot wait for it to be completed.	19325 SW Blanton St, Beaverton, OR 97007, USA
Powerline Trail	Connecting to the Powerline Trail would create a comfortable, low-stress route that reaches many destinations.	4258 SW 159th Ave, Beaverton, OR 97007, USA
Powerline Trail Connection	Please connect the regional trail to this powerline trail for more access for more users!	4214 SW 159th Ave, Beaverton, OR 97007, USA
RCT Trail	Connecting RCT trail to Tualatin Nature Park via option A would give more choice because you can turn and easily access pedestrian bridge	2377 SW 214th PI, Beaverton, OR 97006, USA
Library	Better access to the library	Unnamed Road, Aloha, OR 97007, USA
Library	Would be great for the Aloha Library to have a prominent location easily accessed by the TV trail.	17536 SW Kinnaman Rd, Aloha, OR 97007, USA
Park	Excellent nature park	Elliot Path, Beaverton, OR 97006, USA
Continue trail along Blanton to Century	Extending the trail west along Blanton to Century and then North would make a lot of sense. This would connect additional residential areas, retail areas north of TV Highway, and Century High School.	7082 SE Blanton St, Hillsboro, OR 97123, USA
Bypass TV hwy	To many vehicles already use this road to by pass TV Hwy. if this is chosen, speed bumps will need to be installed to slow traffic down	2725 SW 187th Ave, Beaverton, OR 97006, USA
Corner of Augusta and 170th	Why turn North to terminate the trail at Merlo instead of south to the Nature Park for this option?	17030 SW Augusta Ln, Beaverton, OR 97006, USA
Rock Creek Trail Connection	Important connection.	21460 SW Johnson St, Beaverton, OR 97006, USA
Park	Beautiful neighborhood park	4029 SW 180th Terrace, Beaverton, OR 97007, USA
Manila Market	A grocery store selling produce and food ingredients from the Philippines and East Asia	17065 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Park on Blanton	I would love a safer way to get to this park. Street parking and traffic can be daunting in the winter.	16653 SW Blanton St, Aloha, OR 97007, USA
Pedestrian bridge	Connect to planned bike/pedestrian bridge	17460 SW Pheasant Ln, Aloha, OR 97006, USA

mexican bakery	Great local bakery	18370a SW Tualatin Valley Hwy, Aloha, OR 97006, USA
Mexican restaurant	Great and popular restaurant	17985 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Crossing 185th while on Blanton	I would highly suggest as another person suggested, perhaps a pedestrian cross signal here. I like many people would find it very beneficial considering we walk and commute this distance, either as you are coming to 185th, or more directly across from the postal office sidewalk.	SW 185th & Blanton, Aloha, OR 97007, USA
MaxPlus	closer to MAX stops and path to Waterline	17035 SW Merlo Rd, Beaverton, OR 97006, USA
MAXplus	better access to MAX stop and path to Waterline	16900 SW Merlo Rd, Beaverton, OR 97006, USA
MAX & Waterline	gets closer access to MAX stop and the pathway to Waterline	16900 SW Merlo Rd, Beaverton, OR 97006, USA
Johnson Street	Making Johnson multi-purposecars, bikes, pedestriansis an awesome notion. Yes, the street would need widening. Please, 'make it so!'	20525 SW Johnson St, Aloha, OR 97006, USA
Aloha Food Cart Pod	Great tacos (and other items)!	3400 SW 187th Ave, Aloha, OR 97006, USA
Mosque	There is high traffic around the Mosque certain times of the week. They have done alot to increase parking capacity, but area is still hazardous during peak traffic times.	16265 SW Blanton St, Beaverton, OR 97007, USA
Park side of 170th	A wide shoulder/sidewalk/bridge expansion is needed on the park side of 170th. If a better way of crossing 170th is only added to 1 access point of the park there needs to be a safe way to get to the other entrance. Currently there is only one safe passage over the bridge and it is on the other side of the road.	2725 SW 170th Ave, Aloha, OR 97006, USA
Powerline park near Rock Creek	Please don't pave another one of the very few places left we can walk our dog in the grass!	21305 SW Lenore Ct, Aloha, OR 97006, USA
Movie Theater	A decent movie theater	SW, 2929 SW 234th Ave, Hillsboro, OR 97123, USA
Reedville Creek Park	A nice park with a concrete skate ramps, relatively close to and accessible from Trachsel Meadows.	1831 SE Cornelius Pass Rd, Hillsboro, OR 97123, USA
11-Jul	This is a possible stop on the ride,	21785 G-L SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Dangerous intersection at Blanton/185th	Needs a safe crossing for bikes/peds	SW 185th & Blanton, Aloha, OR 97007, USA
Nike	The Johnson route would allow many commuters that work for Nike to commute by bike or jogging	Nolan Ryan Building, SW Burlington Dr, Beaverton, OR 97006, USA
OHSU West Campus	The OHSU West Campus employs hundreds of employees, many of whom live in	18671 NE Cedar Falls Loop, Hillsboro, OR 97006, USA

	Beaverton. A safe connection between this campus and downtown Beaverton would be incredibly useful.	
Blanton St narrow streets	The entire Blanton Street from 170th to 185th is a very narrow road. Cars street parking make it more narrower and harder for pedestrians to walk along. Most of the street does not have sidewalks on either side. If the road is able to be expanded somehow, it would greatly reduce the risk of an accident happening to pedestrians and commuters	17955 SW Blanton St, Aloha, OR 97007, USA
Oregon Eye clinic	using it. A clinic with several doctors and many patientsl	18265 SW Alexander St, Beaverton, OR 97006, USA
Paper Parachute and Whimseys	Arts Supply and Scrapbooking stores	16770A SW Shaw St, Beaverton, OR 97007, USA
Park Lanes	Bowling Alley	6360 SE Alexander St, Hillsboro, OR 97123, USA
Philip's Orthodontics	This is where my orthodontist is	18325 SW Alexander St, Beaverton, OR 97006, USA
Piper's Perks	Safely walk to one of the best coffee stands in the area.	18641 SW Tualatin Valley Hwy, Beaverton, OR 97003, USA
Plaid Pantry	Convenient store near Blanton St.	3875 SW 170th Ave, Beaverton, OR 97007, USA
Portland Clinic	Medical office	15950 SW Tualatin Valley Hwy, Beaverton, OR 97003, USA
Portland Clinic in Beaverton	I would probably, mostly be transiting fro Cornelius to Beaverton but sometimes going to PCB	16185 SW Blanton St, Beaverton, OR 97007, USA
Our house	Our home and most of our business is located off of Johnson & Cornelius Pass, so the Johnson route would be our first preference. All 3 routes will be FANTASTIC once they are done.	20645 SW Clarion St, Beaverton, OR 97006, USA
Neighborhoods	What is the purpose of the Trails? Recreation? Commuting? How will the Residential Properties be impacted? More Traffic? Taking of Properties? Will it add paved Trails or Painted Bike Lanes on existing roads? Without answers to these questions, Johnson "A" is the most pleasant.	21470 SW Regal Ln, Aloha, OR 97006, USA
Johnson	Why zigzag down south if you're planning to build something over this wooded area anyway? It would be much easier to follow the trail if it stayed on Johnson	17435 SW Johnson St, Aloha, OR 97006, USA
Rood Bridge Park	recreational cycling route	Rood Bridge Park, 4000 SE Rood Bridge Rd, Hillsboro, OR 97123, USA
Rood Bridge Park	I love going to this park.	Rood Bridge Park, 4000 SE Rood Bridge Rd, Hillsboro, OR 97123, USA
Farmington Road	I can use Farmington Road to get some of the way home.	4760 SW 160th Ave, Beaverton, OR 97007, USA
Frequently Jogging Spot	I have frequently jogged from home to here but the road does get narrower westward. I like there are less traffic around here.	19630 SW Shaw St, Aloha, OR 97007, USA

Good access point	Bike safe connectivity with points north on	17425 SW Augusta Ln, Aloha,
for points north on 185th	185th south of Baseline.	OR 97006, USA
Intersection at TV Hwy & 170th	This is a busy intersection with a barrier between the lanes heading north and south. This would make crossing here difficult and dangerous.	SW Tualatin Valley Hwy & 170th, Cooper Mountain - Aloha North, OR 97006, USA
South side of Blanton	There is a new modern park here but limited parking so allowing biking to the park would be optimal best choice vs. biking to Les Schwab or an Auto Body shop. (Shaw Option)	19325 SW Blanton St, Beaverton, OR 97007, USA
Trail connector to RCT	Way to travel North to RCT	21470 SW Regal Ln, Aloha, OR 97006, USA
Intersection at TV Hwy & 185th	This is a busy intersection with a barrier between the lanes heading north and south. This would make crossing here difficult and dangerous.	3675 SW 185th Ave, Beaverton, OR 97007, USA
Intersection of Augusta and Chatelain	Routing the Johnson-B option to the south at this point to connect straight across to the Nature Park seems like it might be a better option. The neighborhood to the south has sidewalks and wide streets with little onstreet parking and almost no traffic.	17340 SW Augusta Ln, Beaverton, OR 97006, USA
Post Office	We often walk to post office	19325 SW Blanton St, Beaverton, OR 97007, USA
Post Office	easy access to the library	3800 SW Blanton St, Aloha, OR 97007, USA
Post Office	Connectivity to essential business like a post office, grocery store, restaurants would be ideal.	3730 SW 185th Ave, Beaverton, OR 97007, USA
produce market	fresh fruit and veg!	18385 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
South Vendla Park dogleg	Unless some infrastructure (trail, bridge/boardwalk) that doesn't exist is provided here, the trail would need to follow Arborcrest to the south. That road is crowded with driveways and a lot of cars parked along the curbs. There are sidewalks, but they're often at least partially obstructed.	17435 SW Johnson St, Aloha, OR 97006, USA
Intersection of Blanton and 185th	Crossing the busy five-lane 185th here without the benefit of a signal would be difficult and dangerous. It may be moderately preferable to the Shaw option, but neither one is an attractive possibility.	SW 185th & Blanton, Aloha, OR 97007, USA
Vine Maple Trail (THP&RD Nature Park)	A short section of the Vine Maple trail is unpaved at this end of the park. Otherwise, it is paved all the way through the park and connects to other paved trails, including ultimately the Powerline Trail on the far side of the park.	2360 SW 170th Ave, Beaverton, OR 97006, USA
Length of Johnson	The community really needs a safe place to walk, bike, exercise. People frequently walk, run, etc., but do so in the street due to intermittent at best sidewalks.	20765 SW Johnson St, Aloha, OR 97006, USA

Intersection of Johnson and 185th	Existing traffic signals with bike and pedestrian controls make this the best	SW 185th & Johnson, Aloha, OR, USA
	crossing of 185th.	
THPRD Nature Park	Important connection.	17035 SW Johnson St, Aloha, OR 97006, USA
Expensive New Houses	This is a massive new development	SE Blanton St, Hillsboro, OR 97007, USA
Produce Stand	Local produce and kombucha	18485 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
THPRD property	This area looks connected on the map, but it is not. It would be great if Arnold Park we're officially expanded and included this area in an intentional way (maybe a dog park).	4053 SW 182nd PI, Beaverton, OR 97007, USA
The Masters Apartments	Home	4505 SW Masters Loop, Aloha, OR 97078, USA
Produce stand	Fruits and veggies! Also growler fills for beer and kombucha	18485 OR-8, Aloha, OR 97006, USA
Public storage	Just the sound of the traffic here on TV Hwy (very long in between stoplights) and the exhaust fumes concentration would make me never want to use this trail unless I absolutely had to.	SW Tualatin Valley Hwy & 192nd, Aloha, OR 97003, USA
Rainy Day Games	Great game shop	18055 SW Tualatin Valley Hwy, Aloha, OR 97006, USA
Rainy Day Games	Fantastic local game store	18015 SW Tualatin Valley Hwy, Aloha, OR 97003, USA
Rainy Day Games	Best game store on the Westside!	18095 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Rainy Day Games	A great local business my family likes to visit!	17899 SW Tualatin Valley Hwy, Aloha, OR 97006, USA
Trachsel Meadows Park	This section of the park needs a paved trail that will connect to the TV Trail on Johnson. The paved portion stops North of August and then starts again North of Jay St. Living close to the unpaved portion I see probably 50 people a day using it and would get great use of it being connected.	21515 SW Erin Ct, Beaverton, OR 97006, USA
Tualatin Hills Nature Park	To go hiking/biking here	Tualatin Hills Nature Park Big Pond, 15655 SW Millikan Way, Beaverton, OR 97006, USA
Tualatin Hills Nature Park	Recreation Destination	15655 SW Millikan Way, Beaverton, OR 97006, USA
Missed Opportunity!	This is now another eyesore on the landscape with self storage. The city missed an opportunity to buy it from Intel when it sat as an empty parking lot. Could've been a nice park, farmers market, food pod court multi purpose community space in an excellent location.	19730 SW Shaw St, Beaverton, OR 97007, USA
New development cut through	Has anyone seen the traffic on this new cut through from Cornelius Pass?? Not the safest place to have a trail that is designed to increase safety	6755 SE Blanton St, Hillsboro, OR 97007, USA
Johnson	Everyone will want to park on our side street to walk the trail. Bad, bad idea. Johnson will	20265 SW Johnson St, Aloha, OR 97006, USA

	end up with more speeders and more traffic if you make it easier for them. I am furious that anyone would consider this.	
Johnson Street	I live off Johnson. The traffic is AWFUL. We don't need more! It's already way too congested.	2618 SW 201st Ave, Beaverton, OR 97006, USA
Rainy Day Games	A great, friendly, local game store.	18005 SW Tualatin Valley Hwy, Beaverton, OR 97003, USA
Jog in the route at 174th/175th	The jog is apparently due to the tight space with apartments on both sides of narrow street; I agree that going straight with Johnson (through the undeveloped area is much better	2816 SW 176th Ave, Beaverton, OR 97006, USA
Johnson & 178th	Turn north from Johnson on 178th. This route will more easily connect with the Beaverton Creek trail and passes very near Beaver Acres Elementary school	2750 SW 178th Ave, Beaverton, OR 97006, USA
Johnson St where it crossed 185th	I really appreciate the bike crossing signal to help ensure the light changes when I am going through this intersection. It is part of my bike commute and I would love to see more of them at big intersections.	SW 185th & Johnson, Aloha, OR, USA
Johnson Street	If a crossing is added here it should be pedestrian only. Cutting straight through would probably cause a bunch more traffic on Johnson St	17309 SW Benji Ct, Beaverton, OR 97006, USA
Johnson west of 216th	Running the trail all the way to Cornelius Pass Rd on Johnson and including the section west of 216th would be more direct if your intended destination was merely Cornelius Pass Rd. But it seems like "terminating" it at Trachsel Meadows might make more sense.	21810 SW Regal Ct, Aloha, OR 97006, USA
Millikan Way	Millikan way makes a decent route into Beaverton. If needed, Millikan Way could easily undergo a road diet to add bike lanes. On the other hand adding bike lanes outside the roadway could be added at a later date.	16030 SW Audubon St, Beaverton, OR 97006, USA
Tualatin Hills Nature Park	Would love safer access for pedestrians and cyclists to the nature park from either Shaw or Blanton.	Vine Maple Trail, Beaverton, OR 97006, USA
Missing Crossing on 185th for bikes/peds	Critical gap on Alexander needs to be addressed	3375 SW 185th Ave, Beaverton, OR 97006, USA
Reedville Cafe	Local eatery we enjoy	7575 SE Tualatin Valley Hwy, Hillsboro, OR 97123, USA
Blanton to Century	Extend the trail west along Blanton to Century. This would connect additional residential areas, retail areas north of TV Highway, and Century High School.	7226 SE Blanton St, Hillsboro, OR 97123, USA
Critical sidewalk gap on TV highway	This is a critical sidewalk gap where neither side has a sidewalk	SW Tualatin Valley Hwy & 170th, Beaverton, OR 97006, USA
Non-existent road	Would this be a new trail connection through this property?	2955 SW 175th Ave, Aloha, OR 97006, USA

Road	I almost get hit in my car here, I can't imagine anyone walking or biking, super dangerous	19478 SW Shaw St, Aloha, OR 97007, USA
Road	Narrow road, already limited parking for houses, sidewalk would take even more away.	19325 SW Blanton St, Beaverton, OR 97007, USA
Sidewalk needed	Need connected sidewalk all along sw Blanton. Road is also very narrow.	18120 SW Blanton St, Aloha, OR 97007, USA
Johnson Rd.	Johnson is a busy cut-through for cars bypassing 185th/TV Hwy intersection. Speed bumbs needed.	2723 SW 181st Terrace, Aloha, OR 97006, USA
Reedville Elementary School	The Reedville elementary school is here along with its play grounds and play fields.	2785 SW 209th Ave, Beaverton, OR 97006, USA
Roxy's Hawaian	Delicious shoyu, katsu and mac	20145 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
203rd and Johnson	Johnson is a very dangerous road for bikes and pedestrians (while heavily used by both) and my family and our neighbors would greatly benefit from the improvements this trail would bring. Please also improve the connection through Trachsel Meadows/Paula Jean to other regional trails!	2630 SW 203rd Ave, Aloha, OR 97006, USA
Safeway	Grocery Store	20535 SW Tualatin Valley Hwy, Aloha, OR 97006, USA
Safeway	Groceries	20535 SW Tualatin Valley Hwy, Aloha, OR 97006, USA
Sharon's Attic Quilt Shop	There are many people that come to the shop that do not have cars and have to wait for a friend to bring them.	2950 SE Cornelius Pass Rd, Hillsboro, OR 97123, USA
Shopping	Johnson route provides better access to shopping/stores along TV Hwy because users would not have to cross TV Hwy.	20255 SW Tualatin Valley Hwy, Aloha, OR 97006, USA
shopping	Not far from Albertsons, Bi Mart, and several restaurants and specialty shops.	6083 SW 185th Ave, Aloha, OR 97078, USA
Tualatin Hills Nature Park	There are great options for more safe walking/biking from here	Vine Maple Trail, Beaverton, OR 97006, USA
Merlo, 170 to Johnson	Johnson Alt B will make sense in connecting with the planned Beaverton Crk trail / Nature Park / LRT stop and provides a central connection off of the West Side Powerline Trail to go N and S. Johnson feels a bit less stressful as a cyclist over Blanton and Shaw.	2180 SW 170th Ave, Beaverton, OR 97006, USA
Shopping Center	Rainy Day games, classic place to grab a game or sit down and play for a bit	18075 OR-8, Aloha, OR 97007, USA
Small Local Gyro Shop	Delicious gyros and falaphel	17943 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Waterhouse Powerline to Merlo connector trail	The map doesn't show it, but there is now a nice multi-use connector trail that provides a link between the Waterhouse Powerline Trail to the north and the Merlo/Nature Park light rail station, the Powerline Trail, and the Nature Park to the south.	1455 SW 163rd Ave, Beaverton, OR 97006, USA
Starbucks	Coffeeshop	2995 SE 75th Ave, Hillsboro, OR 97123, USA

Storage	This section of road has isn't great.	3675 SW 196th Ave,
		Beaverton, OR 97007, USA
Suburban Ace	This is a very busy hardware store which I	3480 SW 185th Ave,
Hardware	visit on foot, bike, and car.	Beaverton, OR 97006, USA
Tualatin Hills Nature	Crossing 170th puts you in to the park, and	Tualatin Hills Nature Park Big
Park	at the east side of the park, offers several	Pond, 15655 SW Millikan Way,
	more bike/hike options	Beaverton, OR 97006, USA
Sushi Zen	Sushi	20265 SW Tualatin Valley Hwy,
Odsili Zeli	Gustin	Beaverton, OR 97006, USA
Target, other stores	I see a lot of wheelchairs & scooters going	2235 SE Tualatin Valley Hwy,
] 9,	down the highway towards this location. A	Hillsboro, OR 97123, USA
	trail would make them much safer. Don't	1111100010, 011 07 120, 007
	know if this far out is in the plan.	
Temple		4760 SW 160th Ave,
remple	A Vietnamese Buddhist Temple	•
		Beaverton, OR 97007, USA
Shaw & Blanton	Shaw and Blanton are both in areas zoned	17705 SW Blanton St,
routes	for more development, presenting more	Beaverton, OR 97007, USA
	future hazards and automotive traffic which	
	will affect safety of trail users significantly.	
	Also, the end toward Hillsboro does not lend	
	itself to easy connection to the core of	
	Hillsboro. If you want "South Hillsboro"	
	connected it's great but is that really a	
	destination? Perhaps better to drop a trail	
	branch to there from a more central route like	
	the one along Johnson.	
Shaw between 165th	This stretch on Shaw runs between railroad	16700 SW Shaw St, Beaverton,
and 170th	tracks and an industrial area. No heavy traffic	OR 97007, USA
and moun	on Shaw itself, but everything else you	
	wouldn't want in a trail experience noise,	
	poor shoulders, lots of vehicles parked along	
	road, and an utter absence of anything	
	resembling scenery.	
Sidewalk/path	There is an excellent piublic sidewalk across	AL4, SW Tualatin Valley Hwy,
Sidewalk/patri		
	Intel that connects Blanton with the signal	Aloha, OR 97007, USA
	that crosses TV Highway into the Alho	
UPS Store	Market Centre (Safeway)	20440 SW Tugletin Velley User
UF3 31016	A place to drop off packages	20449 SW Tualatin Valley Hwy,
Car Businesses	Fraguent truck traffic and many hypinasses	Aloha, OR 97003, USA
Car Businesses	Frequent truck traffic and many businesses	19150 SW Shaw St, Beaverton,
	raises potential for conflicts between people	OR 97007, USA
	on bikes and in trucks. Truck drivers	
	definitely feel more confident/pass more	
-	closely.	D. E. T. II D
Tualatin Hills Nature	Over the last 35 years we've seen all of our	Big Fir Trail, Beaverton, OR
Park and area	dog walking areas disappear in lieu of	97006, USA
	wetlands and "people" parks. Near the	
	nature park is one of the last places we can	
	enjoy taking our dog for a walk, but we	
	currently have to drive there, and there is	
	little parking. It would be nice if there was an	
	easier way to get there by foot.	
SW 170th & Merlo	Why stop here? Connect with/combine with	2030 SW 170th Ave,
	the SW 170th improvement project and	Beaverton, OR 97006, USA
	continue the trial along Merlo so that it	,
	connects with the west side metro trail	
		1

	(Beaverton Creek Trail?). Or take the trial south a little and cross through the THPRD Nature Park trail system to come out immediately behind the Merlo station on the MAX line.	
Tualatin Valley Water District	demonstration garden - I like to walk there during different seasons	17002 SW Berkeley Ln, Beaverton, OR 97006, USA
SW 178th AVE south of Augusta	This section of road is currently a one-lane drive with no shoulders whatsoever and a rather uneven surface. It's not very suitable for a multi-use trail in its present form.	2385 SW 178th Ave, Beaverton, OR 97006, USA
SW Banton & 185th	Very busy intersection, hard to navigate across as a pedestrian.	SW 185th & Blanton, Aloha, OR 97007, USA
TV Hwy/185th	Another dangerous and stressful intersection for peds and bikes	3675 SW 185th Ave, Beaverton, OR 97007, USA
West of 209th on Blanton Route	This portion of the work is already done and connect TV Trail to South Hillsboro Trails. More connected bike paths and savings of millions of dollars on construction needed for Shaw or Johnson options to go as far west. No brainer.	20875 SW Wyngate St, Beaverton, OR 97007, USA
Viet & Thai Market	A grocery store stocking Vietnamese and Thai produce and food ingredients.	18129 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Viet/Thai food store	great local grocery. the trail should create safer connection / better visibility to businesses in this strip.	18129 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Walgreens	A pharmacy I go to	19975 SW Tualatin Valley Hwy, Beaverton, OR 97006, USA
Wells Fargo	The local Wells Fargo branch	3435 SW 182nd Ave, Aloha, OR 97006, USA
Wetland between barricades on Johnson	If the Johnson corridor is chosen don't do all the twisty-turny stuff. Build a path/bridge connecting the two dead ends of Johnson St east and west of this break, it'll make the trail more clear/easy and avoid the need to build more trail bits running north/south to connect with SW 174th as depicted in the route map.	17309 SW Benji Ct, Beaverton, OR 97006, USA
Whispering Woods Park	Heavily wooded park with nice walking trails, picnic table, creek and bridges.	1460 SW 192nd Ave, Aloha, OR 97006, USA
willamette Dental	This is our dentist.	SW, 2929 SW 234th Ave, Hillsboro, OR 97123, USA
Johnson x Alexander	Do NOT widen Johnson. It is a neighborhood street, and as such, should only have sidewalks added. (MUP too possibly) Widening Johnson only encourages travel at more dangerous speeds. If fast travel is what you desire, go one block south to TV Highway. This is not the place to 'cut through'	20850 SW Johnson St, Beaverton, OR 97006, USA
Busy Traffice and Bad lighting	Traffic are busier than it looks here and lights are quite limited, I don't feel comfortable running, biking or walking after sunset.	3750 SW 188th Ave, Beaverton, OR 97007, USA
Willow Creek Park	A nice, quiet park with wooded trails, creek, picnic table(s), and a large sloping lawn.	19420 SW Willow Creek Ct, Beaverton, OR 97006, USA
Why the jog in the route?	Why not keep the alignment more direct and along Johnson St at this point?	2816 SW 176th Ave, Beaverton, OR 97006, USA

Westline Trail	This is a well-used trail to get to a bunch of different places.	5497 SW Village PI, Beaverton, OR 97007, USA
Westside Trail	Popular trail for biking, walking, and running	5497 SW Village PI, Beaverton, OR 97007, USA

Appendix C: Demographic Data: Zip Codes

Primary Residence Zip Codes

Zip Code	Count
97003	96
	5
97005	
97006	18
97007	35
97008	7
97023	1
97062	1
97078	68
97106	1
97113	3
97116	2
97123	22
97124	18
97133	2
97211	1
97213	1
97219	2
97223	6
97225	1
97229	7
97729	1
98005	4
97003-1860	1
97003-2130	1
97003-2157	1
97003-2745	1
97003-3151	1
97003-3869	1
97006-5441	1
97006-7716	1
97078-1787	1
	1
97078-2068	1

97078-2237	1
97124-6572	1

Work Zip Codes

Zip Code	Count
97003	21
97005	11
97006	16
97007	6
97008	7
97034	1
97035	1
97062	2
97070	1
97076	1
97078	8
97106	1
97115	1
97116	2
97123	27
97124	35
97128	1
97132	3
97133	1
97148	1
97201	2
97204	4
97205	2
97209	2
97210	3
97214	1
97216	1
97219	1
97220	1
97221	1
97222	1
97223	4
97224	4
97225	2
97229	2
97232	2
97239	2

97305	1
97333	1
98122	1
9u213	1
n/a	1

School Zip Codes

Zip Code	Count
0	1
97003	6
97005	4
97006	4
97007	7
97008	2
97078	4
97123	2
97124	2
97201	1
97229	2
97331	1
97078-2068	1
N/A	3
Na	1



Meeting Summary

TV Trail Refinement Plan Stakeholder Advisory Committee #1 August 11, 2020 | Zoom Meeting

1. Meeting Participants:

- Project Management Team (PMT): Jessica Pickul, JLA Public Involvement. Nick Gross, Susie Wright; Kittelson & Associates, Inc. (KAI). Reza Farhoodi, Dyami Valentine; Washington County. Talia Jacobson, Oregon Department of Transportation (ODOT).
- Stakeholder Advisory Committee (SAC): Sheri Wantland, Sally Reid, Carolyn McCormick, Sam Louke, Maria Caballero-Rubio, Mark Daugherty, Jeff Pazdalski, Puja Bhutani, Kari Schlosshauer, Commissioner Dick Schouten.
- Washington County Staff: Erin Wardell, Melissa De Lyser
- **2. Welcome:** Commissioner Schouten welcomed everyone and noted that there is a lot of excitement for this project and as it is at the heart of his commission district is happy to be involved.

3. Project Overview:

- Effort born out of a lot of work already complete in the area. Community desire to walk,
 roll, and bike safely in the Aloha community. Also envisioned as a larger network of
 trails with the potential to connect Portland to the Coast. A world class amenity and
 destination for visitors.
- Vision came out of a 30-year old idea of converting the rail corridor to a trail. Identified
 in Washington County Transportation System Plan (TSP), Hillsboro TSP, and Beaverton
 TSP. Recognition that the rail line is not going away anytime soon. Exploring other
 alternatives to work around that reality and identify a preferred alignment.
- Worked on existing conditions this spring. Ultimately selecting one preferred alignment. Final plan intended to be adopted by Washington County.
- Public Engagement, variety of public engagement activities. Technical advisory committee (TAC), Stakeholder advisory committee (SAC), website, online outreach, inperson events (scoped pre-COVID-19), stakeholder calls. Role of the SAC will be to advise project team and help engagement the community.

- Draft goals prepared based on planning processes to-date, as well as goals from regional active transportation plan. Surf to Turf trail, building from these goals.
 - Draft goals: Safety, Connectivity, Health/Livability, Coordination, Feasibility,
 Equity

4. Discussion: It is 2050. What does the trail mean to the community of Aloha? What are the defining characteristics of the trail?

Members shared goals for the trail and defining characteristics:

- Priority is connectivity and safety. As we continue to use alternative modes of transportation, more people are willing to do so if it is safe.
- Like to see a sense of community and connections to destinations. It would be nice to see the trail connect Tualatin Hills Nature Park, new shopping district around 185th and TV Highway. Defining characteristic is that it should not be a bike lane along TV highway. It needs to be separated. It needs to be its own trail. Springwater corridor, each crossing has a bike signal.
- Safe enough for families. Creating a sense of community for Aloha.
- Vital part of the community and transportation network. People look back and ask, how
 did we ever get by without this.
- **Connectivity to schools and businesses**, **transit** stops. One thing missing—**security**. Not explicitly mentioned under safety.

5. Discussion: Other goals and objectives that could be considered?

- **Security**. At park district we talk about a lot. Important to build into projects. A lot of trails are physically separated safe. And, different **kinds of transportation**. Power skateboards, broader mix of transportation options, scooters, e-bikes.
- Sense of community, sense of pride, identity. This trail should do that as a place to engagement in fun activities.
- Folks want to see safe, secure, multiuse detached path.
- To address pets, i.e. dogs. Amenities for dogs, and small children. Water, garbage bins, restrooms.
- Connect people who work on the site to where they live. Regional trail is good, broader outreach. Connection to other modes i.e. transit.

6. Existing Conditions & Potential Future Conditions

The project team described each alternative alignment and their personal observations while on them.

- Discussion on the TV Trail alignment:
 - How does Metro's transportation measure for the TV Highway corridor impact or factor into this project?
 - The TV Highway alignment is very constrained by the railroad. The rail right-ofway is up to the back edge of pavement. The Metro transportation measure will provide enhanced bicycle facilities but still need for separated path.
 - Just a note, amazing the difference of quality with noise and quality between
 Shaw or Alexander compared to TV Highway. Perhaps it is not one street versus
 the other. Maybe it is a combination of multiple streets.
 - Goals and objectives. Challenging to look at eliminating alternatives when we are focused on existing conditions. We are not looking at equity and demographics as we are narrowing.
- a. Additional comments added through the chat feature:
 - Population density, in addition to demographics. Thanks!
 - Future density, town center development.
 - Was there a study to see how many residential homes are impacted with the trail on each of these alternate routes?
 - Are there any issues to consider on Shaw at the crossing of 185th? Specifically, with the proximity to TV Hwy and the potential for traffic to back up on 185th from TV Hwy south past Shaw?
 - Johnson is heavily traveled during "normal" day to day driving situations with school in session.
 - o I also like Sam's suggestion of the Shaw/Blanton combo.
 - It would be a good exercise for each committee member to drive the 3 proposed for a better understanding of the connectivity, safety, scene, etc.
 - Let's bike "the 3 proposed for a better understanding....

7. Selection of Three Alignment Alternatives

The project team described that there is a two-tiered screening process approach. The first is a higher-level screening which we hope to get from 5 corridors down to 3. The next level of analysis includes a detailed analysis looking at things like demographics, equity, access to schools, etc.

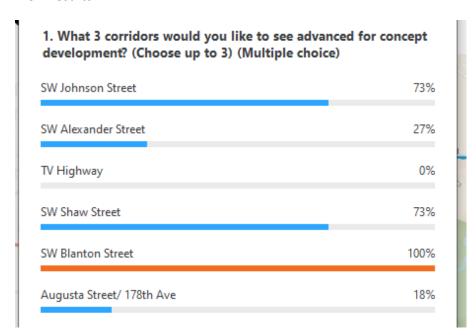
Discussion:

- Did you do any study of Johnson when it crosses Cornelius Pass Road? It continues as an easy jog to Drake Street.
- We have representation from Hillsboro on the TAC. That connection is west of our scope but we have Hillsboro on the team to think critically about those pieces.
- To summarize, the team suggesting that we screen out the Alexander and TV Highway alignment alternatives.
- I like idea of keeping close to highway and town center. I see Blanton and Shaw as a good combination.

8. SAC Poll: What Three Corridors Should Be Advanced?

The SAC members were asked to respond to a poll on which three corridors should be advanced for further analysis. The poll was not a formal vote but meant to demonstrate how the committee was leaning.

Poll Results:



Discussion:

- I like a Shaw and Blanton combination.
- Look at combination of segments to complete the full trail.
- Based on work with nature and trails committee. Road crossings for the trail.
 Major road crossings will be a problem and limiting or steer away from major roadway crossings.
- Safety, security, I want to look at Blanton in further detail.
- As you get into the Tier 2 evaluation, it would be great to see destinations, heat maps of demographics, densities, locations to help inform which corridor is closest to people and the places people travel to.
- There are issues around 170th and 185th. All the options that made the cut will be viable. A little concerned with Shaw and the proximity to the TV Highway.
 People may try crossing not at the intersections and there are currently some hazardous crossing and walking conditions, including some grass lands.
- May be interesting to overlay a crime map. Consider security and crime and options to minimize risk.
- I like Blanton, it's far away enough to create separation and it's also closer to the neighborhoods. Same for Johnson. Both are close enough to the bus and also far enough from the highway.
- I really like the Shaw Blanton combination. Needs some safety improvements.
- Not much more to add, always liked Alexander. I support the technical folks' points to greater connectivity.
- Additional comments added through the chat feature:
 - Blanton, Shaw and Johnson are my selections because of the proximity to TV Hwy and bus line. Also far enough from TV Hwy to be in the community.
- **9. Next Steps:** Our next step is to begin the Tier 2 refinement with the three preferred alignment alternatives. Based on the feedback, we heard that the group's preference is to advance Johnson, Blanton, and Shaw for the next round of review. The next SAC meeting is anticipated for October. Thank you everyone for attending and participating in the discussion tonight.
 - Comments added through the chat feature:
 - Thanks for the great discussion.

- Thank you all for what you are doing for Aloha's Community
- Thank you for having this session!
- o Excellent, thanks!



Stakeholder Advisory Committee #2 October 29, 2020 | Zoom Meeting

1. Meeting Participants:

- Project Management Team (PMT): Jessica Pickul, JLA Public Involvement. Nick Gross, Susie Wright; Kittelson & Associates, Inc. (KAI). Reza Farhoodi, Dyami Valentine; Washington County.
- Stakeholder Advisory Committee (SAC): Carolyn McCormick, Sam Louke, Maria Caballero-Rubio, Mark Daugherty, Jeff Pazdalski, Kari Schlosshauer, Commissioner Dick Schouten, Marni Kuyl, Sam Scheerens
- Washington County Staff: Erin Wardell, Melissa De Lyser
- **2. Welcome:** Commissioner Dick Schouten welcomed everyone and noted that there is a lot of excitement for this project and that it will have a large, positive impact on Aloha.

3. Project Schedule and Outreach Update:

- Based on the screening evaluation and feedback from this group, the project team narrowed down five corridors to three for a more detailed evaluation on potential cross sections types, the crossings of major roadways, and intersection treatments.
- The goal for this meeting is to get feedback from the SAC on the evaluation and narrow the three corridors down to one. Then, the project team will develop a conceptual design for the corridor. The SAC is scheduled to meet twice between now and the end of June.
- The project is running slightly behind schedule, in large part due to COVID-19. The election delayed public engagement activities.
- The online open house will run from November 13th through December 11th and will
 collect feedback from the community on the desired trail experience, cross-sections,
 and the corridor recommendations. It will be available in English and Spanish.
- There will also be a Spanish language focus group promoted via social media, hosted by Centro Cultural.

4. Alignment Comparisons, Cross Section Alternatives & Intersection Treatments

- **Brief recap:** Alexander Street and TV Highway were taken off the list of potential alignments because the former lacked continuity and the later was too close to the highway and had noise and safety concerns.
- Project team presented the segment matrix for each alignment and the comparative evaluation approach and findings.

a. SW Johnson Street

- **Right-of-Way (ROW):** Existing ROW is mostly 60 feet, give or take 5-10 feet at some points.
- **Challenges:** Lots of residential lots and driveways, some informal on-street parking.
- **Recommended cross sections**: Cross-section with a trail on one side. One with landscaping and one with parking. Also developed cross sections for the intersections. Other cross sections were considered but ultimately dismissed largely due to residential impacts.

• Discussion:

- Inquiry regarding designing to 60-ft ROW versus the 74-foot cross section allowed under TSP designation. Complete streets cross sections are still an option, but the project team is recommending a 60-ft. cross section due to cost and potential impacts to residential properties.
- A member expressed a desire to see good connectivity to the
 Beaverton Creek Trail, via Augusta Lane or Pheasant Lane area and
 Aloha town center. It was also noted that the east end of the corridor
 runs straight into the Tualatin Hills Natural Park and is not a good option
 because it's so busy on SW 170th Ave, which does not have a decent
 bike lane right now.
- A member expressed an interest in avoiding frequent shifting between cross section types along a corridor as it may cause confusion, noting the more consistent it can be the better.
- It was noted that **178**th **Ave is a quiet street** and may be a good alternative to **170**th Ave.
- A member asked about considering a multi-use path on both sides
 without having an at grade bike lane as demonstrated in cross section.

b. SW Shaw Street

- **Right-of-Way (ROW):** Existing ROW is ~50-feet. The two recommended cross sections are 40 and 50-feet.
- Challenges and Benefits:
- Proximity to TV highway is both a pro and a con (closer to transit).
- Better access to land uses along TV Highway.
- The signals at key intersections (185th, 170th, 198th) create queuing for northbound vehicles.
- Railroad crossing considerations (which has a ROW off set).
- A bit narrow, and less residential.
- The trail will be on north side of street and has no land uses, which would contribute to driveway access issues.

Recommended cross sections:

- Regional trail on one side of the road as well as shared road markings between cyclists and vehicles.
- 40' cross section does not include sidewalk and landscape buffer on south side of the road.
- Intersections: Main consideration is proximity of SW Shaw to TV Hwy, major crossings and signals, and the railroad.

Recommendations:

- Rapid flashing beacon at crossings (similar to Johnson)
- Pedestrian-half signal at intersections in close proximity to TV
 Highway to provide a full protected crossing (this would have to be
 coordinated with railroad as well as signals along TV Highway).

Discussion:

- A member asked about how this alignment would connect to the Powerline Trail. The SW Shaw St Alt A would jog south to SW Blanton St. There is an assumption there that the trail would connect into the south Hillsboro area. On the east side, the trail would connect to the Powerline Trail (Westside Trail) at Blanton and across TV Highway. A project team member noted that by connecting to Westside Trail at 160th at Shaw or Blanton could improve connectivity across TV Highway to Milikan Way. The trail might connect to Beaverton via 160th. Connectivity is a key consideration. There may also be an opportunity to connect to the Beaverton Creek Trail (to the north on the east side). There was also discussion about the trail connecting to South Hillsboro.
- Several members mentioned that SW Shaw street isn't that pleasant of a street to ride on, it feels like an industrial area. SW Johnson and SW Blanton are more pleasant places. The project team also noted that having residential on each side of a trail presents more traffic and land use conflicts.
- Several members expressed concerns about the crossings and the intersection at 185th, their proximity to TV Highway, and traffic backups. One noted that there are too many traffic controls. The project team agreed that these are large concerns for this alignment.

c. SW Blanton Street

- **ROW:** Existing ROW varies between 50-60 feet along the corridor. Allocated TSP of 74 feet.
- Scores the most strongly on equity because it is in proximity to underserved communities.
- **Challenges:** Scores the worst on safety. Specifically, jogging maneuvers of 198th and 185th, which involve a 2-stage turn for bicyclists and crossing 3+

travel lanes, are a concern. Need to provide an enhanced or protected crossing at these locations. This is a residential street and has a balance of driveways on each side of street.

• **Recommend cross section:** Complete street 60-foot cross section with a bike lane and sidewalk on both sides of the street.

• Discussion:

- A member said that they like this alignment the best, especially on the west end and how it ties into the way the streets are already built out. There is better access to westside trail than the SW Shaw St alignment and it gives access to parks and schools. Other members agreed.
- A member asked if there is a chance that some of these offset intersections could be straightened out? Project team said that this is being explored.
- One member mentioned that by addressing the safety concerns mentioned, there is an opportunity to improve current safety issues.
- A member raised the point that how TV Trail connects into the rest of the community and regional infrastructure could be a key evaluation point. Coordinated lights at 185th and 198th (for all corridors) could improve crossing safety.

2. Corridor Evaluations & Recommendations

- Nick reviewed the feedback received from the Technical Advisory Committee (TAC) on the corridors:
 - Need to explore protected intersection treatments.
 - SW Johnson street suggested as one-way cycle tracks both sides "complete street", which is in alignment with the feedback received tonight.
 - SW Shaw Street preferred, must determine feasibility of pedestrian signals in proximity to TV Highway signals.
- Susie shared the evaluation matrices for all corridors together so that we could see
 the evaluations for each corridor next to each other. The comparison matrix
 evaluates each corridor in relation to the others and leads the project team to
 recommend the alternatives south of TV Highway: SW Blanton Street and SW
 Shaw.

SW Shaw and SW Blanton

1. **SW Shaw Street** – North side has no driveways; good opportunity for a direct route without driveways; does have significant concerns regarding crossings; the project team will continue to explore crossings that are direct at SW Shaw Street (tied into TV Hwy signal controllers).

SW Blanton Street – Challenges related to improving the crossings in general
(a lot do not have signals today) and the need for new infrastructure and
pedestrian signals to support this alternative. This alternative has more
traffic volumes than SW Shaw. The planning cost is higher than SW Shaw due
to wider footprint and need for ROW.

Initial recommendation is for SW Shaw Street, but ultimate decision will depend on feasibility and ability to implement convenient and safe crossings. If proximity to TV Highway and the railroad makes SW Shaw unfeasible, the next approach would be to focus on SW Blanton instead.

- 3. Discussion: Is there anything else that we should consider with the evaluation?
 - There were questions about the "Destinations" evaluation criteria and a comment that SW Shaw street is picking up a lot of destinations along TV Highway.
 - A member asked if **Alt B on Shaw is moving forward.** The project team responded that Alt A is mov-ing forward.
 - A member asked if focus groups have been completed and said that we should
 consider the destinations that people in the area want to get to, not destinations
 that this group like. Jessica, of JLA, shared that we will present the information
 reviewed tonight in online open house and that community members who will be
 impacted by the trail will be invited to participate.
 - Poll Question: Do you agree with the project team's recommendation?
 - Results: 6 Yes; 1 Yes but with some changes; 1 Another corridor makes more sense; 1 – Unsure
 - Many members noted that they would like to hear from people living in the area think about the alternatives.
 - Someone mentioned that they do not like that SW Shaw goes around Intel.
 - Several members do not like the jogs along SW Shaw.
 - Several members believe that SW Shaw could benefit the most from becoming the alignment for TV Trail and would make the area nicer.
 - One member said that they feel SW Blanton is more friendly and is closer to parks and schools, which they like.
 - There were concerns about the difficulty of the crossings along SW Shaw, as well as the 185th crosswalk and railroad.
 - A member said that they like that SW Shaw is close to transit and that there are less driveways to work around. Concern about.
 - Someone said that while they favor the SW Blanton alignment, they still believe that SW Shaw would work well.
- **4. Next Steps:** This information will be shared with the community via an online survey and online open house. The team will refine the recommendation and address the comments received. The SAC will reconvene in January.

 There was a question about whether TAC weighed-in on the alternatives along SW Shaw. They have not.



Stakeholder Advisory Committee #3 April 26, 2021 | Zoom Meeting

1. Meeting Participants:

- Project Management Team (PMT): Reza Farhoodi, Dyami Valentine; Washington
 County. Nick Gross, Susie Wright, Sophia Semensky; Kittelson & Associates, Inc. (KAI).
 Jessica Pickul, Nicole Metildi; JLA Public Involvement.
- Stakeholder Advisory Committee (SAC): Carolyn McCormick, Sam Louke, Maria Caballero-Rubio, Jeff Pazdalski, Kari Schlosshauer, Former Commissioner Dick Schouten, Marni Kuyl, Commissioner Nafisa Fai, Sally Reid, Sheri Wantland
- **2. Welcome:** Dick Schouten, Stakeholder Advisory Committee Chair, welcomed everyone. There was a guick round of introductions. Commissioner Fai also introduced herself.

3. Project Schedule and Outreach Update:

- Jessica provided an overview of the project timeline and work done to date.
- Since the committee last met, the project team has conducted public outreach through an online open house and focus groups:
 - In the Fall 2020 online open house, people favored SW Shaw Street and SW Blanton Street over SW Johnson Street for the TV Trail. Of those two, people favored Blanton slightly more than Shaw. People were most concerned about safe crossings, connections to businesses and community destinations, and having a pleasant environment for cycling and walking along the future TV Trail.
 - At the Spanish Language Focus Group, people expressed preference for SW Blanton because it will serve the communities south of TV Highway and because it was further way from the railroad than SW Shaw.
- Susie provided an overview of the two alignments (SW Shaw Street and SW Blanton Street) and their overarching challenges. Overall, the project team is recommending SW Blanton as the preferred corridor for TV Trail.

4. Shaw Street Overview

- Susie presented the preferred cross-section for Shaw Street and provided a visualization of the corridor with the cross-section.
- Nick went over the crosswalk assessment. While half-signals are needed at major crossings (185th, 170th, 160th), challenges with technical feasibility, coordination with the railroad and TV highway, and costs make it difficult to implement them. Thus, crossing at TV Highway is recommended if this corridor is chosen for the TV Trail.
- Even if SW Shaw is not chosen as the preferred corridor for TV Trail, the project team still recommends that improvements be made along SW Shaw to enhance local access to businesses and transit.

Discussion:

A member asked about the 30-foot distance between the railroad and the trail.
 The County does have some right of way (ROW) in that 30-foot space but acquiring permits within that space is challenging and could require fencing requirements for the trail.

 There was a question about ROW acquisitions, what the typical dimensions of frontage are, and what the associated costs are. This varies throughout the corridor. The east end might need 10-12 feet, while further west it might just be a few feet. This could be refined during the final design phase.

- How does creating protected half-signal crossings along SW Shaw Street impact the cost of the project? The project team responded that this is hard to determine but could be in the range of \$3-6 million.
- It was noted that community groups preferred SW Blanton.
- The project team clarified that the County could pursue the improvements to SW Shaw Street in the future if SW Blanton Street moves forward as the preferred corridor.
- The project team confirmed that half-signals would be considered if SW Shaw Street is chosen as the preferred corridor.

5. Blanton Street Overview

- Susie presented the preferred cross-section for SW Blanton Street and provided a
 visualization of the corridor with the cross-section. This cross-section is more of a
 "complete street" and would create a low stress environment for people walking and
 biking. There will be directional bike lanes on either side of the street to reduce conflicts
 with driveways.
- The existing corridor generally has a 55' ROW. The draft concept plan for Blanton includes 60' for ROW (with some variation throughout the corridor), which is less than the suggested 74' ROW in the current Transportation System Plan for the County. While a 60' ROW would impact 160+ properties, impacts should be minimal on property owners.
- Nick reviewed the crosswalk assessment. Half-signals are recommended at all intersections. At the off-set intersections of SW 185th Avenue and SW 198th Avenue, a shared-use path will be provided on one side of the street to accommodate travel between the trail legs.
- Nick presented the left-turn lane operational assessment. Left-turn lanes could be added at major intersections; however, because the intersections are not signalized, left-turn lanes would still result in queuing and spillback. Therefore, they are not recommended.
- Nick discussed the current construction of SW 198th Avenue, which does not include realignment.
- Nick presented three alternatives for the realignment of and adding a traffic signal at SW 185th Avenue. As this option would be costly, require major ROW acquisition, and could incentivize vehicular traffic on SW Blanton Street, so adding a signal at this location is not recommended.
- Nick discussed additional design constraints, including pedestrian scale lighting, natural resource enhancements, protected intersection treatments, and raised side street crossings.

Questions:

- How is truck traffic considered and how might it impact lane widths on the corridor? Susie replied that this, along with fire access, are still issues the team needs to consider.
- When is the trail expected to be built and will on-street parking be needed? The
 project team responded that the trail could be built incrementally over next 20

years or programmed as part of a capital project as funding becomes available. More multi-family housing is expected to be built along SW Blanton, potentially creating a need for on-street parking.

6. Discussion

Poll: Should SW Blanton Street be advanced as the trail corridor? -> 80% responded yes

1. Should Blanton Street be advanced as the trail corridor? (Multiple choice)



- The project team asked all SAC members to comment on how they responded to the
 poll and what they think about on-street parking, intersections, and cross-sections for
 each of the corridors. Below is a summary of the feedback.
 - Overall, most members agreed that SW Blanton Street should be advanced as the trail corridor for the following reasons:
 - More community destinations along Blanton.
 - Community groups and members expressed a preference for Blanton.
 - Shaw Street has several challenging crossings, which create safety concerns.
 - The jogs along Shaw Street are not conducive to a regional trail.
 - One member said that they thought it would be less disruptive to stick with SW Shaw Street due to the lack of driveway conflicts. They also think that the project team should explore different and better ways to create protected crossings (instead of the half-signals).
 - Several members mentioned that parking should be provided on Blanton where it makes the most sense. One member suggested that the corridor be assessed block by block to determine which blocks need parking and which do not, and how parking could be treated on each block. Members brought up other ideas as well:
 - Parking could be on one side of the street.
 - Parking could take the place of a landscaped buffer between cyclists and cars.
 - A few members expressed a desire to prioritize bike/pedestrian safety over onstreet parking.
 - Members expressed concerns about property acquisition and the number of driveways along Blanton, which could lead to project delays. There was also concern that driveways along Blanton could present safety issues, especially for kids walking or biking to school in the morning.
 - Members had the following feedback related to cross-section width:
 - Some expressed interest in the 60' treatments presented.

Support for the project team to consider 11' or 10.5' auto lanes to provide more space for on-street parking and/or the trail. This might also help decrease conflicts with private property along the trail and cause natural slowing of vehicles.

- The County might consider opportunities to widen the street through property redevelopment.
- Several members supported the recommendation to restrict left turn lanes at major intersections or realignments as they would increase vehicle traffic.
- Support for a 10' shared use path connections from Blanton to TV Highway on all major north-south streets.
- A few members mentioned that they would like to see the County consider the improvements that the project team outlined for SW Shaw Street, even if it is not chosen as the preferred corridor.

7. Next Steps

- Dyami noted that the final TAC/SAC meetings will be held in early June. Between now and then, the project team will advance the draft concept plan, conduct public outreach in May with an online open house, and work to finalize a concept plan by mid-June. A work session will be held with the Board of County Commissioners in early-June.
- Jessica clarified we will also have tabling events along the Blanton street corridor (outside) in mid-late May for the public to learn more about the project.



Stakeholder Advisory Committee Meeting #4 June 10, 2021 | Microsoft Teams Meeting

1. Meeting Participants:

- Project Management Team (PMT): Nick Gross, Susie Wright; Kittelson & Associates, Inc.
 (KAI). Reza Farhoodi, Dyami Valentine; Washington County. Jessica Pickul, Ariella
 Frishberg; JLA Public Involvement (JLA)
- Stakeholder Advisory Committee (SAC): Committee Chair Dick Schouten (former County Commissioner District 1), Sally Reid (Aloha Business Association), Sam Louke (CPO 6), Jeff Pazdalski (Westside Transportation Alliance), Kari Schlosshauer (Safe Routes Partnership), Sheri Wantland (THPRD Nature and Trails Advisory Committee Chair), Nafisa Fai (Commissioner District 1), Mark Daugherty (Intel Aloha Campus Facilities Manager)

2. Introductions:

 Jessica kicked off the meeting and welcomed the SAC to the fourth and final SAC meeting. Dick Schouten, SAC chair, thanked SAC members for participating in the process. Commissioner Fai also welcomed the group and thanked them for their participation on the committee. There was a quick round of introductions, and members provided input on whether they would like to meet in person or continue online with future advisory meetings.

3. Project Schedule:

• Susie provided an overview of the project schedule. The project contractual end date is June 18, 2021, all work must be completed by this time.

4. In-person & Online Open House:

- Jessica summarized the in-person outreach activities conducted along Blanton, and findings from the second online open house. The online open house provided in English and Spanish; 123 people participated, all in English.
- Overall feedback showed a slight preference for Blanton Street improvements.
- Key feedback themes: Safety and security are important; Concerns about parking, property impacts and crossing at the railroad tracks.

5. Since we last met:

• Susie provided an update on the refinement to the SW Shaw Street crossing treatments and concept design. Blanton Street is being considered as an opportunity for near-term

improvements; Shaw Street is being considered as an opportunity for long-term improvements.

- 185th recommendation half signal; additional work to improve the railroad crossing.
- $\,\circ\,$ 170 th recommendation to clean up and combine crossings of Shaw and TV Highway.
- 160th no enhanced crossing. Rerouting users to Blanton to cross at proposed half signal.
- There was a question seeking clarification on what a half-signal looks like.
 - Susie noted that half signals have typical signal heads with red, yellow and green and provide red stop indications to vehicles and provide pedestrians a protected walk phase and don't walk signs.

6. Concept Plan

 Nick walked the SAC through the concept plan, providing a brief overview of each section.

Comments and Questions:

- A member noted that Shaw is going to be challenging due to the required railroad coordination. Another member agreed with this comment.
- Question regarding who makes the final decision on selecting the preferred alignment?
 - Dyami responded that the decision will be up to the Board of County Commissioners. The strategy is a near-term solution for Blanton and a long-term vision for Shaw.

7. Breakout Groups

SAC members were broken out into small groups to discuss the draft Concept Plan and what was included.

- The following are key themes from the breakout group discussions:
 - Concerns about the impacts of the project to property owners and the tradeoffs. Opportunities for traffic calming on Blanton. Shaw has connections to TV Highway; Blanton is only one block further. If Blanton is selected, wider paths north-south to connect to TV Highway must be included.
 - There's an opportunity to have additional coordination with Intel employees and get their input on the trail.
 - o There is a need to make safety improvements on both alignments.
 - o There is value in advancing both corridors: near- and long-term improvements.
 - Members encouraged the project team to explore opportunities for a hybrid of the two alignments.

Concerns with proximity of trail to TV Highway and crossing at the intersections.
 Intersections are already hard to drive, and we are looking at adding more to busy locations.

- **8. Implementation:** Dyami presented the implementation process for the trail alignment.
 - The adoption process involves approval through the Washington County Board of Commissioners to amend the Washington County TSP. Then, the County will seek funding opportunities to implement segments or portions of the trail, such as regional flexible funds and the major streets transportation improvement program.
- **9. Next Steps:** Dyami provided a brief summary of next steps.
 - Comments on the draft Concept Plan are due by Tuesday, June 15





Plan Conceptual del Sendero Regional del Valle de Tualatin



Two Potential Routes Dos rutas potenciales



What is it?

- An alternative to TV Highway that feels comfortable for all ages and abilities to walk, roll and bike.
- A connection to other regional Trails.

¿Qué es?

- Una alternativa a TV Highway que se siente cómoda para todas las edades y habilidades para caminar, rodar y andar en bicicleta.
- Una conexión a otros senderos regionales.

Scan me to go to our online open house!



¡Escanee para ir a nuestra jornada de puertas abiertas en línea!





Plan Conceptual del Sendero Regional del Valle de Tualatin



Blanton Corridor Corredor Blanton

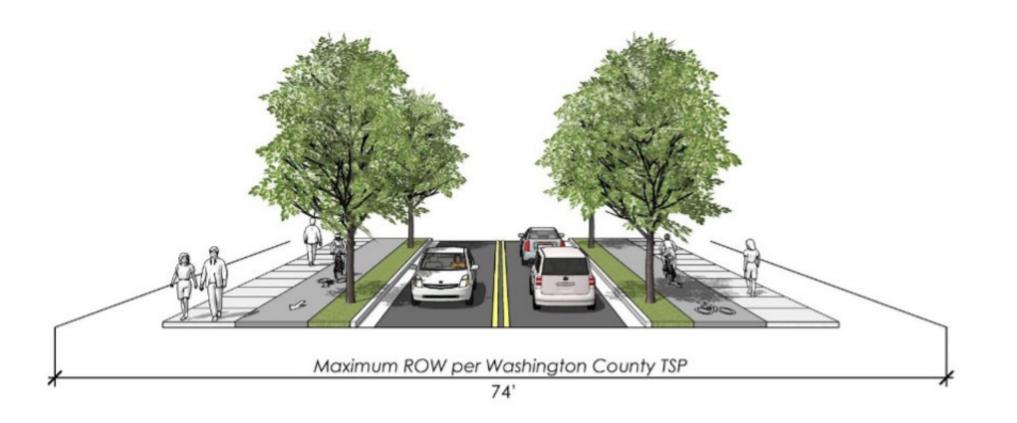


Considering the tradeoff between property impacts and comfort level for people using the trail, which cross-section would you prefer to see on most of the corridor? (Place a sticker next to your answer.)

Teniendo en cuenta la compensación entre los impactos en la propiedad y el nivel de comodidad para las personas que usan el sendero, ¿qué sección transversal preferiría ver en la mayor parte del corredor? (Coloque una calcomanía junto a su respuesta).

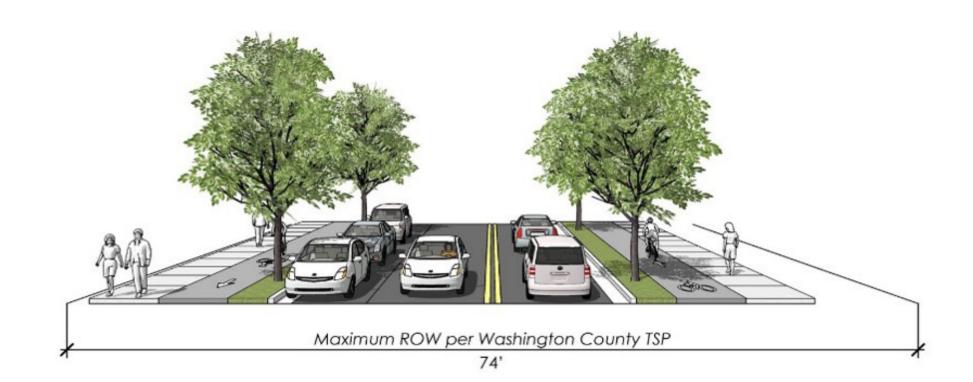
Typical Cross-section

Sección Transversal



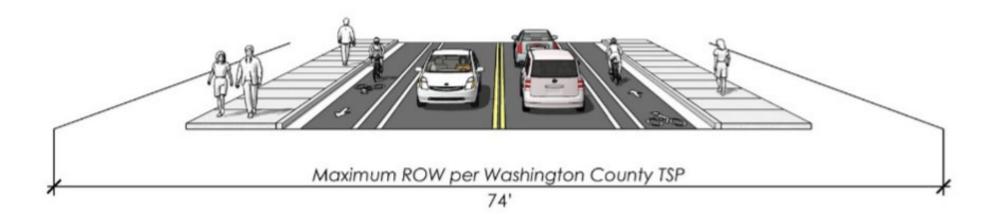
Cross-Section with Parking on One Side

Estacionamiento en un lado Sección transversal



Narrower Cross-Section

Sección transversal estrecha



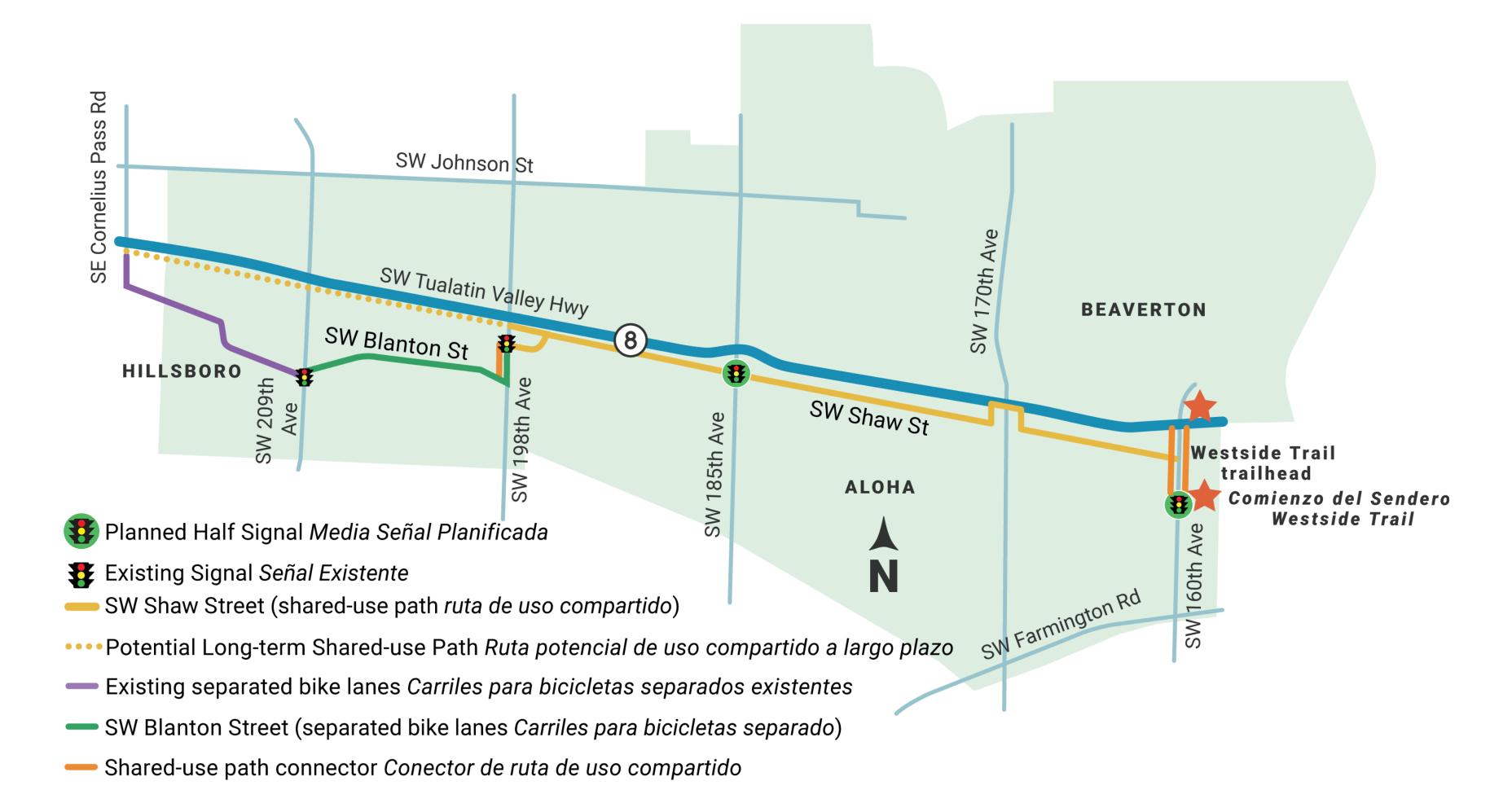


Plan Conceptual del Sendero Regional del Valle de Tualatin



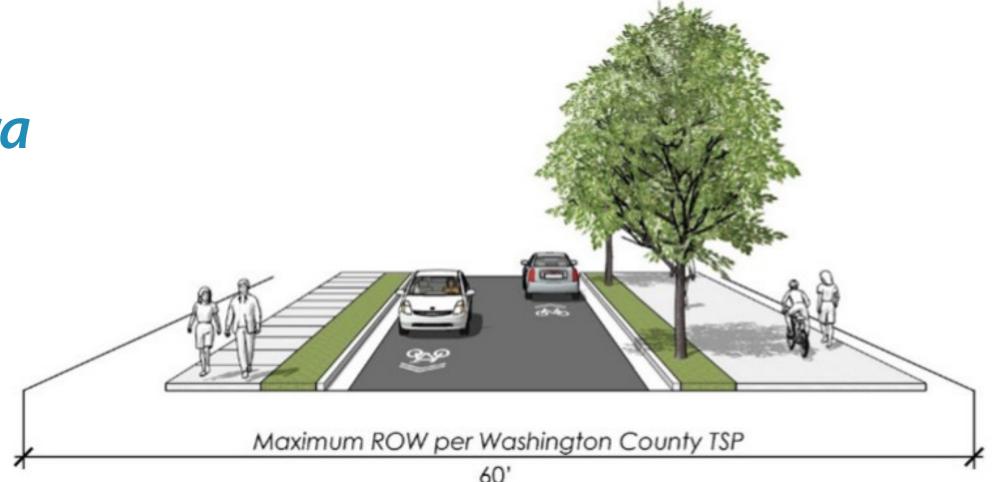
Shaw Corridor

Corredor Shaw



Typical Cross-section

Sección Transversal Típica



Do you think the cross-section will provide a comfortable way to travel along TV Trail? (Place a sticker next to your answer.)

¿Cree que la sección transversal proporcionará una forma cómoda de viajar a lo largo de TV Trail? (Coloque una calcomanía junto a su respuesta).

Yes Sí No No



Plan Conceptual del Sendero Regional del Valle de Tualatin

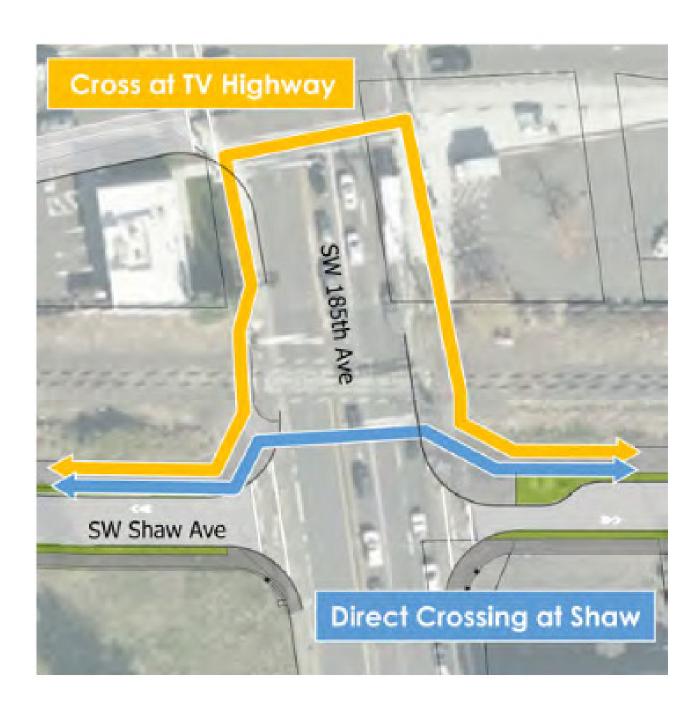


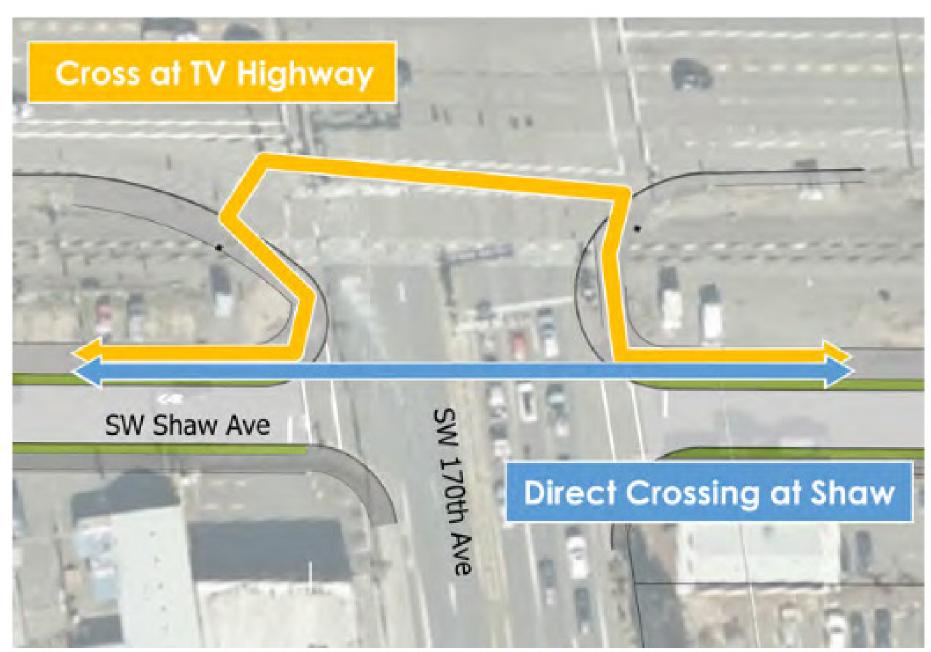
Major Street Crossings

Building direct crossings at Shaw Street will be challenging due to proximity to the railroad. If not feasible, people would need to cross the railroad tracks and use the existing crosswalks at TV Highway.

Cruces de calles principales

La construcción de cruces directos en Shaw Street será un desafío debido a la proximidad al ferrocarril. Si no es posible, las personas tendrían que cruzar las vías del tren y usar los cruces peatonales existentes en TV Highway.







Would you use a trail on SW Shaw Street if you had to cross the railroad tracks to use crosswalks at TV Highway instead of crossing directly at Shaw? (Place a sticker next to your answer.)

Yes Sí

¿Usaría un sendero en SW Shaw Street si tuviera que cruzar las vías del tren para usar los cruces de peatones en TV Highway en lugar de cruzar directamente en Shaw? (Coloque una calcomanía junto a su respuesta).

No No



Plan Conceptual del Sendero Regional del Valle de Tualatin

Which corridor do you think you would feel more comfortable biking, rolling or walking along?

Review this overview and place a bouncy ball in the bucket for the corridor you would feel the most comfortable using. ¿En qué pasillo crees que te sentirías más cómodo andando en bicicleta, rodando o caminando?

Revise esta descripción general y coloque una pelota que rebota en el balde para el pasillo que le resulte más cómodo usar.



Shaw Corridor Corredor Shaw

Pros A favor

- Designed like a regional trail parallel to the street.

 Diseñado como un sendero regional paralelo a la calle.
- Intended to be accessible, comfortable for all ages and abilities. Diseñado para ser accesible, cómodo para todas las edades y habilidades.
- Close to TV Highway businesses and transit. Cerca de las empresas y el tránsito de TV Highway.
- Fewer conflicts between driveways and people walking, biking and rolling. *Menos conflictos entre los caminos de entrada y las personas que caminan, andan en bicicleta y ruedan*

Cons Contra

- Direct crossings of major streets may be expensive and difficult to construct. People may need to cross the railroad tracks and use crosswalks at the TV Highway intersections. Los cruces directos de las calles principales pueden ser costosos y difíciles de construir. Es posible que las personas deban cruzar las vías del tren y utilizar los cruces peatonales en las intersecciones de la autopista TV.
- Fewer community destinations for people walking, biking and rolling on Shaw Street. *Menos destinos comunitarios para personas que caminan, andan en bicicleta y ruedan en Shaw Street*.

Blanton Corridor Corredor Blanton

Pros A favor

- Designed like a "complete street" providing bike lanes separate from sidewalks. *Diseñado como una "calle completa" que proporciona carriles para bicicletas separados de las aceras.*
- Intended to be accessible and comfortable for all ages and abilities. *Diseñado para ser accesible y cómodo para todas las edades y habilidades*.
- Close to neighborhoods, schools and parks. Cerca de vecindarios, escuelas y parques.
- More people walk, bike, and roll on Blanton today.

 Actualmente, más personas caminan, andan en bicicleta y ruedan en Blanton.

Cons Contra

- May have more property impacts.

 Puede tener más impactos en la propiedad.
- Many driveways potentially creating conflicts between people biking and cars entering/exiting driveways.

 Muchos caminos de entrada pueden crear conflictos entre personas que andan en bicicleta y automóviles que entran o salen de los caminos de acceso.
- Not designed like a regional trail.
 No diseñado como un sendero regional.
- Not as convenient to TV Highway businesses and transit. service. *No es tan conveniente para las empresas de TV Highway y el servicio de tránsito*.

Respond below with a ball! ¡Responde a continuación con una pelota!



Plan Conceptual del Sendero Regional del Valle de Tualatin

Please wear a mask Por favor use una mascara

We are following CDC—recommended guidelines to protect you and our staff from COVID-19.

Please wear a mask and maintain 6 feet of distance between yourself and people not in your household.

Estamos siguiendo las pautas recomendadas por los CDC para protegerlo a usted y a nuestro personal del COVID-19.

Use una máscara y mantenga una distancia de 6 pies entre usted y las personas que no sean de su hogar.



This is a touch-free area.

Esta es un área sin contacto.



To participate, enter the tent one person or household at a time.

Para participar, ingrese a la carpa una persona u hogar en un momento.



Once in the tent, sign-in using the QR code.

Una vez en la tienda, inicie sesión con el código QR.



Give feedback by speaking with staff, filling out a questionnaire, scanning the open house QR code, or placing stickers on the displays!

Envíe sus comentarios hablando con el personal, llenando un cuestionario, escaneando el código QR de la jornada de puertas abiertas o colocando pegatinas en las pantallas.

Scan me to go to our online open house!



¡Escanee para ir a nuestra jornada de puertas abiertas en línea!



Tualatin Valley Trail Refinement Plan

Spring 2021 Outreach and Engagement Summary



Prepared for:

Washington County
ODOT
Kittelson & Associates, Inc.

Prepared by

JLA Public Involvement, Inc.

June 2021

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Introduction

Washington County and ODOT conducted an online open house between May 20 and June 7, 2021, to give the public an update about the project, share public feedback received so far, and solicit feedback from the community on the two corridors being considered for the Tualatin Valley (TV) Trail. Feedback received through this outreach period will be considered as Washington County identifies next steps for identifying a trail alignment.

Overall Participation and Notification

To gather feedback on the two corridors being considered for TV Trail, the project team developed an **online open house** and hosted **two in-person tabling events**.

Two language options were made available for the online open house: English and Spanish. Additionally, Spanish language interpretation was made available at the tabling events and all materials were provided in English and Spanish.

Overall, **143 people participated** in the Spring 2021 outreach efforts: 123 in the English-language version of the online open house and 20 through the tabling events. Four of the 20 people at the tabling events were Spanish-speakers. No one submitted feedback through the Spanish-language open house.

While a few Spanish-speakers were engaged through public outreach efforts, the Project Team recognizes that there is a gap in input and a need to seek additional input from Spanish-speaking community members in the project area.

Community members were informed about the online open house through the following:

- Bilingual postcards mailed to over 12,000 residents in the project area
- Social media posts to the Washington County Facebook page, Twitter, and Nextdoor
- Updates on the County project websites (English and Spanish websites)
- Media release to local media outlets
- County e-newsletters (sent via email)

Community members were **informed about the in-person tabling events** through posts on the project webpage and through mailed postcards.

Feedback Summary

Online Open House Responses

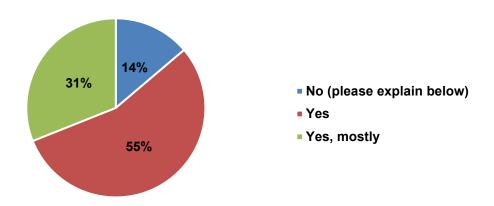
Participants from the online open house were given the opportunity to respond to a series of questions to review and give feedback on aspects of the two corridors being considered for the TV Trail Concept Plan.

Feedback is summarized below.

Note: Unless otherwise stated, the percentages listed in the analysis of each question take into consideration the number of participants who responded to the question, not the total number of people who participated in the online open house.

1. Do you think the proposed cross-sections for Blanton are accessible and comfortable for all ages and abilities? (Check one.)

Of the 116 people who responded to this question, the **majority of respondents (86%) agreed** that the proposed cross-sections were accessible and comfortable.

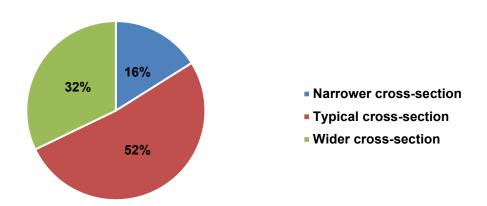


Participants were given the option to share more about their answer. Below is a summary of the 49 comments received through the open text box. Review all individual comments in Appendix A.

- Many would like to see improvements to sidewalks on SW Blanton St.
- Many expressed overall excitement for the eventual completion of TV Trail.
- There was a strong preference for typical or wider cross-section as separated
 multi-use paths are perceived as safer, more comfortable, and accessible. Many said
 they do not like the narrower cross-section as there is not enough separation
 between the road and pedestrians and bicyclists and that it would not be safe for
 children.
- Many people were concerned about:
 - The trail encroaching on private property.
 - Access to driveways and potential conflicts between drivers and children.
 - Adequate **street parking** being provided for residents (whether on Blanton or side streets).
- Many were concerned about safety on SW Blanton St, in particular respondents were concerned about speeding vehicles and the safety risks with children crossing the street and nearby bicyclists.

- People would like **bike lanes to be as straight as possible** and constructed out of smooth asphalt.
- Some expressed concern that SW Blanton is very narrow and crowded and would not be a good option for TV Trail.
- People mentioned the following, **general concerns about SW Blanton**:
 - There needs to be better traffic signal detection to detect bicyclists
 - o It is hard to see people crossing the street at night
 - Trees might create hazards for bicyclists when they drop leaves or branches on the bike lane
- 2. Considering the tradeoff between property impacts and comfort level for people walking, biking and rolling, which cross-section would you prefer to see on most of the corridor? (Check one.)

Of the 112 people who responded to this question, the **majority of participants (52%) preferred the typical cross-section**, followed by the wider cross-section



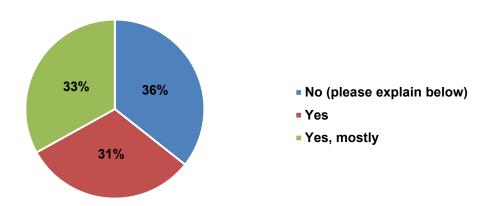
Participants were given the option to share more about their answer. Below is a summary of the 62 comments received through the open text box. Review all individual comments in Appendix A.

- People generally recognized that both Shaw and Blanton have their challenges.
- Many respondents noted that parking is a current issue on Blanton:
 - o Many would like to have **parking** either on both sides or at least one side.
 - A few people said that they would be **OK with the narrower or typical** cross-section, even if it meant losing on-street parking, as people could
 park in their driveways, on side-streets, or use public transportation.
 - Parked cars create blind spots for drivers, and thus an unsafe environment for pedestrians, children, and bicyclists.

- Several people were concerned about property impacts, while others seemed to believe that property easements were acceptable if more space was allowed for parking and separated bike and pedestrian paths.
- Many respondents commented that separation from traffic makes them feel safer.
- A few people mentioned that they would like to have uninterrupted sidewalks and traffic calming measures implemented on Blanton.

3. Do you think the proposed cross-section for Shaw is accessible and comfortable for all ages and abilities? (Check one.)

A total of 115 people responded to this question. Overall, **respondents said that they think the proposed cross-section for Shaw is accessible and comfortable.** However, a little over a third felt that it was not accessible or comfortable.

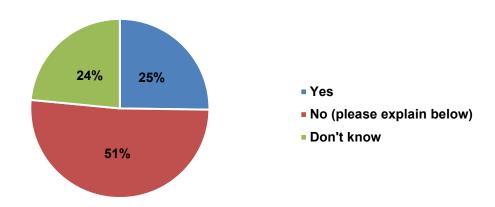


Participants were given the option to share more about their answer. Below is a summary of the 64 comments received through the open text box. Review all individual comments in Appendix A.

- Many respondents said that Shaw's proximity to the railroad and TV Highway make this corridor feel unpleasant and unsafe due to noise and pollution.
- People were concerned about:
 - Speeding along Shaw
 - Safely and comfortably crossing the railroad and highway
 - Pedestrians and cyclists not being separated
 - Removal of existing in-formal parking
 - People not using the signalized crossing at TV Highway
 - People experiencing houselessness and camping on the trail
- Respondents expressed the following benefits of having the TV Trail on Shaw:
 - Closer to businesses
 - Less of an impact on private property as compared to Blanton

- Would create a safe path to walk along the railroad
- Closer to transit service on TV Highway
- Vegetation and landscaped buffers would need to be added to make some feel safe.
- Many would like pedestrian, bicyclist, and car traffic to be separated.
- In general, traffic calming is needed along Shaw.
- 4. Would you use a trail on SW Shaw Street if you had to cross the railroad tracks to use crosswalks at TV Highway instead of crossing directly at Shaw? (Check one.)

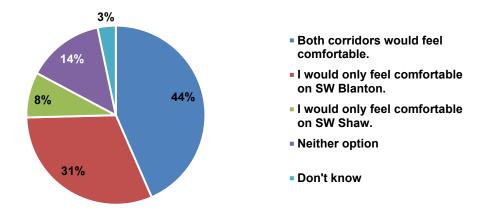
Of the 115 people who responded to this question, over **half (51%) said that they would not use a trail** on SW Shaw Street if they had to cross the railroad to use crosswalks.



Participants were given the option to share more about their answer. Below is a summary of the 82 comments received through the open text box. Review all individual comments in Appendix A.

- The majority of respondents said that they would feel unsafe crossing the railroad tracks and felt that using the crosswalks would be inconvenient. Several people said that they felt people would simply cross directly where they needed to and not use designated crosswalks.
- One person asked if a **pedestrian bridge** would be feasible.
- 5. Now that you know a little more about the two corridors being considered for the trail, which corridor do you think you would feel more comfortable biking, rolling, or walking along? (Check one.)

Almost all respondents responded to this question (122 of 123) and a little less than half (44%) of respondents said that both corridors would feel comfortable. More respondents said that they would only feel comfortable on Blanton that those who said they would only feel comfortable on Shaw.



Participants were asked to share more if they chose "neither option would feel comfortable" or "Don't know." Below is a summary of the 23 comments received through the open text box. Review all individual comments in Appendix A.

General concerns

- Suggestion to go back to earlier planning stages to find a different street for the trail as both Shaw and Blanton are not great. A few people mentioned Alexander St as an option.
- There were a few people who said they were concerned about people experiencing houselessness and camping on the trail.
- Concern about crime along both corridors.

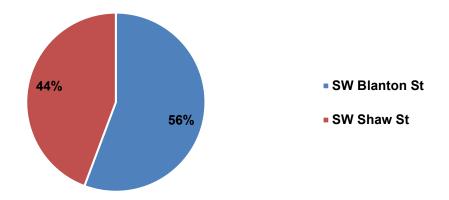
Blanton

- Too many driveways will create a stressful environment for people using the trail.
- Concern about impact to homeowners.
- Concern about increased traffic in neighborhood.
- Some said this corridor feels safer than Shaw.

Shaw

- Using the crossings at TV Highway are concerning and a "non-starter"
- Plant trees to create a more appealing trail.
- Putting TV Trail here will create a safe walking experience for people already walking in this area.
- This area should be improved, even if it is not chosen for TV trail.
- This area has more space (right of way), making it more desirable than Blanton.

If a participant chose "Both corridors would feel comfortable," they were asked which corridor they would prefer for TV Trail. Of the 70 people who responded to this question, over half (56%) of those said that they prefer SW Blanton St.



6. Is there anything else you would like to share with the project team as we finalize the concept for TV Trail? (Open text)

Below is a summary of the 52 comments received through the open text box. Review all individual comments in Appendix A.

General comments

- Many expressed general excitement about TV Trail and that it will connect people and places in the area; however, a few people did express that they would not like the project to move forward.
- Safety needs to be a top concern for TV Trail, regardless of which corridor is chosen.
- People said that they generally will use a trail that's closest to their homes.
- o Inquiry about **integrating plans for TV Trail with work on TV Highway** intersections at Cornelius Pass, 209th, Brookwood, and Century.
- A few people said that they would like property owners along SW Blanton St to be contacted directly about the project so that a compromise could be made r for the trail and potential private property impacts.
- Many would like to see speed bumps installed on both Shaw and Blanton.
- There were some specific suggestions about how to improve bike routes (please see individual comments).
- Some concern that land, homes, and buildings are too sprawled out for the TV Trail to work well in this area.

• Comments related to Blanton:

- o What people liked:
 - More exciting and pleasant corridor for TV Trail
 - Sidewalk improvements will improve the area
 - Closer to schools and public destinations
 - Will improve the area and the safety of Blanton, even if some property needs to be taken from homeowners

- o Concerns:
 - Property impacts
- Suggest one side with a multi-use path to limit impacts to property

Comments related to Shaw

- o What people liked:
 - Better corridor for bikes as it has less traffic
 - Potential sidewalk improvements will improve the area
 - Closer to transit stops
 - Less driveways
 - May be easier to develop
- o Concerns:
 - Impacts to parking and businesses along Shaw
 - Feels "exposed" and is loud
 - Would feel unsafe
 - May create more traffic
 - Intersections need to be built out
- Comments unrelated to TV Trail
 - Someone would like to see improvements made to the sidewalks along SW Kinnaman Rd between 185th Ave and Farmington Rd.

May 20 Tabling Event Summary

On May 20, 2021, members of the project team hosted two informal tabling events at the Westside Trailhead (SW 159th and SW Blanton) and Barsotti Park. The first was held from 1-3p and the second from 4-6:30p. At the events, park and trail users had the opportunity to learn about the project, the two corridors and provide input.

The event was set up to encourage quick conversations with the team and gather input in a variety of ways. It included displays of the proposed corridors that people could read and interact with. The event was bilingual, with all materials displayed in Spanish and English. There was a bilingual staff person to talk to Spanish speakers.

In addition to being able to engage with project staff and the displays, the public was also able to fill out a paper questionnaire that mirrored the questions in the online open house or scan a QR code to participate in the online open house directly.

The staff collected feedback from approximately **20 people** at the tabling events – whether through the questionnaire, engaging with the displays, or talking with a project staff member. Of those 20, four were Spanish-speakers.

Below is a summary of the feedback received. Review all individual comments in Appendix C.

Key Themes Overall:

- Overall **support for the project**.
- Overall support for added or improved sidewalks on Blanton St.

- Concerns about safety for all users, in particular kids, and a need for speed reduction measures. (Note: These comments were largely unrelated to TV Trail, and more about safety concerns about Blanton St in general.)
- Concerns about **impacts to property**, particularly on Blanton Street.
- Shaw is closer to transit stops and it is easier to find parking. Some thought Shaw Street was busier than Blanton Street, while others did not.

Key Themes from Questionnaire:

Note: Not all questionnaires were completely filled out.

Blanton

- Most participants agreed or mostly agreed that the proposed cross-sections are
 accessible and comfortable for all ages. One participant commented that, "The bike lane
 option would be ok with two lanes."
- Four participants, including two Spanish-speaking participants, preferred the cross-section with parking on one side. Two preferred a typical section.
- One person commented that a typical cross-section may not fit and had concerns about private property (in typical and wider cross-section designs) and worried about trees being cut.

Shaw

- One participant did not agree that the proposed cross-section is accessible and comfortable for all ages; one participant commented "yes, mostly – as long as you can walk on them."
- Two participants would use the trail on SW Shaw St if they had to cross the railroad tracks. One selected "yes, mostly." One participant commented that it "would be inconvenient for everyone. The half-signals are common for people to run flashing lights."

Four participants, including two Spanish-speaking participants, would **feel more comfortable on Blanton St.** Two selected both corridors and two indicated they had no strong preference.

People asked the following questions (which were addressed by project staff at the event):

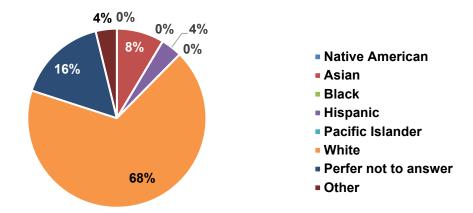
- How many feet are we gaining/needing in terms of ROW for each cross-section?
- What is the timeline?

Demographic Information

Participants from the online open house were asked a series of optional demographic questions. This information is useful to compare with the county's current demographics.

Racial or Ethnic Identity

Of the 104 people who responded, **the majority identify as white (68%)**, slightly less than the percent of Washington County population that identifies as white (82%). The second largest group of participants selected that they preferred not to answer.

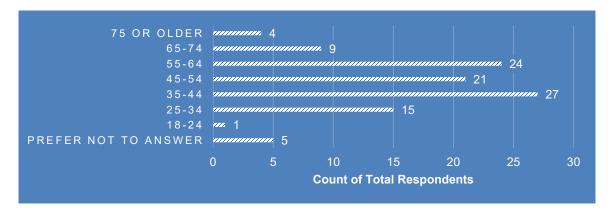


Language (other than English)

Participants were asked if they spoke a language other than English at home. Of the 97 people who responded, the **majority of respondents (88%) speak primarily English at home.**Answers that were submitted by only one participant each included: Japanese, Mandarin, French, and Indonesian.

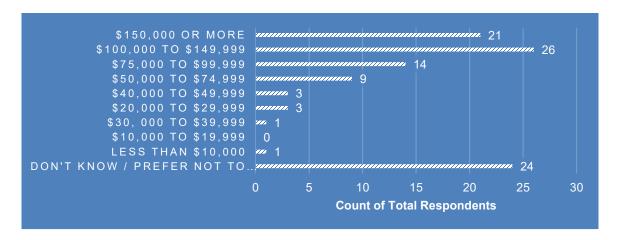
Age

Overall, the age of participants was higher than the median age of community members in Washington County (36 years old). Of the 106 people who responded, the largest group of participants are between the ages of 35 – 44 (27 people). The second largest group of participants are between the ages of 55 – 64 (24 people).



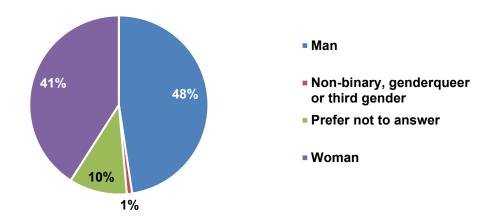
Annual Household Income Before Taxes

Of the 102 people who responded, the **majority have a household income between \$100,000 to \$149,999** a year, which was higher than the median household income in Washington County (\$74,033). About a quarter of respondents said that they preferred not to answer or didn't know their annual income.



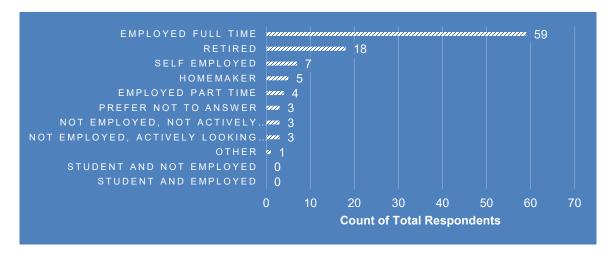
Gender

Of the 105 people who responded, almost half (48%) identify as men and 41% identify as women, with 10% of respondents preferring not to answer and 1% indicating they identify as non-binary, genderqueer, or third gender.



Employment Status

Of the 103 people who responded, over half (59 people) of all respondents are employed full time, with the second largest group (18 people) being retired.



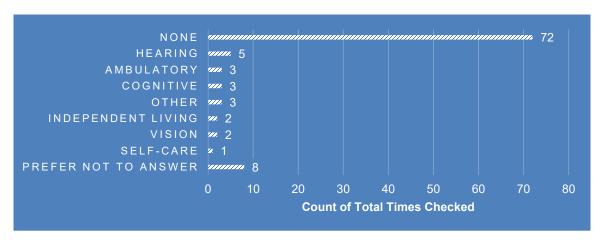
Zip Code of Primary Residence, Employment, and School

The most common zip codes are listed below. More detailed information can be found in Appendix B.

- 1. Primary Residence: 97078, 97003, 97007, 97123, 97124
- **2. Employment:** 97123, 97124, 97003, 97005, 97006
- School: Only 16 participants identified a school zip code, of those, 97003 and 97078 were the most common

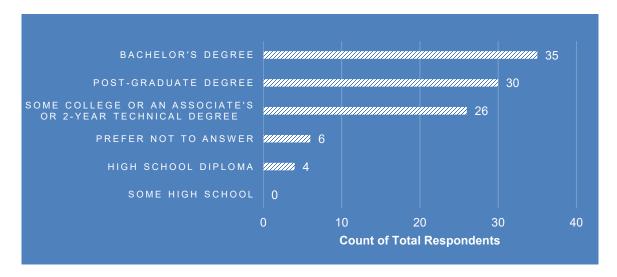
Disability

Of the 89 people who responded, the **majority of respondents (80 people) indicated they had no disabilities or preferred not to answer**. The most common disability indicated was hearing (5 people). *Note: This was a "check all that apply" question, therefore the number of people who responded will not correlate to the sum of the total times a disability was checked.*



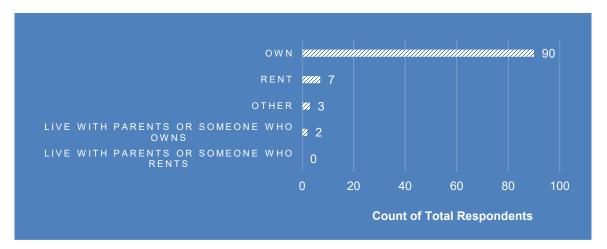
Education

Of the 101 people who responded, a little more than a third (35 people) have a Bachelors degree, 30 people have a post-graduate degree, and 26 people have some college, an associate's, or a 2-year technical degree.



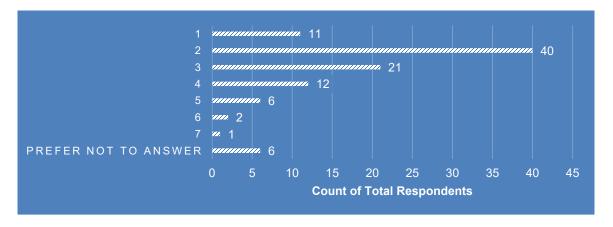
Rent or Own

Of the 102 people who responded, the **majority of respondents (99 people) own their home**, while **7 people rent**. A few respondents (2 people) live with parents or family.



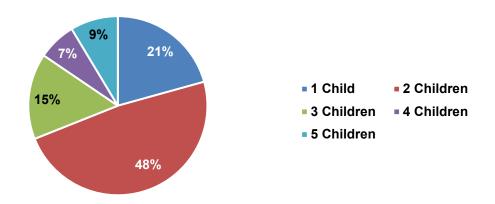
People in Household

Of the 99 people who responded, the **majority of respondents (82 people) had two or more people living in their home**. 11 people said that they live alone.



Children under the Age of 18 in Household

Of the 58 respondents who said they have children in their household, **almost half (48%) have two children** in their homes.



Access to a Vehicle

Of the 102 people who responded, the overwhelming majority (93%) of respondents indicated that they have access to a vehicle. 4% of respondents did not have access to a vehicle.

Appendix A: Online Open House Open Text Questions

Below are the comments respondents submitted for the open text questions in the open house.

Question 1: Do you think the proposed cross-sections for Blanton are accessible and comfortable for all ages and abilities? Please tell us more about your answer. (Open text)

- Strong dislike for the narrower cross-section
- To much private property taken. You don't have a moral right to do this on a residential street!
- Lower speeds.
- Yes the multi use path is separated and not on the street. Thus it's safe an pleasant for all
- I would worry about biking/skating/walking kids and drivers at intersecting driveways
- The narrower cross-section may not be comfortable for bikers of all ages and abilities because it doesn't have a physical separation from auto traffic.
- Goes through too much residential. you can concerns about driveway access and street parking for those areas. Too many variables to account for and less controlled environment.
- No comment
- See Below
- As a number of the lots along Blanton are of large size and zoned for multi famliy housing transit or parking needs to be planned for.
- I like the appearance and additional sidewalks and trees.
- Bike lanes must be straight as possible no weaving around telephone poles in sharp curves. Bike lane must also be asphalt - seamed cement is very bumpy. Last bike lane gradients must be smooth going across driveways. South Hillsboro violates all of these and no one I know wants to ride through there.
- Narrower cross section isn't as safe. No buffer for cyclists from vehicles.
- Would have to take out lots of housing to do it correctly.
- The narrower cross section with bike lanes NOT separated is the least desirable.
- The narrower cross section wouldn't be comfortable for children.
- Seems that way according to maps.
- The typical and wider cross sections do a good job of integrating people into the community architecture while considering the accessibility to amenities and other things that will make traveling along this corridor attractive.
- As long as the bike lanes are physically separated and not like in the ""narrower cross-section"" diagram.
- Anything would be an improvement for Blanton but this not only adds pedestrian/bike area but also much needed parking that isn't just on someone's grass
- Honestly I cannot believe that Blanton is Even being considered for this project. As someone who lives off of Blanton and 165th, I know this would be a huge mistake adding the trail to this road. The road is already incredibly narrow to cars cannot pass by

- each other without stopping. The park and townhomes are extremely crowded and driveways are literally every 20 feet. As an avid bike writer who used to work for a pro cycling company I know from the customer demographic of cyclists specifically. They will not want this type of environment for this trail.
- Maybe change speed on SW 160th so people using it as bypass are not racing down it.
 The partial light or full light would otherwise work
- One of the biggest problems on Blanton right now are that the traffic signal detectors are invisible. Are they loops, cameras or radar and where do you place your bike to be detected?
- Blanton really needs sidewalks so we can walk our dogs and kids can ride their bikes safely!
- I have my son 5 years old is dangerous walking along the street. It would be nice to have just a walking corridor along blanton street. Other than that, It would be nicer if the street gets narrower so that cars would slow down.
- Blanton is too narrow to do this
- Prefer to add Flashings since the evenings get dark here. It may be hard to see someone crossing the street.
- The driveways and intersections create hazardous conditions.
- The typical and wider cross-sections provide nice walking and bicycling facilities that are both vertically and horizontally separated from traffic. The narrower cross-section could be made more comfortable by placing intermittent physical barriers (e.g., bollards, rubber ""tough curbs,"" pre-cast cement curbs, etc.) between the painted buffer to provide an added measure of protection from drivers and improve bicyclists' sense of safety. In other words, painted lines marking the location of bike lanes won't cut it. Paint isn't infrastructure.
- The ""typical"" and ""wider"" would be great but the ""narrower"" would not be. Cars routinely go over 35 MPH on this road and the narrower options is more likely to have a bike/car accident.
- The proposed ""Typical Cross-Section"" is going to feel more comfortable to users walking, biking or rolling. The Wider Cross-section (Parking on One Side) will still feel comfortable, however crossing at a signaled crosswalk will make result in users feeling more uncomfortable as they are exposed to more road for a longer period of time.
- I fear that I will have undesirables in my back yard.
- Blanton is a pleasant street to walk or ride today. The proposed improvements would make it much moreso.
- Which is the proposed cross-section? Children under 10 have limited ability to stay
 within a bike lane and are in danger of being hit by a car when only a painted line
 separates them from traffic. Therefore the narrower cross-section will not be safe for
 children.
- Everything but the narrower cross section is suitable. There are many young children in the neighborhood, so we need as much protection as possible there. People often speed through Blanton, and it's treated as an alternative freeway to avoid TV Highway and Farmington. I have a coworker who does not live on Blanton, but regularly uses the street as an alternative to the highways.

- move the grass strip and trees outside of the sidewalks; the trees drop leaves and branches on the bike ways, along with dangers of low branches
- I bike that route very often. I feel safe with it as-is except for crossing 185th and the narrow blanton west of 170th.section
- I worry how we will keep this part of our community clean and safe with increased foot traffic given increased crime and illegal camping.
- Please help our cities solve the our current problems (such as our current homelessness issues) before spending more money and taking peoples land.
- Not safe for all ages
- To much jig jogging and to much impact on the home owners along Blanton, many of the homes are to close to the existing street.
- Having adjacent but separate spaces for bikes and pedestrians should help a lot.
 Obviously curb cuts will be important.
- Painted buffer is not enough of a barrier between bicycles and cars
- Blanton is an easier intersection for both cars and people at the 185th and 170th intersections
- I like having a path off of TV Highway that is easy to use.
- There is not enough room on Blanton between 198 & 209 without stealing property from homeowners. They barely have enough front yard space as it is. According to the diagrams, only a narrow cross section MIGHT work & that is ugly! You would have to destroy the trees already well established! You are destroying Oregon! Put your corridor on TV Hwy where there is TONS of room & quit destroying people's property.
- It's a road, update as such
- This is a big relief for our family, that's means my daughter able to ride her bike safely.
- Please do not include any car parking on the street. People can easily park their cars on the other side streets. Protected bike lanes are needed. What does this to do help with the death of people on Scholls Ferry Road?

Question 2: Considering the tradeoff between property impacts and comfort level for people walking, biking and rolling, which cross-section would you prefer to see on most of the corridor? Please tell us more about your answer. (Open text)

- In residential and business areas, it is very important to allow space for cars to park against the curb. Only on highways/freeways is parking space not needed.
- Please ensure safe turning lanes when possible and ensure that the landscaping is sustainable and will not interfere with power lines and create a fire hazard.
- Blanton is a residential street with old Aloha private residences/ You need to find a way to do this that does not destroy peoples' yards and landscaping!
- Safer alternative
- As a cyclist, I prefer on-street bike lanes but would need to see how side streets and driveways are handled (don't want to keep going up and down)

- The narrower cross section will get the less comfortable riders on the sidewalk. Or worse, biking in the wrong direction.
- I'd be comfortable biking on the narrower XS too. Affected property owners should have the most say in typical vs wider. They may prefer parking or maybe prefer more front yard.
- Additional parking is not needed
- Narrower cross section could end up being worst of both worlds. Fewer people might feel comfortable using it. And if it's not significantly more comfortable than the major street alternatives, it might not get all bikes off the highway.
- This will reduce options for residents to park on the marked walkway, a problem Blanton currently has.
- No comment
- Is there a real need to have a walk and bike lane on each side of the proposed improvements? In Washington County, there is really a very small proportion of walking and bike riders on nearly all improved streets.
- Paarking on both sides needs to be added in. Bikes cannot be that close to peds and bikes have a tendance to ignore traffic rules and hit peds.
- I think compromise is important but we must serve all users while controlling cost.
- Assuming it's designed *well*, the typical cross section is ideal and provably safest with full bike-car separation.
- Better safety for cyclists with complete seperation from traffic.
- Need to go big because it will be needed in the future. Unfortunately, you will have to take out lots of lower cost housing.
- I really like the separate bike and sidewalk from car traffic. On the other hand, I would be
 really upset if I was a property owner and my property was taken for a bike path. I hope
 that you are careful working with property owners since this will have a major impact on
 their property and value.
- Safest for bikes. Don't think that parking on Blanton is needed. Can park in driveway or on a cross street.
- The wider cross section would create blind spots for people exiting the road to residential properties or businesses due to parked cars. It could also attract street campers from out of town.
- Not sure whether parking for cars is necessary enough to justify the added cost.
 Particularly if people could use public transportation to reach different portions of trail.
- There are many people who line up parking on both sides of the street, so the narrower
 cross section would end up with many cars parked in the bike lane, requiring additional
 enforcement. No street parking would adversely affect several multifamily properties
 along the street.
- As the area grows traffic is inevitably going to increase. Creating stronger barriers between biking/rolling/walking areas and traffic are going to make people feel more safe.
- I'd prefer to minimize parking on the corridor.
- The trade-off is basically a few home owners vs. MANY people who could use the trails. Plus the home owner would have better parking options

- None. Blanton is a narrow almost impassable 2 Lane Road. I can't imagine how much space of my neighbors front yards you would have to take away in order for this trail to please the general public. I do not think the people who live on Blanton want their property to be taken from them by the government for this project. I can't believe I didn't know about this project until I got the small flyer in my mail today. People are just planning a large disruptive trail right next to my house basically and this is the first I'm hearing about it?
- With a park on Blanton people and families will want parking by the park
- It is already a difficult street to drive down, and parking is a mess. Including some would reduce potential for accidents and congestion.
- Parking on the street is a real problem right now in the Barsotti Park area. Being "doored" is a real worry for cyclists.
- Their are a ton of vehicles near the park on Blanton (around 166th) so parking is a very big need!
- A wider cross-section would be ideal, but a typical cross-section would still be okay if it
 includes uninterrupted sidewalk. The bigger issue is speeders on Blanton who already
 make it unsafe to walk; speed bumps and lights could help!!
- Yards are large on Blanton and some easement can be taken that will improve the neighborhood and increase property prices even with slightly smaller lots
- Rather than having both a sidewalk and a separate bike lane on each side of the street, I'd prefer a shared, multi-use path. There is a great example of this on Beaverton-Hillsdale Hwy between 39th Ave and Dosch/30th Ave. The wide buffered bike lane includes a pedestrian track and raised curb protection with candles. It's simply marked for the right side of the path for pedestrians (slower traffic), and the left for cyclists. This would minimize property impact, and create a safe space for all users.
- This is confusing they ALL show 74' across, meaning the impact on my property will be the same. My answer is based on visual preference.
- The typical cross-section would feel more comfortable for people walking, biking and rolling. If off-street parking is strongly needed, the wider cross-section can be considered. However, both options should consider traffic calming as well (at least towards areas where people walking, biking and rolling need to cross the road). Users are not going to feel comfortable at crosswalks, unmarked or signalized, if vehicles are driving well above the posted speed limit and are reluctant to stop despite the state of the signal. Consider: https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/
- We do not want this at all!
- Many neighborhood residents and visitors park on Blanton Street now. Preserving the availability of on-street parking would increase acceptance of the trail.
- I'm unfamiliar with parking needs on Blanton so I've chose the typical cross-section. However, if there is a need for parking, I would choose the wider cross-section.
- I propose doing something along theses lines, as it would be safe, minimize property impact, and would significantly reduce cost: https://bikeportland.org/2021/02/23/step-by-step-streets-in-hillsdale-have-gotten-safer-327039
- People already park along the sides of Blanton. Keep parking on the side of the street.

- Acquiring ROW on the North side would be wiser than on the South side, in my opinion. It impacts property but would likely improve it and increase its value.
- Due to the amount of children in the neighborhood, we need as much protection as
 possible for the bike path and sidewalk. However, we should avoid overlapping too much
 on property, to reduce cost, and to reduce the amount of property modification that
 would need to occur. Many of those parking on the street also have driveways and
 garages that are not being utilized, so parking on the street should not be required.
- It would be easier to implement if homeowners feel their property won't be seized by imminent domain laws.
- get rid of the grass and trees, and keep the speed 25 mph and bikers will be fine
- This is such a tough choice. Shaw is such an eyesore but navigating those intersections as a pedestrian are HORRIBLE. If Blanton is chosen does that mean Shaw will remain a dump? And how do the Blanton residents feel about the road widening? How much of their front yard is going to turn into street and sidewalk? I've had this survey open on my PC for the last week unable to choose between the two because of these issues.
- Property impacts should not be ignored
- We should honor the property rights of those that currently live within that area.
- It is wrong to steal peoples land even if it's legal. It is simply immoral.
- Riders/rollers can be more relaxed than if they are on the roadway. Good compromise on use of property.
- The landscape buffer increases walking & biking comfort a lot as does having the bike lane separate from the roadway
- Safer
- You plan for Blanton takes way to much property away from home owners.
- On my own I would prefer the typical cross-section, but the lack of parking on Blanton between 160th and 170th has become hazardous.
- Parking may be needed in denser areas
- Separation of walker and bikers with trees is safer on Blanton especially as it is known to be a place where cars speed and cause accidents
- I really like having a bike path separated from the road. I think more people would use it.
- Your cross sections are unfair to property owners &/or the trees you will destroy between 198 & 209. Put the corridor on TV Hwy. You have TONS of room there!
- While the typical cross-section is my preference overall, a narrower cross-section may be the best option between 198th and 209th, as residences along this section, which are already close to the road, would be sorely impacted.
- It's a road, let them bike in Portland you have NOT had an a large volume of requests for this TV hwy is a dump
- I feel more comfortable on paths like this when there is a buffer of tree, shrub, etc. I have small children on bikes so this provides extra safety for them.
- minimizing property impacts is important for this community.
- I love protected bike lanes and street trees, but please make the car lanes no more than 10' 8"

Question 3: 30 you think the proposed cross-section for Shaw is accessible and comfortable for all ages and abilities? Please tell us more about your answer. (Open text)

- The proximity to the railroad and traffic of TVH seems like both a hazard and an
 unpleasant experience due to the proximity to noise and pollution. The combining of
 bikes and pedestrians on the same sidewalk without separation will also be dangerous.
 Likewise, bikes having to share lanes with cars in also unsafe. The Shaw corridor is not a
 good idea.
- Shaw is mostly parallel the railroad tracks. There is a large margin of unused land between the railroad right of way and Shaw. Trails, parking and pedestrian way can easily fit along there without impacting any private property on the other side of the stree.
- Yes because those who feel comfortable with riding on the street can, those that don't can ride on the sidewalk or path
- It seems to be the worst of all worlds. The sidewalk is still noisy with bad air quality from TV Hwy. Those comfortable with sharrows already can use Shaw with it's low traffic volume. Sharrows will annoy the car centric businesses and their car centric customers by putting cyclists on the street.
- There are fewer cars on Shaw but they tend to drive fast
- The blue line is great and seems to be the most direct path.
- I would be a little nervous about drivers taking this route and not necessarily being respectful of cyclists (but I'm not a seasoned biker with much experience riding in traffic).
 I would want to add vegetation (trees?) along the way also - esp. between TV Hwy and Shaw.
- Personally I would feel uncomfortable crossing at such an intersection. I would worry in particular about traffic turning off of TV Hwy not realizing they need to yield to me.
- I prefer the trail to go through less residential.
- Crossing the railroad seems not safe for some people, especially if you need to cross twice just to stay on one side of the railroad.
- No comment
- These proposed major highway crossing are unsafe for bike riders and pedestrians with the current and future traffic patterns.
- I prefer Shaw over Blanton because you can see the businesses on TV highway that you
 may be your destination, however, that would also tempt idiots to jaywalk if their
 destination is far from the next crosswalk
- It is time to push the railroad out and deal with the legal requirements for a rails to trails process.
- Accessible but much less attractive than the Blanton route. If it's not attractive, people won't use it recreationally.
- I don't understand the point of the sharrows here. If there's a path within N feet of the road, aren't cyclists required by law to use it?
- A little concerned about pedestrian cyclist mix.

- This route will remove all of the parking that currently exists near the railroad. Going to cause problems.
- Biking would be difficult with kids but I see lots of people walking along the tracks already so this give a safe path to walk.
- Too close to noisy traffic on TV Highway and trains.
- The signal crossings cloister to TV hwy could be uncomfortable for children and may lead to impatient people to just cross the road in traffic instead of going to the signaled crossing.
- Nothing regarding what I see pictured in these crossings looks that difficult for all users.
- There are many businesses that use street parking along Shaw, along with many homeless living in vehicles and abandoned vehicles along this route. Street parking is very likely to be an issue. Also, this road is often used at high speed by individuals bypassing the lights on TV highway, so bikes on the road surface will be in elevated danger (185th to 198th section)
- Having limitations on which side of the cross section you can travel on is going to result
 in people misusing these spaces and causing issues. People are going to bike in the
 side that is convenient, not the side that is designated which may interfere with walking
 /rolling.
- I think separating waking, biking, and car traffic is the best solution to make people feel the most comfortable.
- It'll still be a problem because it'll be another "stop" that drivers have to make so close together which means they'll be more upset and/or take more risk
- Shaw Street is Obviously the better choice For this trail. It has train tracks on one side with no houses and no driveways. You'll have much more room to implement the trail without ruining the livelihoods of everyone on Blanton. Looking at the map of Shaw Street I can see that there's less driveways, less single family homes that will be affected. There is a strip right next to the railroad that is just empty blank land ready and waiting to be turned into a trail. Honestly I have no idea why Blanton is even a consideration for this trail when there is obviously plenty of room to start this development on Shaw Street. Me my neighbors and my whole neighborhood would be devastated if the trail was developed on Blanton.
- Still to close to TV HWY
- If the walking paths flowed to the TV highway gor crossing it would work great. No half lights to be put in and less for traffic to need to double stop.
- Apart from the crossings, this is the better option. Less potential for disturbing homeowners and private property, and increased likelihood of helping small businesses.
- Single sided bike lanes mean having to cross back and forth across the street when ever that lane starts and stops (I use the bike lane going N of Cornelius Pass Rd. but never going S)
- Between 160th and 185th the properties look really rough! I would not use this trails due to safety!!
- don't think people will walk/bike down a block to cross street & come back
- People drive too fast along TV highway and the intersections aren't safe for pedestrians.
 The Blanton corridor would be less noisy for walkers.

- Walking nearby TV Hwy the street is too busy.
- Business based street and not good for bike or pedestrian travel
- I feel Shaw street is the better of the two proposed portions of the trail. Shaw already
 has very adequate space between the railroad tracks and Shaw street for a trail. Its
 travel along the TV Hwy corridor would make it easy for walkers or bikers to access
 TriMet.
- The potential width of shared use path is an important detail I'm not seeing here.
 Crossing treatments will be critical for this potential alignment. The idea of crossing at TV Highway is really unappealing.
- The cross section would be better improved for walking, biking and rolling users if more traffic calming was applied. If that requires reducing the width of the roadway itself, do so. A smaller road width will result in shorter, safer and more comfortable crosswalks for all while reducing traffic speed.
- We are concerned about others accessing our neighborhood.
- Children would need to ride bikes on the sidewalk.
- Confusing for both young and elderly people. Also, too close to a highly congested traffic area.
- People won't want to go out of their way to cross the street. They won't walk over the railroad tracks, use existing crosswalks and go back to Shaw.
- Too close to the railroad line. Placement here would encourage more dangerous foot traffic over the rail line.
- Shaw is not used by the community much. It's more for business access, than a
 residential street. It is exposed, doesn't have as much access to parks, is full of trash,
 and is loud due to being adjacent to the highway. If built here, I think we'd see reduced
 usage, as opposed to Blanton.
- Shaw is notorious for litter, especially glass and metal. I would be concerned for pedestrians' feet and bike tires.
- These questions are unclear. Your pictures show yellow and blue, and those words and colors should match in these questions.
- This is such a tough choice. Shaw is such an eyesore but navigating those intersections as a pedestrian are HORRIBLE. If Blanton is chosen does that mean Shaw will remain a dump? And how do the Blanton residents feel about the road widening? How much of their front yard is going to turn into street and sidewalk? I've had this survey open on my PC for the last week unable to choose between the two because of these issues.
- Im not sure we would be able to keep this new part of our community clean and safe with increased crime and illegal camping.
- We have a huge homeless crises happening right now and corridors like this are often used for camps. Portland city is "moving" homeless camps and those people will be looking for places to stay. They are already coming into the suburbs and making them less safe for children. Please solve our problems first before wasting money on projects like this! They will be ruined by camps if you don't address that problem first.
- Too close to TV Hwy & RR tracks. Noise and toxins from both are too high. 198th crossings near TV Hwy are too busy.
- There could be conflict on the side where bikes and pedestrians share a lane

- There needs to be a separate bike path, and you should not have to go up to the main highway just to cross the road. There's only one train that runs that line, and it's time for them to share!
- It's too straight and I think drivers will go too fast to put bikes on it. Blanton is full of reasons for cars to slow down.
- Forcing people, especially children, on bikes to share the road with autos is not comfortable for anyone.
- Avoid crossing on TV Hwy if at all possible to avoid having traffic fatalities.
- I am not sure if separating the bikes and pedestrians is better or worse.
- Only with direct crossing
- It can become very messy when the train is also crossing and cars are waiting on pedestrians and bikers.
- Accessible = yes, mostly. Comfortable = questionable, even with crossing signals, due to high traffic (and, sadly, impatient drivers) on these cross streets.
- What is this needed for?
- So much extra work required to cross the street. Crossing tracks is tricky for strollers and those with mobility issues. I would use a different path if I could.
- The crossings don't seem the most efficieny or comfortable. Though it has less empact on homeowner property and parking.
- I thought Shaw was going to have the bus 57 bus-rapid transit? Bus 57 needs less congestion!

Question 4: Would you use a trail on SW Shaw Street if you had to cross the railroad tracks to use crosswalks at TV Highway instead of crossing directly at Shaw? Please tell us more about your answer. (Open text)

- I live south of the tracks, and I would cross the street where it is more convenient for me, below the tracks, whether there is a crosswalk there or not. Every street should have sidewalks regardless.
- This seems unsafe, unnecessary, and an extra burden to pedestrians, who will have to walk out of their way to continue on the same path. The Shaw Corridor is not a good idea
- railroad tracks would be okay. crossing at TV Highway is a lot of distance and very dangerous
- I wouldn't feel safe with a bike on railroad tracks
- out of the way to cross. People will cross where they want to cross (I would suggest crossing them further to the south, away from TV Hwy and rail crossing)
- I would probably try to cross at Shaw between traffic flows.
- What about a pedestrian bridge?
- It's inconvenient. Light signals at TV highway can be long. I've seen pedestrians run across traffic at Shaw at 170th just to avoid the extra few steps
- I would use it as long as a train isn't blocking the path.

- I would definitely prefer being able to cross at Shaw. If the overall experience of being on the trail was positive, though, I think I would be willing to go out to TV Hwy...
- Traveling out of direction (by having to use TV crosswalks instead of crossing directly at Shaw) does not feel comfortable
- There is a crosswalk at every corner per Oregon law. Most people would take their chances crossing at the intersection rather than crossing the tracks twice.
- This seems too much of a detour to cross railroad twice.
- Direct crossings at 185th, 170th, and 160th would be complex, expensive and a bottleneck for the current high traffic volume because of the immediate proximity to the RR.
- Too much of a pain to deal with. Concerned about the safety.
- I think the crossings would be inconvenient. Shaw is very close to TV Hwy and people come around the corner onto 160th quite fast and without looking, so I wouldn't feel safe crossing at Shaw with my family. We already cross at Blanton and that feels safer. I would not want to have to walk all the way to TV Hwy to cross to get to Shaw.
- No, i do not like riding my bike over tracks
- If I lived and had a need to go from any place within this area, I would drive. It is much safer. Trafffic, bikes and pedestrians are not a good mix in this area.
- Too inconvenient
- Direct crossing will not meet the spacing requirments in ASHTO design standards.
- Railroad is a deterrent to use because it's an eyesore.
- 1) big detours are going to slow down rides. 2) I'm betting foot traffic and cycle traffic will be merged onto the same path (or use existing sidewalk) which is stressful when pedestrians are also there. 3) there's no way that path / crosswalk will stay clean of tire-puncturing debris. 4) the crossing at TV highway will be super dangerous because of folks making right turns on red. 5) TV highway is an ugly assault on the senses pollution, noise, and garbage.
- I cross Max lines frequently so I really don't see a difference.
- Crossing tracks is risky, I know lots of people who have slipped on them. And at some point, someone will get hit by a train.
- Riders will not detour to use a signaled crossing. They will just try to cross directly. Too many turns in the detour and too much traffic.
- Question is a bit confusing to me, but is surely feasable.
- That would be extremely inconvenient like it currently is
- I would prefer not to need to cross to TV highway, as this will cause conflicts at 185th
 with bus stop traffic and many pedestrians loitering in this area. Ideally, the stop lights for
 185th and 170th northbound would be south of the tracks to eliminate cars piling up and
 blocking the crossing for the path. The right turn from TV highway to 170th south would
 also need additional traffic controls to prevent speeding through and hitting someone in
 the crosswalk.
- It has been very clear that people are going to take the oath of least resistance. I would not want to walk out of my way to cross, and I suspect many people will try to cross illegally vs detouring from the simplest route. This concerns me as it may lead to

- additional pedestrian accidents and create frustration for all travelers. This proposal does NOT put non-automotive travel at the center, but instead is catering to drivers, and ultimately serving no one well.
- The railroad tracks are such an encumbrance in our city. There's a physical and
 psychological barrier that diminishes flow north and south across TV Highway.
 Especially having to walk/bike our of your way just to access a crosswalk. And when
 there's a train slowing everything down, it becomes more of a nuisance.
- Kill the trail. We don't want it in our neighbo.
- It's inconvenient for some. I will guarantee you that many users will just cross the street at the trail anyway instead of routing to the intersection.
- This question does not even make sense. It is a run on sentence. Can you please add a visual aid for people who don't know what you are talking about?
- Having a partial liggt that close to TV highway with how people drive would be problematic. I don't have problem following the trail for walking as it would be safer than attempt at crossing away fron a light like people do on Farmington rd
- These crossings do seem a challenge, unfortunately, and make this clunky and not very user friendly. The direct crossings would be a huge improvement if possible.
- This is one of the main reasons that Blanton is better
- Not safe to cross at RR tracks. You could easily trip over the tracks.
- I would feel like to cross the street without going further option
- Too loud and close to speeding cars.
- There's too much traffic on 185th for this trail
- needs a direct pedestrian crossing because TV HWY is dangerous
- Just doesn't seem attractive so I'd go elsewhere in the residential neighborhoods.
- Bikers dont like to stop so minimal crossings would be best. Make it easy.
- Crossing TV Higway is a deal breaker for me, not to mention for my children. You might as well not even plan a trail if people walking, biking, and rolling are forced to cross at the hellish intersections along TV Highway.
- I personally would feel comfortable doing this, however, I would be concerned that some people would attempt to just cross without going to the crosswalk.
- Those lights take forever, I would be tempted to jaywalk
- The Direct Crossing at Shaw options will mess up the traffic AND create a higher potential for an unaware drive to hit a bike/walker. It's too close to an actual light.
- At all of these intersections with the TV Highway, the biggest danger to users walking, biking and rolling is going to be drivers turning right on red or using slip lanes at intersections. Not only that, but having to cross the railroad is very inconvenient. It would be best to reroute users to the south side of SW Shaw Ave well before these crossings, and have users cross further south of the railroad grade crossing.
- Direct crossing should be available. TV should be an option for those that don't want to use the direct crossing. I already see people crossing directly on SW Shaw. Direct crossing should be safer with the installation of the crossing signage and lights.
- We don't want this why won't you listen?

- I would probably use the trail crossing at 185th, which is not too much of a detour and safer (assuming Blanton maintains its currrent alignment). Crossing 170th and 160th, I would likely divert to Blanton to avoid the RR tracks and have a straightforward crossing. But I would still use the Shaw trail where possible.
- If I was commuting to work by bike, the time it would take to use the crosswalks at TV Highway would be extremely frustrating. I could see safety issues as bike commuters try to cut through traffic for a direct crossing at Shaw.
- I personally would feel comfortable doing this, however, I would be concerned that some people would attempt to just cross without going to the crosswalk. This is such a busy intersection, that I feel it would be both a nuisance for drivers and a danger to cyclists/pedestrians.
- I and others hate going out of the way when there is a more direct route to cross the street
- Yes, but I'd prefer to stay away from Shaw Street. It is uninviting. If you're on Shaw Street you might as well be in a rail yard.
- People are going to cross using the most direct route regardless, so you might as well build an official crossing location at Shaw. There isn't a formal crossing at 165 & Blanton, and people cross there constantly. It's not worth walking all the way to the crosswalks and back.
- I don't know what you are asking above. Regardless, people travel like water flows and will take the shortest route possible, including shortcuts.
- The intersections at TV Hwy are horrible. There is so much traffic, that it is hazardous every time a car might be making a right turn (they don't look to their right). I'm sorry I don't know what the solution is but as a ped, I encounter this all the time.
- People will cut across. It's human nature.
- Might be harder for those with limited mobility to cross the railroad tracks
- rather use blanton
- They will be over run with our homeless population, because no one is helping them get off the streets! It won't be safe and there will be needles everywhere. I already see them all over the place and and an easier path to Portland will absolutely become over run. Please solve the homeless crises first.
- The lack of half-signals is a big drawback in my opinion. The existing crosswalks at TV
 highway already have enough foot traffic that an influx of bicyclists may feel too
 congested. The added turns to reach the existing crosswalks would make for a clunky
 ride or walk.
- Neither choice of crossing is very safe. There are sometimes lines of traffic on 198th waiting to merge onto TV Hwy lining up well south of Shaw. Crossing the RR tracks is hazardous.
- the crossing is too far out of the way
- The main idea is to have a path way that does not share crosswalks with such a busy highway.
- The corner of TV Highway and 185th can not be made safe enought... crazy people turning are a regular occurance.
- too far out of the way

- Shaw is so close to TV Highway, this route wouldn't be very pleasant to walk or bike on. Having to use crosswalks on TV Highway makes it seem like it's hardly worth it to call it a "trail" it'd just be a frontage road to TV Highway.
- Not a direct path
- Crossing at or near TV Hwy is very dangerous the light at Shaw and 198th Ave makes more since than going up and out of the way to cross the highway and RR tracks.
- I am pro crosswalks
- Out of the way, slow lights, danger from turning cars
- Too out of the way, people will just go right across at Shaw when drivers aren't expecting them, resulting in safety risks.
- It's not safe for kids
- It seems to me that we're trying to get away from TV Highway so of course it would be prefferable to cross directly at Shaw.
- Question is confusing
- This would merely be an inconvenience to me as a walker, but I think having to cross RR tracks would be an obstacle to someone biking or rolling.
- It seems as though people will ignore the TV highway crossing and just take the shortest distance between two points despite safety concerns.
- Being so close to railroad tracks and crossing them like this seems to add an unnecessary layer of potential safety concerns, especially if you are wanting to make this path comfortable for a variety of users.
- I would use the most direct route and from what I have seen in my lifetime, most people, especially teens would use the most direct route
- I thought Shaw was going to have the bus 57 bus-rapid transit? Bus 57 needs less congestion! TV highway AND canyon Road both need redos to stop the death. Where is the county pressure that needs to be put on ODOT? When will the county stop allowing drive-thrus and giant parking lot construction on that death street?

Question 5: Now that you know a little more about the two corridors being considered for the trail, which corridor do you think you would feel more comfortable biking, rolling, or walking along? If you chose "neither option would feel comfortable" or "Don't know," please use this space to explain. (Open text)

- Shaw corridor option should include planting many trees to "soften" the existing industrial vibe.
- This area has a very heavy traffic influence and will only get worse when South Hillsboro development expands. Traffic, bikes and people do not mix well at this area.
- Blanton's many driveways will be stressful. As cyclists, you'll be looking out for suddenly backing-out cars who can't really see that well in reverse. They'll also be looking for people moving at pedestrian speeds, not 15mph. I'm also betting that the bike path won't be level and will dip up and down constantly like South Hillsboro please prove me wrong. For Shaw, crossings at TV Highway is a non-starter.

- I see many people walk along the railroad tracks so the Shaw section give people a safe designated place to travel. I do not like having to cross the tracks if I had kids riding their bikes with me. I like the Blanton section but would not like to impact home owners property just for a bike path.
- I think this project actually needs to go back to an earlier planning stage and locate a corridor that is exclusively bike/pedestrian and limits the interactions between cars and bikers/pedestrians. I think Shaw and Blanton are both trying to force solutions for everyone and as a result it's not going to turn out well for anyone. We've already got a disproportionately large focus on auto traffic in the city and area. I would much prefer to see a large pedestrian bike trail running parallel to TV Highway where possible connecting Downton Hillsboro, South Hillsboro, and Downtown Beaverton. Let's encourage more alternative forms of travel by providing good walk and bike accessibility that is independent and separate from car traffic and pollution.
- Homeless encampments will take over
- I would prefer trail north of the tracks going along Alexander.
- The intersections are big especially at 185th. While it would be nice to make
 improvements on Blanton, the increase in traffic would have negative impact in those
 neighborhoods. Shaw street makes more sense, but still lacks the county trail feel as it
 follows TV Highway the whole way. Has Alexander been considered? Better access to
 many businesses. Bigger buffer to front yards than on Blanton.
- Users of SW Blanton will want to access transit. Even on SW Shaw, there are visible desire lines of users crossing the railroad tracks at unsafe points just to access transit on the TV Highway (e.g. Stop 5593). An additional challenge to SW Shaw is that crossings over the TV Highway to businesses and shops are few and far between. My proposal would be to apply a complete-street (with traffic calming) design to SW Shaw like that of SW Blanton, but go a step further to add safe crossings over the railroad tracks for users to access transit. Even better but more challenging would be to work with State DOT to increase crossing options over the TV Highway.
- This something that is being imposed on our communities and will invite undesirables to our neighborhoods.
- Blanton would be safer, but if I'm commuting to work by bike, I would prefer Shaw with direct crossings for the sake of expediency.
- Shaw would have less conflicts with driving and is a less-traveled street. The street crossings will be an issue.
- This is such a tough choice. Shaw is such an eyesore but navigating those intersections as a pedestrian are HORRIBLE. If Blanton is chosen does that mean Shaw will remain a dump? And how do the Blanton residents feel about the road widening? How much of their front yard is going to turn into street and sidewalk? I've had this survey open on my PC for the last week unable to choose between the two because of these issues.
- Shaw seems like a better option but I fear we are just spending tax dollars on something that will just create a more convenient place for people to illegally camp
- We have a homeless crises that stems from down tone Portland and you want to make an easier path for people to walk and ride to and from Portland at the same time as Portland is pushing people out of down town. We need to address this first or the new

- paths will be taken over by camps and become useless. Please help get the homeless off the streets and on their feet first(enabling them doesn't help to give them a better life).
- Blanton has a lot of crime in the area, where I would worry about children seeing violence and drug use. I think a better Idea would be trail that runs directly with the train tracks.
- Shaw has to many homeless and Blantons way to busy of a road
- I prefer TV Hwy. TONS of space!
- You are simply buildings homeless camp
- I can't imagin why I would want to walk or hike in either area. Too many people and cars. I would prefer a whole different approach.
- Inviting the homeless to live along this proposed trail
- Both are high crime areas. I think they are likely to be used more than campers than recreationally. People will not feel safe.
- Put the pressure upon ODOT for itself: TV Highway AND SW CANYON ROAD. STOP
 thinking that people will somehow avoid accessing the businesses on ODOT's death
 road. Bus 57 needs dedicated bus-rapid transit or at least make TriMet WES go from
 Forest Grove to Beaverton and then on the way to Salem's downtown waterfront.
 Protected bike lanes are needed. Stop allowing drive-thrus!

Question 6: Is there anything else you would like to share with the project team as we finalize the concept for TV Trail? (Open text)

- I'd use the trail that is closest to my home. I'm not sure which one that is because there aren't any pictures on this page to compare the two trails to each other.
- Choose the SW Blanton Corridor.
- I don't understand why you would consider Blanton. Nobody should be asked to have there front yard, driveway and trees raped so people can have a slightly better way to get along. Since blanton is a residential street, its not all that bad to walk or ride on anyway.
- I'm an experienced cyclist who has been regularly riding TV Hwy for 15 years. My sensibilities are not representative.
- The TV trail is going to be a wonderful connector of places and people
- I love the pedestrian and bike trails all over our county. They're great for the community, and I appreciate the thought put into them.
- Shaw is the better alternative for bikes as it's a low traffic frontage road and adding sidewalks will hopefully clean up that area
- Can you put sidewalk/bike path on just one side to reduce property/driveway impact? In 20 yrs of walking Blanton/Shaw, I've not seen enough use to warrant sidewalk/bike path on both sides of Blanton.
- Shaw is a boring street. Blanton goes by the Barsotti park and would make this park more accessible. I am concerned when my kids bike to this park because of no sidewalks on Blanton.
- no

- Who actually determined that this project is a viable solution to the Washington County traffic solutions?
- Thank you for informing the public and soliciting our input.
- Shaw is more industrial and lacks sufficient parking now, with many cars pulling out.
 Such a remodel would have adverse impact on businesses.
- Please work with property owners. I like the Blanton section better but I feel the Shaw section should be used if it has less impact on homeowners.
- Great idea! Please build soon!
- I am quite pleased to hear about plans to do this project, as somebody who hikes often on urban trails. Another big plus for people like me who reside in the avenue roads crossing TV highway is the ability to access the Westside trail and make it easier to access the Cooper mountain trail. This is a major problem currently, as you have to walk several miles via major roads to get there, which usually kills the idea of visiting the park for me via walking there. Wanted to also add that I was really pleased to hear about being able to eventually hike all the way out to the coast from the Western suburbs. Something like this is badly needed and a wonderful idea for those of us without a car, and who have no easy way to get out there, or to the Cascades and gorge, for that matter. Possible trails to all these areas would be a vital blessing currently for many of us outdoor types who can no longer access these more wild places without major transfer, cost, and schedule issues.
- The Shaw St option is better if you can create a safe crosswalk
- I'm concerned that one of the cons on the Blanton option is convenience to TV Highway. With work on the TV intersections at Cornelius Pass, 209, Brookwood, and Century, why isn't there a more holistic approach incorporating separated bike/walk paths from Blanton up to TV on these roads? This seems like a lost opportunity to incorporate these plans now before the work on these roads/intersections gets started.
- Kill this project please
- Shaw is just plain "exposed" when walking it. It's loud and has a feeling of being congested. You have TV highway, the train tracks and businesses instead of Blanton that is more of a neighborhood setting
- I really hope that whoever is in charge of this project sends further communication To me in my neighborhood about this project. This is the first time I'm hearing of it and I'm shocked. I don't know if you will have any meetings where the public can attend but I would definitely like to join them if they were open to the public. In fact I have no problem with you contacting me at all about questions regarding this trail so near my house. My address is 4450 SW. 165th Ave.
- Would speed humps be on either of these streets to reduce speeding next to a big walking path for families to feel comfortable and safer?
- Another problem with single side bike paths is that where they cross a street or driveway, people driving are not looking for cyclists coming from the right. They are going the "wrong" way and are on the "wrong "side of the street.
- On Shaw between 160th and 185th it a very scary and ran down part of town. Would not feel safe walking on Shaw Street!!!

- I feel that Blanton option is better and comfortable because is is difficult for people not to
 cross the main streets directly. but it would be nicer for people to walk along the rail. I
 know that this is a difficult decision and whichever decision to be made, I would like to
 appreciate the decisions. thank you.
- We are hoping that there are also plans to improve the sidewalks along Kinnaman soon, especially between 185th and Farmington. So many students and children walk along that road and it's quite dangerous for them.
- Shaw will create more traffic. But its closer to me, so I will at least try it out and use it if I like it.
- I love the efforts to improve Aloha and provide safe alternative trails. The impact of North South traffic on 185th creates hazardous crossings.
- Shaw is a commercial street and has more traffic in/out of business driveways and TV
 Highway to the North is noisy. Also, Blanton needs to be improved so two birds with one
 stone putting the the TV Trail and updating/upgrading the street and neighborhood. Plus
 it passes by a school and a park that bikers and walkers can visit/enjoy as well. No parks
 or schools on Shaw.
- The biggest challenge to both of these trail proposals is that the trails are all south of the railroad / TV Highway, and points of interest are north / between the railroad / TV Highway. No matter which trail is chosen, users will still need to access transit across the railroad tracks (via grade crossings, or over unsafe areas), and cross the TV highway, at risk of vehicles turning right on red.
- SW Shaw is less residential which means fewer driveway issues. SW Shaw is closer to transit stops.
- If Shaw Street is chosen, I hope some provision for noise abatement can be made.
- Thank you! I really appreciate all the bike corridors that are being developed in Washington County. I frequently bike across Beaverton and Hillsboro to work and I give my children lots of freedom to explore by bike. The more we can make our areas accessible and safe for bikes, the more people will use them leading to better health and clean air for all. Thanks again!
- Please take this idea into consideration! https://bikeportland.org/2021/02/23/step-by-step-streets-in-hillsdale-have-gotten-safer-327039 I have ridden this route many times, and feel completely safe doing so. I believe this would be much more cost effective, and minimize property loss.
- Blanton is a community. Shaw is a business street. It may be more expensive for Blanton, but if this is about community safety, and improving the community, the choice of Blanton is clear.
- My primary concern is the safety of the children. I live across the street from Barsotti Park and it is difficult to see around all the parked cars to check for crossing safety, especially for the smaller ones. I can't tell you the number of times I've seen a kid chase a ball into the street. One-side assigned parking would greatly improve crossing safety. I'd also like to see brightly marked street bumps because another issue is speeding. I nearly got hit by a car today checking my mail just twenty minutes ago. The driver had to be doing at least thirty over, and it is only 25mph through Blanton! If getting these issues

- fixed meant giving up a bit of my front yard I'd be more than happy to comply. Thank you for your time and efforts.
- I love the idea. The Blanton really feeds in well with the new trail through the South Hillsboro Reed's Crossing, and I like that it is further away from the noise and traffic of TV highway
- Shaw is very industrial and busy. Too close to TV highway
- Don't steal peoples land and money for a trail that will be unusable because you haven't addressed our real problems like the homeless crises and the fact that we are we are just barely Coming out of a pandemic and likely into an economic slump. Please stop wasting my money for vanity projects when we have so many needs that are un met.
- There needs to be patrols along this path
- Thank yo ufor doing this! mg
- Don't understand the cost. This is not Portland things are to sprawled out here in the farm lands
- Shaw has less driveways interfering with the flow of traffic for bicycles and walkers and also has the light at 198th Ave.
- Blanton does have more destinations, but it looks like Shaw can be developed more conveniently. As long as access to destinations on Blanton is taken into consideration it should be fine.
- Shaw, but only if the intersections are built out rather than having to hop up and cross at
 TV
- Blanton st have speeders. Please put safety as top priority to make this area more walkable.
- I would prefer Shaw to limit the property impacts of the Blanton option. But I would use either one
- You do not have enough room between 198& 209 without destroying trees & stealing people's property! Stop destroying Oregon!
- Improving the aesthetics of shaw street, would also improve the aesthetics of tv highway which lacks compared to other routes in the area
- Crosswalks signals must give enough time for pedestrians to cross.. especially wheel chair users.
- Shaw street does seem like a better option with the trail next to the railroad.
- Put the pressure upon ODOT for itself: TV Highway AND SW CANYON ROAD. STOP
 thinking that people will somehow avoid accessing the businesses on ODOT's death
 road. Bus 57 needs dedicated bus-rapid transit or at least make TriMet WES go from
 Forest Grove to Beaverton and then on the way to Salem's downtown waterfront.
 Protected bike lanes are needed. Stop allowing drive-thrus!

Appendix B: Demographic Data: Zip Codes

Primary Residence Zip Codes

Zip Code Co

87006	1
97003	20
97005	1
97006	1
97007	12
97008	1
97062	1
97078	33
97116	1
97123	10
97124	6
97140	1
97223	1
97225	2
97229	3
97003 but my family	
lives on Blanton and	
Kinnaman.	1
97078-2138	1
97078-2343	1

Work Zip Codes

Zip Code	Count
97003	5
97005	6
97006	5
97007	4
97035	1
97078	3
97113	2
97116	1
97119	1
97123	7
97124	6
97201	2
97203	1
97205	1
97209	1
97210	1
97217	1
97219	1
97221	1

97223	1
97229	4
97232	1
98683	1
970782343	1

School Zip Codes

Zip Code	Count
97003	4
97006	1
97078	4
97123	2
97124	1
97219	1

Appendix C: Comments Received through May 20 Tabling

General Comments received through conversation with project staff:

- Spend money on Shaw Street.
- The crossing at Blanton and the railroad is dangerous.
- Love for Powerline Trail.
- Live on Blanton Street and am a frequent trail user and walker on both Blanton and Shaw Street. Prefer walking on Blanton to reach Barsotti Park, but there is not a lot of space to walk with kids.
- There is a need for speed reduction measures on Blanton. Neighborhood kids use Blanton to access the park and speeding cars make it unsafe for walkers.
 - o Note: need sign for "Children at play."
- Shaw Street seems easier, but Blanton is better and safer with parking on one side.
- Concerns about ROW access.
- Better sidewalks.
- Support for wider and typical designs.

Comments received through questionnaire about Shaw and Blanton corridors

- Like how neighborhood on Blanton is "one clump."
- If trail continues to be maintained, it would be great.
- Blanton for safety want to reduce speed on Blanton to make is safer for kids. There is no space to walk on Blanton.
- Shaw for convenience because it is closer to bus stop.
- Blanton currently horrendous on parks due to the new XX and can't use parking lots. Sidewalk and for biking, not hot on parking.

- Shaw is best in terms of congestion and easier parking. Shaw is less travelled than Blanton. There are trains three to four times a day and they last for 10-15 minutes. It is inconvenient.
- 170th much more room.

General comments received through questionnaire:

- Many bikes on River Road, Shaw is too busy, Blanton is quieter but there are more property impacts.
- Challenges with easement on Blanton for a relatively low volume of use.
- Blanton preference as there is a park nearby.
- Both options are busy, and it would be nicer to have a safer spot or options for my kids.
- Don't really use Blanton or Shaw but do use the Westside Trail. Questions about the westside trail.
- Safety is important.
- It's hard to walk/run on Blanton. Not a lot of sidewalks. No need for specific bike section

 ok with a mixed-use path. Connection to Hillsboro would be great. Blanton seems
 more realistic. Shaw is more accessible to businesses, too dangerous today.
- Preference is for Shaw initially but would like to see Blanton be the trail with an improved connection to the Westside Trail at 170th. Want bike accommodations on Blanton. Rides Shaw today because Blanton isn't safe. Don't ride on westside trail when it is nice because the trail traffic is too busy.
- Canyon and Farmington roads are too busy to ride on the bike lanes, so it depends on where he would feel safe using bike lanes.
- Speed bump
- Concerned for the children's safety on Blanton Street. I am willing to give up some of my front yard for the kids.
- Sidewalks (Spanish) x2
- Concerns about Blanton ROW/private property
- I travel along both corridors every day and use them with a car. Ride bikes around here also a lot. Happy you're trying to improve the area.
- People speed and don't live on Blanton.
- 160th cut through easier on Blanton
- 158th avoid with Blanton.
- Like the idea of an extension to trail
- Concerns about safety
- Would like to accommodate bike lane, should fix the street/sidewalk.



June 11, 2021

Dyami Valentine, Senior Planner Washington County Department of Land Use & Transportation Planning & Development Services - Long Range Planning 155 N. First Avenue, Suite 350 MS14 Hillsboro, OR 97124

Re: THPRD Comments on the Draft Tualatin Valley Trail Concept Plan

Please accept the Tualatin Hills Park and Recreation District's (THPRD) comments on the Draft Tualatin Valley Trail (TVT) Concept Plan presented at the June 7th, 2021, Tualatin Valley Trail Technical Advisory Committee (TAC) meeting.

THPRD Support for the Tualatin Valley Trail

THPRD supports Washington County's effort to create a turf-to-surf trail system that centers use by the local community and incorporates Feasibility, Safety, Connectivity, Health/Livability, Coordination, and Equity as key project goals. These goals align well with the values expressed by THPRD's Board of Directors in the Mission, Vision and Diversity, Equity, Inclusion and Access (DEIA) statements, as well as the trail development priorities detailed in our 2016 Trails Functional Plan.

Concept Plan Comments

The TVT Concept Plan presented on June 7th advances two alignment options for future consideration, refinement, and improvement. The first alignment follows SW Blanton Street between SW 160th and SW 209th Avenues. The second alignment follows SW Shaw Street between SW 160th and SW 198th Avenues and then detours to SW Blanton Street between SW 198th to SW 209th Avenues. The SW Shaw Street alignment also contemplates a potential long-term future alignment that would remove the SW Blanton Street detour and continue the trail from SW 198th Avenue, passed SW 209th Avenue to SE Cornelius Pass Road in Hillsboro.

If Washington County seeks to advance both the SW Shaw and SW Blanton alignment concepts, THPRD believes that the tone used to discuss these alignments should read neutrally. Despite the plan's rich discussions of trail and street cross sections, intersection crossings, and traffic considerations; the challenges facing the SW Shaw alignment are readily discussed in section eight, whereas discussion of challenges facing the SW Blanton alignment in section seven appear more peripheral. THPRD believes that if Washington County intends to focus future refinement and improvement efforts on both alignment corridors, the tone with which each alignment is discussed should be neutral.

Additionally, THPRD believes that a more robust discussion of the SW Blanton alignment's land acquisition challenges would enrich the concept plan by clarifying the potential impact of developing that alignment. During the June 7th presentation and in previous TAC meetings, land acquisition challenges along the SW Blanton alignment corridor were frequently discussed; however, they appear less present within the TVT Concept Plan narrative. THPRD believes engaging with this discussion more fully within the TVT Concept Plan will help future planning and improvement efforts advance more smoothly by helping members of the public better understand potential impacts from developing the SW Blanton alignment.

Finally, THPRD believes future TVT Concept Plan users would benefit from expanding the next steps and implementation discussions in sections nine and ten. Providing a more in-depth discussion of implementation steps, timelines, and potential funding sources would help partner agencies coordinate with Washington County on planning and development. Additionally, this clarity would allow community members to better track and engage with implementation efforts as they move forward. THPRD believes that these benefits could help the alignments identified within the TVT Concept Plan be realized more quickly; expanding safe, comfortable, and low-stress access to active transportation networks for Aloha residents and the region.

Future Design Recommendations

Should the SW Shaw Street alignment be developed or designs for the SW Blanton Street alignment be revisited, THPRD recommends the TVT be built in accordance with the attached Regional Trail Design Standards outlined in section 4 of the THPRD Trails Functional Plan.

Sincerely,

Peter Swinton

Planner II, Tualatin Hills Park and Recreation District

CC: Jeannine Rustad, JD, Planning Manager, Tualatin Hills Park and Recreation District; Sheri Wantland, Nature and Trails Advisory Committee Member

Attachment: THPRD 2016 Trails Functional Plan Trail Design Standards

4.1 TRAIL DESIGN STANDARDS BY CLASSIFICATION

A complete trail network provides a variety of experiences within a range of settings. THPRD's system includes routes that provide recreational opportunities as well as alignments that present viable transportation alternatives for bicycle commuters. The system includes three main functional classes of trails:

- » Regional Trail
- » Community Trail
- » Neighborhood Trail

See Section 3.1.2 above for definitions of the trail classifications. Table 4A below provides guidance on trail design based on classification and Figures 4A through 4C illustrate a typical trail cross-section for each trail classification.

FIGURE 4A
Regional trail typical section

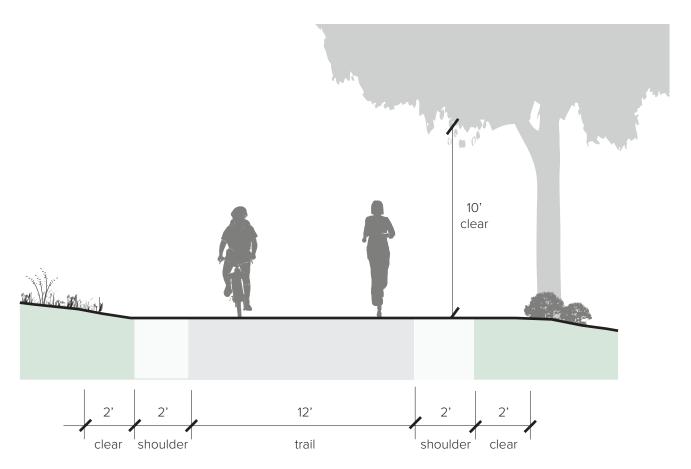


FIGURE 4B
Community trail typical section

FIGURE 4C
Neighborhood trail typical section

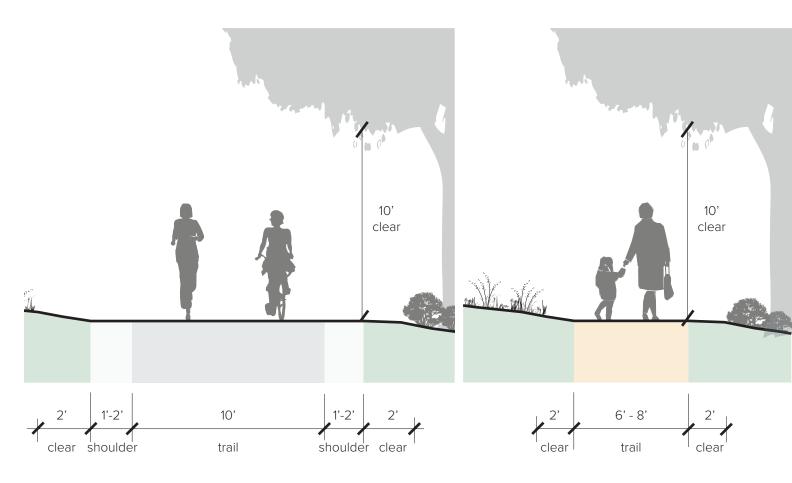


TABLE 4A TRAIL CLASSIFICATION DESIGN MATRIX

Classification	Function	Materials	Width	Vertical Clearance*	Horizontal Clearance**
Regional	Provides transportation and recreational connectivity at a regional scale	Paved (asphalt or concrete); may be pervious	12 feet with 2 foot gravel shoulder	10 feet (from top of trail)	2 feet (from edge of shoulder)
Community	Provides recreational and transportation connectivity at a community scale	Paved (asphalt or concrete; may be pervious)	10 feet with 1-2 foot gravel shoulder	10 feet (from top of trail)	2 feet (from edge of shoulder)
Neighborhood (Urban)	Provides access or a parallel route to higher level trail facilities	Paved	6-8 feet, with or without gravel shoulder	10 feet (from top of trail)	2 feet (from edge of shoulder or trail w/o shoulder)
Neighborhood (Natural)	Linear natural spaces typically following riparian corridors	Varies depending on site conditions	6-8 feet, no gravel shoulder	10 feet (from top of trail)	2 feet (from edge of trail)

^{*}Area above the trail free from obstructions such as tree limbs or branches

^{**}Area on both sides of trail free from obstructions such as shrubs and trees

TABLE 4B ADDITIONAL TRAIL TYPE DESIGN MATRIX

Classification	Function	Materials	Width	Vertical Clearance*	Horizontal Clearance**
Combined Trail and Sidewalk	Provides route options for both bicyclists and pedestrians outside of existing roadway corridors	Paved (asphalt or concrete)	12 feet (sidewalk and trail)	10 feet (from top of trail)	2 feet (from edge of trail)
Trail Adjacent to a Road or Sidewalk	Separated route within a transportation corridor	Paved	Regional Trail: 12 feet; Community: 10 feet	Vertical curb between trail and roadway; 10 feet (from top of trail)	4 feet landscape buffer between trail and roadway/ sidewalk; 4 feet (from edge of trail) - non- landscape buffer side)
Trail in a Greenway	Provides route for both pedestrians and bicyclists using riparian corridors and/or wetland areas	Paved or unpaved	6-8 feet; should include a vegetated buffer zone from adjacent water bodies	10 feet (from top of trail)	2 feet (from edge of trail)

^{*}Area above the trail free from obstructions such as tree limbs or branches

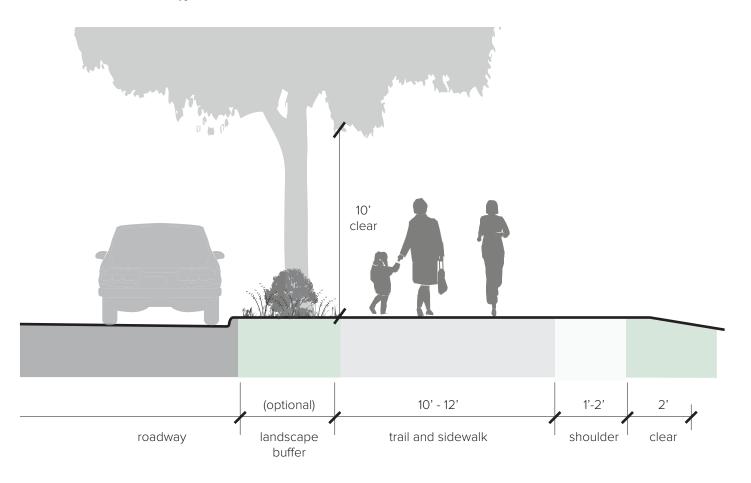
 $[\]hbox{**Area on both sides of trail free from obstructions such as shrubs and trees}$

4.2 ADDITIONAL TRAIL TYPE DESIGN STANDARDS

Trails of each classification traverse many types of environments and contexts. The standards in Table 4B provide guidance for some common trail types, based on site context.

Any new or improved sidewalks should adhere to the requirements of the City of Beaverton or Washington County, as appropriate. The district should partner with both agencies as road improvements are being planned along trail corridors to help ensure bicycle and pedestrian needs are adequately met.

FIGURE 4D
Combined trail and sidewalk typical section

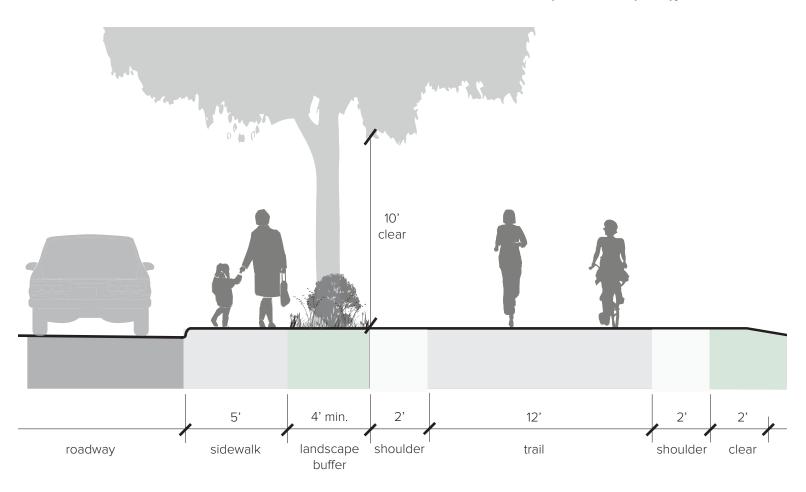


4.2.1 Combined Trail and Sidewalk

Shared use paths are completely separated from motorized vehicular traffic and are constructed in the public right of way, within a green space area, public utility corridor or other public access area. Combined sidewalks and trails are generally located adjacent to roadways within the public right of way. They may be separated from the curb by a landscape buffer or they may be "curb-tight," connected to the curb.

Trail design standards for these types of facilities are described in the table above. Additional consideration should also be given to enhancing the user experience and safety for both bicycles and pedestrians, including the use of striping, landscaping, clear sight lines and other design considerations described later in this section. Figures 4D and 4E illustrate typical cross-sections for these two trail types.

FIGURE 4E
Trail adjacent to a roadway, trail typical section







4.2.2 Trails within Greenways

Due to much of the district's service area being urbanized, limited opportunities are available to develop new off-street trails. Much of the district's remaining (to be constructed) regional and community trail system is located within environmentally sensitive areas, such as creek corridors and greenways. Greenways are defined as follows:

Greenways are linear natural spaces that follow creeks and streams. Some greenways provide public access with environmentally compatible trails, viewpoints, or watercraft launch sites. Other greenways prioritize wildlife habitat protection and do not allow any public access. (Metro, Regional Trails and Greenways Plan)

Greenways offer substantial recreational and green space preservation opportunities. When planning for a trail along or in a greenway, a balance must be provided between the protection of natural resources and the public's desire for access to natural resource areas. Trails within greenways should be studied to identify impacts to natural resource areas, stormwater, flora and fauna, and flood levels as well as recreational and transportation benefits for district residents.

As mentioned previously in this TFP, the trail system map (Figure 3C) highlights study areas where trails are planned to be located along or within creek corridors. This includes trails such as Beaverton Creek, Bronson Creek, Willow Creek and others. Section 3.2.3 outlines the process of how these study areas will be evaluated using both trail prioritization criteria outlined in this plan and the site development suitability criteria outlined in the district's NRFP.

The following principles provide some general environmental considerations for trail development within greenways:

» Consider

- Alignments to minimize the number of stream crossings
- Circulation and/or migration of local fauna
- Impact of on-site vs. off-site mitigation
- Opportunities for the restoration of poor water quality, habitat areas and/or stream edges
- Interpretive or educational elements to highlight local features, flora and fauna
- Use of concrete as a surface treatment option for trails in greenway due to its durability and lower maintenance requirements
- Natural dispersed infiltration systems such as vegetated swales or infiltration strips to manage stormwater
- Construction materials with little to no toxicity (see http://www.pharosproject.net)

» Avoid

- Fragmentation of small habitats
- Wetlands whenever possible, but if necessary span at the narrowest point
- Constructing trails that may be more prone to erosion and maintenance upkeep over time
- Use of pervious paving in floodplain areas or areas without proper drainage due to sedimentation and higher maintenance requirements
- » Maintain buffer zones (vegetated corridors) from creeks, streams and sensitive bodies of water per Clean Water Services standards





4.3 DESIGN EXCEPTIONS

The design standards and guidelines outlined in this section are the district's best practices and basis for design of all planned trails. However, trail development requires consideration of the local context, project site conditions, the environment and jurisdictional requirements.

During the master planning and design development process, the district will consider alternatives to the standard width dimensions, turning radii, surface treatments and other elements when justification is provided to address the following factors:

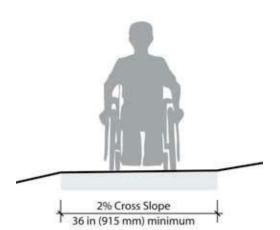
- » User safety
- » Avoidance of and/or minimizing environmental impact
- » Consideration of topography
- » Demand and anticipated level of use
- » Cost
- » Regional or local jurisdictional guidance, such as Metro's Active Transportation Plan

Generally, trail widths less than the standard are only to be used over short distances, such as around utility poles, bridge abutments, significant trees or in sensitive natural resource areas. Trail widths greater than the standard width may also be considered in high use areas, such as near commercial centers, transit, schools and recreation facilities. Design exceptions may require approval by the district's management team.



4.4.1 ADA

The Americans with Disabilities Act (ADA) was established to prohibit discrimination on the basis of disability by public accommodations and requires places of public accommodation and commercial facilities to be designed, constructed and altered in compliance with the accessibility standards established by the ADA. As new trails are developed and existing trails are enhanced, the district will work on meeting ADA requirements to ensure access for all.



4.4.2 ADAAG

The United States Access Board has approved the Americans with Disabilities Act Accessibility Guidelines (ADAAG) for trails and outdoor recreational access routes. However, some trails may have limitations that make meeting ADAAG guidelines difficult or prohibitive. Prohibitive impacts include harm to significant cultural or natural resources, requirements of construction methods that are against federal, state or local regulations, or terrain characteristics that prevent compliance.

Some key ADAAG guidance considerations include:

- » Use of firm and stable surfaces, such as asphalt, concrete, wood, recycled plastic lumber or compacted gravel, wherever universal accessibility is a consideration
- » Provide clear tread width a minimum of 3 feet
- » Provide a 5 foot wide passing space at a minimum of every 1,000 feet when the trail width is less than 5 feet wide
- » Avoid surface obstacles more than one-half inch high, or 2 inches high when the surface is other than asphalt, concrete wood or recycled plastic lumber
- » Avoid a cross slope more than 2%, or 5% where the surface is not asphalt, concrete, wood or recycled plastic lumber when necessary for drainage
- » Longitudinal slope must meet one or more of the following conditions shown in Table 4C
- » Provide detectable surface changes at curb ramp approaches from roadways or parking areas
- » Provide one accessible parking space per every 25 vehicle spaces at trailheads
- » No more than 30% of the total trail length may exceed a running slope of 8.33%

TABLE 4C MAXIMUM RUNNING SLOPE AND LENGTH

Runnin	Maximum Length of Segment			
Steeper than	But no more steep than			
1:0 (0%)	1:20 (5%)	No Limit		
1:20 (5%)	1:12 (8.33%)	200 feet		
1:12 (8.33%)	1:10 (10%)	30 feet		
1:10 (10%)	1:8 (12%)	10 feet		

 $ADA\ Accessibility\ Guidelines\ (ADAAG),\ ADA\ Standards,\ https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/adaag$



4.5 REGULATORY

4.5.1 Oregon Department of Transportation (ODOT)

ODOT has adopted the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities for trail design standards. The AASHTO guide should be consulted for geometric design standards such as horizontal and vertical curves, and sight-distance. This is especially important for those trails serving a transportation function, such as regional trails. Any trail projects receiving federal funding assistance will be required to meet ODOT standards in its design and development.

4.5.2 American Association of State Highway and Transportation Officials (AASHTO)

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of trails along roadways. These facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding when either entering or exiting the trail. As mentioned above, AASHTO provides guidance for the geometric design of trail design and construction. These standards should be considered for all trail projects and are required to be met for all federally funded trail projects.

4.5.3 Manual of Uniform Traffic Control Devices (MUTCD)

The MUTCD regulates the design and use of all traffic control devices including signs and pavement markings. A summary of the MUTCD guidance for trails and bicycles includes the following:

- » Use of a solid yellow line when passing is discouraged
- » Use of a dashed yellow line when passing is permitted due to adequate conditions
- » Use of striping in areas of restricted sight-distance, substandard trail width, high traffic areas, intersection approaches and/or where night time riding is expected with limited lighting
- » Avoid over-striping trails in order to maintain effectiveness for trail user safety purposes
- » Any transportation related signage (regulatory, caution, directional, etc.) visible from roadways or other public right of way must meet MUTCD standards

Please note that the district's Trails Management Program contains more detailed information related to MUTCD guidance and how the district puts this guidance into practice along the trails system.

4.5.4 Utilities

Many types of utilities, such as water, gas, electric and others offer good opportunities for trail co-location. Recreational and utility couse has some complications, including the unique needs of the utility company or public agency. However, with strategic maintenance and land agreements, utilities can have a minimal effect on trail users. Additionally, utility companies usually benefit by having an uninterrupted and easily accessible route to their utility service.

Each utility has specific requirements regarding trail routing, alignment, setbacks, loading, landscaping and other factors. For each project all utilities should be coordinated with to ensure current requirements are being used as well as to better understand utility maintenance schedules and servicing needs, including frequency and vehicle/equipment requirements. Limitations may be placed on trail surfacing materials and location of structures, such as bridges and boardwalks, depending on utility type and location.

The district works with the following utility providers on many of its trail projects:

- » Bonneville Power Administration (BPA)
- » Portland General Electric Company (PGE)
- » Northwest Natural Gas (NWN)
- » Tualatin Valley Water District (TVWD)
- » Clean Water Services (CWS)
- » City of Beaverton
- » City of Portland

4.5.5 Railroad / TriMet

As with utilities, some of the district's trails are, or will be, located in right of way owned by Union Pacific Railroad and operated by Portland & Western Railroad or owned and operated by TriMet. As such, coordination with each of these agencies is needed to ensure their respective requirements are being met. Because most of these are live railroad right of ways, additional safe guards must be considered when design and constructing trails. This includes consideration of the following:

- » Use of fencing and/or other separation techniques should be part of the trail design when adjacent to railroad tracks
- » Maximize the setback between the trail and the railroad tracks to the greatest extent possible; subject to railroad, federal, state and regional guidelines

4.6 SURFACING

When determining surface type for THPRD trails, consider topography, landscape context, underlying soils, trail type and classification. Asphalt is the preferred standard for all regional and community trail surfacing, but alternative trail surfacing may be allowed with a design exception. All surfaces have advantages and disadvantages, and each must be analyzed to determine which surface is most appropriate in any given location.

4.6.1 Impervious

Traditionally, asphalt and concrete are the most commonly used materials for trails because they last the longest, meet ADA and ADAAG requirements and meet the needs of most users. Other possible trail surfacing options include:

- » Commercial soil stabilizers
- » Geotextile confinement systems
- » Crusher fines
- » Limestone treated surfaces
- » Recycled plastic or wood decking

Surfacing options for bridges and boardwalks are identified in Section 4.8.3.

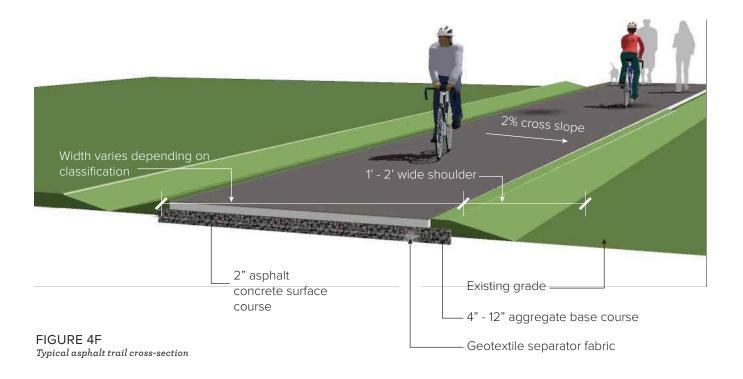
In arriving at a recommended trail surface, the following should be considered:

- » Initial capital cost and funding
- » Long-term maintenance costs
- » Surfacing durability and longevity
- » Existing soil and environmental conditions
- » Availability of materials
- » Anticipated trail use/functionality
- » Aesthetics

ADA and ADAAG-compliant trails require paved surfaces, in most instances, for access and ease of use. In limited cases, packed gravel fines can be used, where there is little to no topography. However, packed surfaces require much more maintenance effort and cost over time, and may not be desirable in the long term.

Asphalt

Asphalt trails offer substantial durability for the cost of installation and maintenance. Asphalt is popular with users for its smooth, continuous surface and has the benefit of lower cost, but requires more upkeep in comparison to concrete. As a flexible pavement, asphalt can also be considered for installing as a paved trail in a greenway or with grades steeper than three percent. If constructed properly on suitable sub-grade, asphalt has a life span of ten to 15 years. The use of asphalt for trails is the district's preferred standard.



Concrete

When cost allows, concrete is recommended because of its durability, longevity and lower maintenance requirements. Concrete is especially good in areas prone to frequent flooding, such as greenways. However, the hardness and jarring effect of this surface is not preferred by runners or cyclists. Concrete joints that are saw-cut rather than tooled tend to improve trail user experience. If constructed properly on suitable sub-grade, concrete has a life span of approximately 25 to 30 years.

4.6.2 Pervious / Permeable

The use of permeable paving when feasible supports the district's sustainability policy and has a number of positive environmental impacts, include lower storm water runoff and greater water infiltration rates. However, permeable paving is generally twice the cost of impervious materials to install and is recommended when site conditions are conducive to its use. As permeable paving continues to evolve and improve, the district will continue to evaluate its potential use in the trail system. The following should be considered for its use:

- » Conduct a feasibility study to determine site conditions and soil type
- » Environmental factors, such as the proximity to tree canopies or soil debris
- » Establishment of a regular and routine maintenance schedule to retain permeability, access for vacuuming debris and cleaning equipment, especially after storm events
- » Areas with proper drainage (not suitable in floodplain or areas with ponding or sedimentation)

4.6.3 Soft Surface

For purposes of this plan, natural surface trails are limited to bare earth (soil), gravel or crushed rock. Additional information about soft surface trails can be found in the district's PFP. When using crushed rock or gravel, trails in greenways benefit from screenings that contain about 4% fines by weight to compact and stabilize the trail's surfacing over time. However, an alternative surface should be considered when designing in flood-prone areas or steep terrain. When using soft surface trails:

- » Provide constant positive drainage to avoid ponding
- » Bench cut trail into slope without extensive removal of existing vegetation; build grade reversals and out-sloped elevations to encourage sheet flow across the trail
- » Design small-scale stormwater facilities along the trail to minimize erosion
- » Provide a longitudinal slope of 5% and a cross slope of 2%
- » Keep the trail available for year round use





4.7 AMENITIES

Amenities help distinguish district trails from others and help to enhance the trail user experience. This includes features such as site furnishings, bollards, signage, striping and fencing. It should be noted, however, that these amenities will not always be found along all district trails due to site constraints, trail classification, anticipated trail use and other factors. The following design guidelines for typical district trail amenities are intended as a tool for decision-making purposes related to new trail design or the enhancement of existing substandard trails.

4.7.1 Site Furnishings

Although district trails are regularly maintained and monitored, it is advisable to use vandal resistant construction and materials whenever possible. Site furnishings typical to district trails are highlighted as follows:

» Seating

- May include benches, seat walls, boulders, logs or other built features
- Typically located at trailheads, mid-block crossings, wildlife or natural area viewing locations and other areas of interest
- Provide adequate space for strollers and wheelchairs in a manner that does not impede trail use
- Seat walls shall include skate deterrents as appropriate

» Trash receptacles

- Preferably located at trailheads and mid-block crossings; may be considered near wildlife/natural area viewing locations if high use is anticipated
- Should not be located directly adjacent to benches and seating areas
- Should be located for ease of maintenance service and access

» Bike racks

- Typically located at parks along trail corridors, trailheads and where restrooms are located
- Should be located in a manner that does not impede trail use

» Drinking fountains and port-a-potties

- Preferably located at trailheads and parks along trail corridors; may also be considered near mid-block crossings if other locations are too far away
- New drinking foundations should include pet bowl and jug filler options
- Consider locations for ease of maintenance service and access

» Doggie bag dispensers

- Typically located at trailheads, mid-block crossings and near trash receptacles
- Mount on post with rules sign or on other surface as appropriate

» Kiosks

- Typically located at major trailheads or trail intersections
- Design adjacent to the trail near other site furnishings, such as a bench or trash receptacle

» Artwork

- Should be considered in the overall design of a trail project, as appropriate, and can be incorporated as part of the site furnishings (benches, bike racks, kiosks, etc.); as trail elements (bridge, boardwalk, walls, etc.); as stand-alone features (sculpture, mural, etc.); or as educational features (interpretive elements, environmental features, etc.)
- Consider using local artists to provide works that make the trail network uniquely distinct and representative of the district's character









4.7.2 Bollards

The use of bollards along district trails is intended to discourage motorized modes from using them. They are also used to distinguish district trails from trails provided by other public agencies (like school districts or cities) and private groups (like homeowner associations or golf/athletic clubs). The types of bollards used by the district and their unique characteristics are highlighted as follows:

- » May include permanent, removable, collapsible or other site elements, such as boulders or logs
- » Typically located at trailheads, mid-block crossings, maintenance access points and any other access point where vehicles may access the trail

» Bollards are generally installed in groups of:

- Two with removable or collapsible bollards
- Three with two permanent bollards and one removable or collapsible bollard
- » Bollards are typically yellow in color and should consider the use of reflective tape

» Permanent

- Typically used on regional and community trails
- Locate in the gravel shoulder; where no shoulder exists, should be located 1-2 feet from edge of trail

» Removable / Collapsible

- Typically used on regional, community and neighborhood trails
- Located at trail centerline when used with permanent bollards on regional and community trails
- Locate at trail centerline when natural features create side barriers for neighborhood trails

» Boulders / Logs

- Typically located along street frontages at mid-block crossings, trailheads with parking areas and other potential unauthorized vehicle access points
- Often used in combination with bollards, especially if boulders are available on site or from another project
- Space uniformly to discourage vehicle entry but still allow for mowing and smaller sized maintenance equipment

4.7.3 Signage

All signage proposed along trails shall adhere to the district's approved Signage Master Plan. All signs visible from the public right of way must conform to MUTCD standards and guidelines, especially those signs that are directional and regulatory in nature. The district is also a partner in Metro's Intertwine Regional Trails Program, which provides guidance for identification and wayfinding signage for the interconnectedness of regionally significant trails, parks, natural areas and green spaces of the greater metropolitan area. The following list represents signage most commonly found throughout the district's trail system. Table 4D provides guidance for locating these typical sign types found along trails.

- » Site Identification Type A Sign Family
- » Trailhead Identification Type D Sign Family
- » Regulatory Type R Sign Family
- » Directional and Safety Type T Sign Family

» Identification

• Signs may include the Intertwine designation per Metro's Intertwine Regional Trails Signage Guidelines

» Regulatory

- Typically includes the R1 sign type at all trail sites, although other regulatory signs may be applicable
- R1 signs are typically located at all trailheads, mid-block crossings and all other trail entries and can be combined with A3 signs and doggie bag dispensers as appropriate
- Any other regulatory sign types are to be located at the appropriate location(s) within a trail corridor
- Follow AASHTO and MUTCD guidelines for signs at mid-block crossings and trail intersections

» Directional and Safety

• Follow Metros Intertwine Regional Trails Signage Guidelines

» Educational

- Typically includes interpretive signage, although other signage may be applicable
- Interpretive signs are typically used when unique site features or educational characteristics exist; any such signage must adhere to the district's interpretive signage program as administered by its Natural Resources & Trail Management department.



TABLE 4D TRAIL SIGNAGE LOCATIONAL GUIDELINES

Level of
Visibility
(High to
Low)

Sign Type	Type of Location	Site Placement	Comments		
Large ID Sign: A2	Oriented towards automobile driver	Main entrance OR prominent road location	Arterial street		
Standard ID Sign: A1	Oriented towards automobile driver	Main entrance OR prominent road location	Minor collector OR neighborhood street		
Trail ID Sign w/ map: D2	Major pedestrian entry point/trailhead/ existing park (ex: light rail station, parking lot)	On right side of trail	Requires orientation map		
Trail ID Sign: D1	Regular pedestrian entrance off arterial street	On right side of trail at a minimum of 10 feet inside trail OR at the apex of the "T" intersection if appropriate	Include directional strips with distance to prominent feature or trail connection		
Small ID/Rules Sign: A3/R1	At minor entry points, including street crossings	On right side of trail	Rules must be displayed at all entry points		
Trail Connection: T3	Where patron must exit trail and use on-street/sidewalk routes to close a gap in trail	On right side of exiting trail.	Requires connection map		
Pedestrian Directional: T5	Major directional at an internal trail intersection OR split	Placed at the apex of the "T" or "V" intersection			
Trail Directional: T1	Minor directional at an internal trail intersection OR split	Placed at the apex of the "T" or "V" intersection	Visible/useful for users coming from different directions		
Trail Crossing: T4	Where trail makes direct connection across the street	On right side of trail where patrons cross	Must meet MUTCD standards		

4.7.4 Striping

The use of striping is based on the district's Trails Management Program. However, trail projects that are federally funded will be required to follow AASHTO and MUTCD guidelines. The intent of the district's striping protocol of trails is to promote trail user safety by mitigating substandard trail conditions such as trail narrowing, limited sight-distance or sharp curves. It is not THPRD's intent to stripe all the trails throughout the district.

4.7.5 Fencing / Railing

Fences or railings along trails may be needed to prevent access to/from high-speed roadways or to provide protection along steep side slopes and waterways. Fences should only be used where they are needed for safety reasons. They should be placed as far away from the trail as possible; with a minimum offset of two feet. Many of these principles apply to cut-sections of trail where retaining walls are required: minimum two feet offset, with a rub-rail whenever possible. Whenever fencing or railing is used in a trail corridor, the following fencing types should be considered:

» General considerations

- The district does not install fencing for property owners; in instances where it is required, the district shall place such fencing on the property owner side of the property line and the property owner is responsible for fencing after installation
- The district does not install fencing to delineate natural area boundaries unless deemed necessary by the Natural Resources & Trail Management department
- Fencing should be located within a mow strip as deemed necessary by the Maintenance Operations department regardless of fencing type

» Split-rail

- Preferably used for site boundaries, natural areas and safety; it is the district's preferred fencing type in most situations where delineation between activities or uses is needed
- When used for site boundaries, fencing should be placed on district side of the property line for ease of maintenance
- Generally 3-4 feet tall, having two rails; fences having three rails are considered "heavy duty"
- · Consider along trails having steep downhill slopes or at top of retaining walls
- · Locate within a bark mulch mow strip as appropriate





» Chain-link

- May used for site boundaries and safety
- Generally 3-6 feet tall depending on situation
- May be galvanized or vinyl-coated depending on location; where vinyl-coating is needed, it should be black
- · Consider use of privacy slats as appropriate

» Welded wire or field fencing

- Typically used for natural areas
- Generally 2-5 feet tall
- Consider along natural areas where access by park users are not desired, such as mitigation or restoration areas
- Generally used on a temporary basis

» Ornamental / Decorative

• Ornamental or decorative fencing may be considered in those instances where a higher level of design is desired, such as main trailheads located at parks or other district facilities

» Safety railing

- Typically used along boardwalks, top of retaining walls and steep slopes where the trail surface is 30 inches or more above ground surface
- Minimum height of 42 inches
- Openings in the railing must not exceed 4 inches in width
- Where a cyclist's handlebar may come into contact with a fence or barrier, a smooth, 12 inch wide rub-rail should be installed at a height of three feet

4.7.6 Landscaping

Generally THPRD does not design or install landscaping as part of a trail project unless it relates to mitigation. However, in some situations trail projects and residential developments are combined that require aesthetic landscaping. Use of native and drought tolerant species should be considered whenever possible, especially in locations where irrigation is not provided.

» Locations

- Typically located at trailheads and where separation is needed between the trail and other uses, such as roadways, sidewalks and pathways
- Shall include native and drought tolerant plant species as appropriate, but may include ornamental plant species where irrigation is available
- Trees to be planted no closer than 10 feet from the edge of trail surfacing
- Shrubs to be planted no closer than 5 feet from the edge of trail surfacing
- Groundcovers and grasses to be planted no closer than 3 feet from the edge of trail surfacing
- Existing landscaping and trees must be protected and incorporated into trail development/enhancement whenever possible

» Ornamental grasses

 Generally require minimal maintenance once established and are typically used in landscape buffers separating the trail from roadways and sidewalks

» Groundcovers

- Generally require minimal maintenance once established and are typically used in landscape buffers separating the trail from roadways and sidewalks.
- Typically used in areas where turf grass is not appropriate, such as on steep slopes, and landscape buffers separating the trail from roadways, or sidewalks.

» Shrubs

 Consider native plant species along park boundaries, natural areas and other locations where buffers are needed

» Trees

- Avoid the use of trees having excessive litter and debris
- Consider a tree's ultimate size and growth habit to ensure proper placement for trail designs
- Consider using root barrier in areas where existing trees are located closer than 10 feet to the edge of trail and/or when a large number of trees will be planted
- Refer to the local jurisdiction street tree guidelines for trees to be planted along trails, sidewalks or rights of way

» Low maintenance guidelines

- Avoid the use of plant species that produce excessive litter and debris, such as fruit, pods or cones
- Avoid the use of plant species susceptible to wood rot, disease or limb breakage ("weak wooded") in areas of high trail use
- Avoid siting plant species that overhang trails or have root systems that could impact trail surfaces

4.8 BRIDGES AND BOARDWALKS

Bridges and boardwalks are structures that span over sensitive natural areas or inundated waterways to limit potential environmental impact. They are typically used when crossing small creeks and wetlands. Boardwalks range in length and can span as little as 10 feet or stretch for longer distances depending on site conditions. Bridges are used where greater lengths are required to span sensitive areas or when the objective is to reduce impacts to the floodplain.



FIGURE 4G
Typical bridge/boardwalk cross-section.

Bridges and boardwalks are commonly constructed of wood, steel or concrete with recycled plastic components. Wood is the most cost effective, versatile and relatively easy to install. Special consideration must be taken when using pressure treated lumber over waterways. While steel is a more expensive option, it can be purchased as a prefabricated kit, and can expand extensive lengths where other materials cannot. Modular concrete boardwalk systems are gaining popularity due to their low-impact installation methods and durability within wet areas. Recycled plastic is popular for its material durability, but is typically limited to non-bearing uses such as decking and handrails. Bridge and boardwalk designs must consider the intended use and be built from materials that is aesthetically and structurally appropriate.

4.8.1 Boardwalks

General considerations for the use of boardwalks include:

- » Clear span width must be a minimum of 14 feet for regional trails and 12 feet for community trails. Wider widths are preferred in areas with higher anticipated use and whenever railings are used
- » Use of a 6 inch curb rail is recommended. A 42 inch guardrail is required at locations where there is a 30 inch or greater elevation difference in the boardwalk surface and the ground/water surface below
- » Design to structurally support 5 tons of capacity depending on emergency vehicle access and maintenance requirements
- » Evaluate footing types to include uplift as well as loading consideration for flood events.
- » Consult a structural engineer for member sizing, headwall and post footing design
- » Give careful consideration to selection of decking material to minimize slippery conditions (see Table 4E)
- » Follow all local, state and federal permitting requirements where boardwalks are located within wetlands; construction in wetlands is subject to jurisdictional regulations



4.8.2 Bridges

Bridges are most often used to provide user access over natural features such as streams, creeks and wetlands, where a boardwalk is not an option. The type and size of bridges can vary widely depending on the trail location, site conditions and jurisdictional requirements.

The biggest factor in determining the width and load capacity for trail bridges, as well as boardwalks, is the project requirements and the maintenance program , including emergency/ security access. A developed site and maintenance access determines trail widths and bridge/boardwalk capacity. The funding source is also a determining factor, since federally-funded trails must adhere to the most stringent design standards.

Below is a list of general guidelines for the design of bridges for future trail projects. Many of these considerations are also applicable to design of boardwalks.

- » When constructing a federally funded project, design criteria for the width of bridges are established by AASHTO
 - Standard width: 14 feet, unless a design exception is granted
 - Standard for a 'live load' for pedestrian and bicycle bridges: 85 psf (pound per square foot), plus any additional vehicle loading when used by maintenance or emergency/security vehicles
 - For bridges greater than 10 feet wide, the vehicular design load is for an HS10 truck
 - Bridges must also be designed to resist lateral forces from wind and earthquake as described by AAHSTO

» Projects funded from other sources:

- Bridge width for regional and community trails: 2 feet wider than the paved trail approaching the structure
- In special situations, a design exception is required in order to allow the width of a bridge to match the width of the trail connecting to it. Refer to Section 4.3 above for additional information about design exceptions

- » Vehicle-rated bridges will only be specified when they are justified for maintenance, emergency or security access. The justification will be dependent on the site and maintenance program. If determined to be used for vehicle access, a bridge should generally be able to support the weight of a light duty emergency vehicle
- » A goal of the district is to reduce, restrict and limit the need for maintenance vehicle access over bridges by placing trash receptacles and other 'high maintenance' site amenities close to the main access points
- » If maintenance or emergency/security staff need access to a site's interior, make sure the trail intersections have wide radii and gentle turning movements; i.e., no 90 degree turns or 'T' intersections
- » Provide a minimum of one 8 foot wide trail to one end of a bridge or boardwalk for routine maintenance
- » If site amenities or structures are in a site's interior and will require vehicle access for routine maintenance (e.g., play equipment, shelter, bridge/boardwalk, sport court, etc.) then a trail with adequate width and proper load capacity must be provided
- » Adjust maintenance service delivery measures and design the site to reduce vehicle trips or access into the site's interior
- » Some sites may have reduced trail widths or surfacing modifications to meet the intent of the NRFP, which calls on staff to: "Plan, provide and manage appropriate maintenance access routes, where required, that minimize impacts to natural resource areas by designing them with minimal impervious surfaces and widths."

4.8.3 Materials

The district has traditionally used natural wood for its bridges and boardwalks. Over the past several years, the use of recycled plastic lumber has been used in an effort to be more sustainable. Other materials may also prove to be useful, depending on site conditions, costs and other factors. The following matrix in Table 4E can be used to determine an appropriate surfacing treatment based on a variety of site characteristics. Please note that the following should also be used when determining surfacing materials for stairs or overlooks.

As new and/or improved surfacing options become available, they should be evaluated in the same manner described in Table 4E. Consult the district's sustainability policy prior to making decisions about surfacing materials.

		Trail Conditions (3 = Better Suited / 1 = Lesser Suited)								
BRII	LE 4E DGE / BOARDWALK RFACING MATRIX	Shaded Conditions	Sun Conditions	Vehicle Access	Active Use (jog/ bike)	ADA	Cost	Ease of Maintenance	Wetlands/ Water	Durability/ Sustainability
<u> 5</u>	lpe	1	3	TBD	1	3	1	3	3	3
	Treated Wood	2	2	2	2	3	3	2	1	2
Trail Surfacing	American Plastic Lumber	2	2	1	3	3	2	2	3	2
ail Su	Fiberglass Grating	3	2	1	2	2	1	3	3	2
Ĕ	Metal Grating	3	3	1	2	2	1	3	3	2
	Concrete Slab	TBD								

4.9 MID-BLOCK CROSSINGS

The following provides design guidance for roadway intersection treatments. The guidelines presented in this plan represent conceptual recommendations. Specific roadway intersection treatments will be based on further engineering analysis conducted by a registered engineer and review by the respective jurisdictional agency (City of Beaverton or Washington County).

The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, trail traffic, use patterns, vehicle speed, road type, road width and other safety issues such as proximity to major attractions. When space is available, use of a median refuge island can improve user safety by providing pedestrians and bicyclists the space to perform a safe crossing.

Regardless of whether a mid-block crossing is non-signalized or signalized, the crossing should do the following:

- » Be a safe distance (based on travel speeds and sight lines) from adjacent intersections and not interfere (or be interfered) with vehicle traffic flow
- » Be located on flat topography to increase motorist visibility of the trail crossing
- » Be as close to perpendicular (90 degrees) to the roadway as possible
- » Use signage and striping to warn trail users of the upcoming roadway is strongly recommended
- » Maintain clear sight lines between trail users and motorists by clearing or trimming vegetation obstructions
- » Provide a center median refuge if the crossing is more than 75 feet from curb to curb or as directed by the agency with jurisdiction

When a proposed trail mid-block crossing is within approximately 300 feet of an existing signalized pedestrian crosswalk, the trail should be routed to it. This will avoid potential traffic signal operation problems and reduce motorist confusion. For this alignment to be effective, barriers, signage or offset trail alignments may be needed to direct trail users to the signalized crossing. If no pedestrian crossing exists at the signal, modifications may be required to accommodate a safe crossing.

4.9.1 Non-Signalized Crossings

Non-signalized crossings are most likely to occur at local/ neighborhood roadways and some collector roadways. Nonsignalized crossings may be appropriate when maximum traffic volumes are less than 9,000-12,000 ADT (average daily traffic) vehicles and maximum travel speed is 35 MPH (miles per hour). Nonsignalized crossings may be appropriate with traffic volumes up to 15,000 ADT on two-lane roads and up to 12,000 ADT on four-lane roads, if a median refuge island is provided in both scenarios.



 $\begin{tabular}{ll} FIGURE~4H \\ \it Mid-block~non-signalized~trail~crossing~of~a~local/residential~street. \\ \end{tabular}$

Typical treatments at these crossings include:

- » Continental striping, if allowed by the agency with road jurisdiction
- » Signage
- » Sidewalk improvements, such as ADA transitional ramps
- » Vehicle bollards at trail access points
- » Street lighting
- » Median refuge islands if appropriate
- » Speed hump or raised crosswalk on roadways with low to moderate traffic volumes (under 12,000 ADT) and a need to control traffic speeds

Trail design features that may be used to warn trail users of an upcoming roadway crossing may include the following:

- » Curves in the trail to help slow trail users and raise awareness of oncoming vehicles
- » Detectable warning strips help visually impaired pedestrians identify the edge of the street
- » Signage

4.9.2 Signalized Intersections

Signalized crossings are most likely to occur at arterial roadways and some collector roadways. There are different scales of signalization, depending on traffic capacity, speed and trail user volume.

A signalized intersection should include all of the same treatments as a non-signalized crossing, plus the addition of a traffic control device. The addition of a traffic control device, such as a traffic signal or flashing beacon, provides increased protection for trail users.

Typical traffic control devices used by the district, as approved by the City of Beaverton or Washington County, include the following:

» Rectangular Rapid Flashing Beacons (RRFB) act as lit warning devices to supplement the trail crossing warning signs at uncontrolled approaches.











- » Pedestrian Activated Hybrid Beacons (also known as HAWK signals) alert motorists to stop when trail users are crossing mid-block. When not activated, the signal is dark. When activated, the overhead signal begins flashing yellow, followed by solid yellow, advising motorists to prepare to stop. The signal then displays two solid reds allowing bicyclists and pedestrians to safely cross. Finally, an alternating flashing red signal indicates that motorists may proceed when safe, after coming to a full stop.
- » Full Traffic Signal is a typical traffic signal with a green light always shown. When activated by a bicyclist or pedestrian, the light changes to yellow, then red; allowing the user to safely cross with a "Walk" indicator. Full traffic signal installations must meet MUTCD pedestrian standards for schools or modified warrants, which include: being located where a shared use path intersects with a high volume, high speed roadway, with traffic volumes exceeding 15,000 ADT and vehicle speeds exceeding 40 MPH.

Unlike non-signalized crossings of local or residential street, each signalized crossing (regardless of traffic speed or volume) requires additional review by a registered engineer and the agency having jurisdiction of the roadway to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity and safety.

4.9.3 Grade-Separated Crossings

Grade-separated crossings may be appropriate where a path intersects with a high volume, high speed roadway, with traffic volumes exceeding 25,000 ADT and vehicle speeds exceeding 45 MPH. Due to considerable cost and complexity of design, grade separated crossings are limited to unique situations and usually in partnership with a local jurisdiction. Typical grade-separated crossings include:

- » Undercrossing
- » Overcrossing

Safety and ADA accessibility is a foremost concern with both types of crossings. In undercrossing situations, the trail user may be temporarily out of sight from public view or experience and environment with poor visibility. To ensure safety and security concerns are met, both types of crossings must be spacious, well-lit and visible to public view. Flooding and/or standing water may also pose a problem for undercrossings requiring the need for periodic cleaning and/or draining (especially after storm events for those undercrossings that may be located within greenways).

4.10 RISK, SAFETY AND SECURITY

4.10.1 Crime Prevention Through Environmental Design (CPTED)

Along with the desire of creating well-designed trails for its residents, the district is also intent on ensuring the safety and security of its trails and facilities. To help make this possible, the following fundamental CPTED principles should be considered.

» Access

- Establishment of clearly defined trail entries and facilities for trail users to easily access and move about
- Establishment of clearly defined trail boundaries to differentiate between public and private spaces

» Visibility

 Maintain open sight lines throughout a trail corridor in order to promote natural surveillance and the "see and be seen" concept

4.10.2 Scan Analyze Response Assess (SARA)

SARA is a four-step process to quickly address situations that occur in the field, and is described as follows:

- » Scan: observe what the situation is, to determine what possible factors are the cause
- » Analyze: determine what possible solutions could be implemented to correct
- » Response: implement solution
- » Assess: evaluate if the solution corrected the situation or if additional measures need to be taken

4.10.3 Sight Distance

Maintaining adequate sight distance for trail users is key in providing a safe trail system. This includes ensuring visibility for (and of) trail users at mid-block crossing locations, steep slopes and switchbacks, tight curves, wooded areas and any other situation where sight lines could be impaired due to site conditions.

4.11 MAINTENANCE & OPERATIONS

Maintenance operations of district trails fall into one of two categories: park maintenance or natural resources maintenance.

- » Park maintenance is responsible for hard surface trails in order to provide safe and open access opportunities for people to recreate, travel, play and enjoy the outdoors
- » Natural resources maintenance is responsible for soft surface trails in order to lessen human impacts and allow natural processes to continue, while providing safe passage for people where appropriate

Please refer to the district's PFP for additional information relating to park maintenance and the NRFP for additional information relating to natural resources maintenance. Trail maintenance operations fall into both categories and consist of the following:

4.11.1 Trail Management Program

THPRD's Natural Resources & Trails Management department administers the district's approved Trails Management Program. The goal of the Trails Management Program is to provide high quality trail systems that safely and sustainably connect people and communities. When the program is successful, these conditions will be met:

- » Trails will meet safety standards
- » Trail stakeholders, such as district departments and volunteers, will know their role
- » Trail information will be available to the public

Trails management is a team effort, requiring the cooperation of multiple departments. The Natural Resources & Trail Management department has the lead role to coordinate the strengths of trained volunteers and the Maintenance Operations, Design & Development, Risk Management, and Security Operations departments to recognize and recommend physical and service improvements to our district's trail system. Please refer the program document for more detailed information about trails management.

4.11.2 Safety Inspection Training Program

As part of the Trails Management Program, the district uses a Safety Inspection Training Program. This program trains district staff to be aware and able to identify potential hazards along the trail system, such as overhanging tree limbs, deteriorating trail surfaces or substandard trail sections. These inspections are conducted annually and are prioritized accordingly. Those hazards posing immediate safety concerns to trail users are moved to the top of the list and addressed immediately. All other potential hazards are rated using a risk assessment matrix for future inclusion in the district's capital maintenance replacement program. The Trails Analysis Form is included in the Appendix for reference.

4.11.3 Maintenance Standards Manual

In addition to the district's Trails Management Program, additional standards and guidelines for trail maintenance can be found in THPRD's Maintenance Standards Manual. Please refer to this manual for district standards and guidelines related to trail maintenance practices. This manual is intended to work in tandem with the Trails Management Program and helps implement many of trail management principles.

4.11.4 Maintenance Vehicle Access Guidelines

In general, regional and community trails should be designed with maintenance and emergency vehicle access in mind. This includes not only the paved trail, but also any bridges or boardwalks along a trail corridor. However, not all bridges and boardwalks need to be vehicle rated if adequate access can be provided from either end of a bridge or boardwalk. Additional guidance can be found in Section 4.8 above.

1	IN THE BOARD OF COMMISSIONERS					
2	FOR WASHINGTON COUNTY, OREGON					
3	In the Matter of the Board of) RESOLUTION AND ORDER Commissioners' Acknowledgement of)					
4	Washington County's Tualatin Valley) Trail Concept Plan)					
5) No. 21-114					
6						
7	This matter having come before the Washington County Board of Commissioners at its					
8	meeting of August 3, 2021; and					
9	It appearing to the Board that the Transportation and Growth Management (TGM) Program, a					
10	joint program of the Oregon Department of Transportation and the Oregon Department of Land					
11	Conservation and Development, funded Washington County's Tualatin Valley Trail Concept Plan					
12	(Concept Plan); and					
13	It appearing to the Board that the Concept Plan aligns with the Washington County					
14	Transportation System Plan (TSP) strategy to work with partners to plan, map and improve					
15	countywide trail connectivity, including filling gaps in existing regional trails and planning new trails					
16	in areas lacking in these facilities; and					
17	It appearing to the Board that the Tualatin Valley Trail is designated as a Regional Trail					
18	Refinement Area in the TSP, which is an area where a Regional Trail is planned conceptually but the					
19	specific alignment has not yet been determined; and					
20	It appearing to the Board that the Aloha-Reedville Community Plan, TV Highway Corridor					
21	Plan, and the Aloha Tomorrow project included near-term recommendations to determine the					
22	feasibility of building the Tualatin Valley Trail in the TV Highway corridor; and					
23	It appearing to the Board that coordination with local, regional, and state partners such as					

City of Beaverton, City of Hillsboro, Tualatin Hills Park & Recreation District, Metro, and the Oregon

24

1	Department of Transportation as well as private property owners, was necessary to study the					
2	feasibility of the Tualatin Valley Trail; and					
3	It appearing to the Board that the Concept Plan provides baseline documentation and					
4	advances the understanding to designate a preferred alignment for the Regional Trail in Aloha					
5	between 160th and 209th avenues; and					
6	It appearing to the Board that the Concept Plan will serve to inform a forthcoming ordinance					
7	to amend the TSP as well as future funding, planning and project development; it is therefore,					
8	RESOLVED AND ORDERED that the atta	ached Concept Plan in "Exhibit A" is hereby				
10	acknowledged.					
11	DATED this 3rd day of August 2021.					
12		BOARD OF COMMISSIONERS FOR WASHINGTON COUNTY, OREGON				
13		Lab III				
14 15		CHAIR KATHRYN HARRINGTØN X LIWN MON				
		RECORDING SECRETARY				
16 17	For Washington County, Oregon					
18	3					
19						
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