

# Hood River Westside Area Concept Plan

## Technical Advisory Committee



**Date:** April 26, 2017  
**Time:** 2:00 to 5:00 PM  
*Please note the 2 PM start time.*

Hood River City Hall  
211 Second Street  
Hood River  
Council Chambers

## Agenda

*Note: Attached is a partial draft of the Preferred Concept Plan Report, which includes several appendices. To prepare for the meeting, it is suggested that Committee members: (1) skim the entire packet; (2) review Appendix B in detail (it is first up in the agenda); and (3) review the remainder of the report, starting from the beginning.*

2:00 p.m.      **Welcome**

- Welcome and self-introductions
- Agenda overview and where we are in the process

Joe Dills, Angelo  
Planning Group

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2:10 p.m.      **Draft Preferred Concept Plan – Land Use, North-South Connector, and Neighborhood Commercial**

*This agenda item will address the three topics for which broad alternatives have been evaluated: Land Use, North-South Connector (aka Mt Adams Extension), and Neighborhood Commercial. Please see Appendix B of the attached report.*

- Presentation, discussion, and Committee input into the recommendations
- Identify potential refinements
- Consensus check-in's: straw polls of support for the refined recommendations

Project Team

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3:15 p.m.      **Draft Preferred Concept Plan – Remainder of Recommendations**

*Note: a short break will occur at about 3:30 PM*

*In this agenda item, the Committee will work through the remainder of the recommendations, starting with the report's Introduction, and going through the remainder of the report. Please see attached Preferred Concept Plan report.*

- Presentation, discussion, and Committee input on the memorandum
- Identify potential refinements
- Consensus check-in's: straw polls of support for the recommendations (as potentially refined)

Project Team

For additional information, visit the project website at [www.hrwestsideplan.com](http://www.hrwestsideplan.com) or contact Kevin Liburdy, City of Hood River, via [Kevin@hrwestsideplan.com](mailto:Kevin@hrwestsideplan.com) or 541.387.5224. All public meeting locations are handicapped-accessible. Please let the City Recorder know if you will need any special accommodations to attend the meeting. Call (541) 387-5217 for more information. OREGON RELAY SERVICE 1-800-735-2900.

4:10 p.m.

**Implementation – Housing Implementation and Potential Code Updates**

*This agenda item will be a first discussion of housing implementation and potential code updates. The team is looking for Committee input into these topics to help guide the preparation of policy and code updates following the meeting.*

- Discussion of housing implementation (see attached Appendix F of the report)
- Discussion of potential code updates (see Implementation section of the report)

Joe Dills, Angelo  
Planning Group

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5:00 p.m.

**Next Steps and Adjourn**

# Memorandum



2/23/2017

**To:** Technical Advisory Committee  
**Cc:** Project Management Team  
**From:** Joe Dills and Andrew Parish, Angelo Planning Group  
**Re:** **DRAFT** Summary of February 22, 2017 TAC Meeting

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## INTRODUCTION

This memorandum provides a summary of the February 22, 2017 meeting of the Hood River Westside Area Concept Plan Technical Advisory Committee (TAC), including meeting discussion, decisions made and next steps.

## SUMMARY OF DISCUSSION

**Date:** February 22, 2017  
**Time:** 3pm  
**Location:** Hood River City Hall,  
301 Oak St, Hood River, OR 97031

### Members:

- Kevin Liburdy, City Planning Dept. (PMT)
- John Roberts, Director, Hood River County Community Development Dept. (PMT)
- Gail Curtis, Oregon Department of Transportation, Transportation and Growth Management Program (PMT)
- Joel Madsen, Executive Director, Mid-Columbia Housing Authority
- Saundra Buchanan, Hood River County School District (ABSENT)
- Don Benefield (Operations Director), Hood River County School District
- Marcie Wily, in for Mark Hickok, Hood River Calley Parks District
- Ron Nails, Columbia Area Transit (ABSENT)
- Mark Lago, Director, City Public Works and Engineering Dept. (ABSENT)
- Cindy Walbridge, Director, City Planning Dept.
- Jennifer Kaden, City Planning Dept.
- Kip Miller, Volunteer Coordinator, City Fire Dept (ABSENT)
- Neal Holste, Chief, City Police Dept (ABSENT)
- Steve Wheeler, City Manager
- Kim Travis, Oregon Dept of Housing and Community Services (ABSENT)
- Scott EEdelman, DLCD (ABSENT)

### Agenda Item 1: Welcome

Welcome from Kevin Liburdy and Joe Dills, followed by a round of introductions.

This meeting is a bridge meeting between work done in the Fall that gave us alternatives, and the narrowing to a preferred alternative. The committee is not making decisions tonight – but if we can get comments/preferences on the materials in the packet that will be very helpful.

## Agenda Item 2: Concept Plan Alternatives

### Framework Plans

Ken Pirie discussed Framework Plans in the alternatives report.

- **Neighborhood Framework.** Organizing concept of neighborhoods and districts, discussed in earlier meetings.
- **Major Streets.**
  - With regard to alternative A – it looks like the County-owned parcel may be impacted. Desire for that site to remain suitable for affordable housing.
  - Cost is a concern – which of these options is the most expensive? That is not known at this point, though the team can determine the linear feet of new construction for each alternative.
- **Minor Streets.** Ken discussed an additional layer of connectivity provided by minor streets shown in this diagram. An even finer-grained level of street network would be provided by private development.
- **Parks Framework.**
  - Parks should be examined city-wide, not in isolation.
  - Parking, lighting, traffic for a community park is problematic outside the UGB. Parks district has deprioritized the location just outside of the study area.
  - Everything on this parks map is millions of dollars away. Think small for parks!
  - Parks district would prefer two or three 5-10 acre parks, instead of lots of small parks.
  - Parks were stressed in the survey results, and it is important to plan them now prior to development.
  - Concern about the community park – if it doesn't work out outside the UGB it would be difficult to locate within the study area, and it would take up lots of residential land.
  - Lots of people ant parks, but they don't want tax or parking fee increases.
  - Do comprehensive plan polices require annexation to include open space designation?
  - In a couple of years we may have a better idea of whether/how the UGB could be expanded.
- **Commercial Framework.**
- **Bicycle/Pedestrian Framework.** Ken introduced the bicycle and pedestrian framework maps to provide active transportation connections throughout the area.
  - Regarding the Historic Columbia River path – the desire will be to stay North of the freeway rather than use Cascade.
  - There is a PUD called “The Village at Rand Hill” that currently shows a pedestrian trail. The City has not discussed this option with the homeowners there yet.
  - There will be discussion of a roundabout at Mt. Adams and Cascade by City Council soon.

### Land Use Alternatives

Andrew Parish presented the land use analysis in the Alternatives Report. He explained the expected capacity of the area under current zoning (base case), the moderate scenario, and the strong scenario, as well as the

assumptions that went into each scenario. The analysis is based largely on the amount and location of this expected capacity, and makes up the bulk of the report.

Joe asked for a straw poll with general comments about why members had specific preferences.

- Moderate – 4 votes
  - Concern about 3,000 sf lots being too small
  - There are 400k houses on 3000 sf lots. Smaller lots don't mean affordable
  - This breakdown comes closest to what HNA said is needed.
  - This option may be politically more feasible.
- Strong – 4 votes
  - The city need smore zoned R3.
  - Might not achieve the high level of mf units in that zone that the HNA or these assumptions expect – better to aim high.
  - Critical issue is lack of apartment housing. Even market rate apartments.

### Transportation Alternatives

Joe returned the conversation to major transportation connections and asked a similar question of preference.

- 8 were leaning toward Option B. None leaning toward Option C.
- Two parallel routes provide better connectivity – D could also be built.
- Andy von Flotow is already partitioning parcels to allow for A and D.
- Desire for more information – the team will package modeling impacts, development implications, impacts on east-west connections, and linear feet of new roadway for TAC discussion.

Process check – zoning memo to follow and

Last comment – desire to have explicit work during the Preferred Alternative to implement affordable housing objectives. The team will discuss and follow up.

### Agenda Item 3: Infrastructure Funding Toolkit Memorandum

This item was not addressed at the meeting. Instead, the committee agreed written comments would suffice.

### Agenda Item 4: Policy and Code Issues

This item was not addressed at the meeting. Instead, the committee agreed that a written summary of policy code issues with written discussion would suffice.

## NEXT STEPS

Upcoming open house - Westside Elementary, Thursday March 9th, 6:30 to 8:30.

Joint PC and CC briefing, March 13.

Back to this group: April 26.



**Preferred Concept Plan Report**

**April 19, 2017**

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# INTRODUCTION

## Purpose

The purposes of the Hood River Westside Area Concept Plan (Concept Plan) are to:

- Establish the overall vision for the Westside Area;
- Illustrate and define an integrated land use and transportation plan for the area, addressing land use, streets, bike ways, pedestrian paths, parks, open space, schools, and utilities;
- Support and facilitate the development of workforce and affordable housing;
- Serve as a guide for coordinating individual developments and public realm improvements into a cohesive community that is an extension of Hood River; and
- Provide implementation strategies for land use regulations and infrastructure funding.

## Scope of this Report

This report is an interim step in preparing the Concept Plan. It describes the elements of the Concept Plan listed below, and includes draft recommendations for discussion by participants in the process.<sup>1</sup> Draft recommendations are included for the following topics:

- Neighborhoods and Districts
- Land Use
- Transportation (Streets, Transit, Pedestrian and Bicycle Connections)
- Park and Open Space
- The Gateway Area
- Implementation

Two additional parts of the Concept Plan are contingent on first setting the direction for land use and transportation, and therefore are not included in this report. They will be prepared after the land use and transportation frameworks are reviewed by the project committees. Those two elements are:

- Water, Sanitary Sewer, and Storm Water Plans (planning level layouts and cost estimates)
- Infrastructure Funding Plan

Appendix B is a memorandum titled “Selecting the Preferred Alternative.” It describes the analysis and rationale for three key elements of the Concept Plan: the land use plan, the north-south connector road (also known as the Mt. Adams Avenue extension), and the neighborhood commercial sites. Each of these issues had several distinct alternatives brought forward in the previously published Alternatives Report.<sup>2</sup> They were discussed by the project committees at their meetings held on February 22, 2017 and were presented at the Open House held on March 9, 2017. Questions regarding the three issues were also included in the online survey that followed the Open House.

Appendix C provides a detailed Transportation Impact Analysis for the Concept Plan. It uses the “Strong Alternative” for land use to evaluate impacts to Hood River’s transportation system in order to test the highest level of potential vehicle trip generation as a result of the alternatives.

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<sup>1</sup> Appendix A is a placeholder for the membership of the Technical Advisory Committee (TAC) and Project Advisory Committee (PAC), which will be produced for the final version of the report.

<sup>2</sup> The Alternatives Analysis Report was published on February 8, 2017 and can be accessed on the project website at: [https://www.hrwestsideplan.com/s/Hood-River-Alternatives-Report\\_Revised\\_v2.pdf](https://www.hrwestsideplan.com/s/Hood-River-Alternatives-Report_Revised_v2.pdf)



Appendix D includes an evaluation of a roundabout option for the intersection of Cascade Avenue and Mt. Adams Avenue.

Appendix E is a summary of the online survey conducted for the alternatives.

Appendix F is the 2010 Exit 62 Concept Plan. These drawings provide background and context for the Gateway drawings included in this report.

*A note on format: This report provides concise narratives and the core maps for each part of the plan prepared to date. The final Concept Plan report will include all elements of the plan, contextual descriptions, a summary of the planning process, and additional images and graphics. It will also have an enhanced layout and format.*

## Regulatory Role of the Concept Plan

The Concept Plan establishes the basis for implementing Comprehensive Plan policies and zoning code standards. The City's intent is to adopt the Concept Plan as a supporting document of the Comprehensive Plan. The specific approach and format for the regulations are currently under evaluation, however, the basic parts of the regulations will include:

- Comprehensive plan policies;
- Updates to the Comprehensive Plan/Zoning map;
- Updates to the City's Transportation System Plan;
- Updates to the City's Public Facilities Plans for sewer, water, and, as needed, storm water; and
- Updates to zoning code standards.

Regarding the code, the City is also discussing code updates that may apply citywide to address housing affordability and livability issues as addressed in the City's 2015 Housing Strategy. The code work prepared for the Concept Plan can inform the citywide work, and vice versa. Following the completion of the Concept Plan, the City will finalize the code updates, bringing the Westside Area and citywide efforts together into a cohesive package.

## Vision and Guiding Principles

The following vision statement and guiding principles were derived from the Project Advisory Committee and Technical Advisory Committee discussions held on October 5, 2016.

### Vision

The vision statement approved by the Project Advisory Committee is:

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*The Westside Area will grow to become an interconnected community of great neighborhoods, an attractive gateway of commercial and mixed-use activity, and an affordable and diverse area of the City.*

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The Westside's hallmarks will be:

- Housing options that provide choices for all income levels, life stages, and cultures within Hood River.
- Streets, trails, and paths that are walkable, connected, and green.
- Neighborhood design that celebrates the landforms, views, and magnificent landscape of Hood River.
- Open spaces and parks that support community gathering and a connection to nature.

The Westside Area will be an integral part and extension of the larger Hood River community.

## Guiding Principles

The following guiding principles are intended to implement the vision statement and provide clear touchstones to evaluate elements of the Concept Plan.

The Hood River Westside Area Concept Plan will:

- A. Create livable neighborhoods that make good use of the Westside's limited land supply.
- B. Create well-planned and commercially successfully mixed-use districts in the Westside gateway area.
- C. Create a plan that works for all ages and abilities of the community.
- D. Provide a range of densities and housing types by retaining existing affordable housing and increasing affordable housing choices in Hood River.
- E. Incorporate natural features and a sense of place into each neighborhood and district.
- F. Include open space and parks integrated in neighborhoods.
- G. Provide a connected transportation network with walkable, bike-friendly, and green streets.
- H. Promote active and healthy living through community design.
- I. Plan land uses and transportation facilities so the area may be served by fixed route transit in the future.
- J. Integrate Westside Elementary School and future new schools as key community places.
- K. Promote human-scaled building designs.
- L. Plan for efficient water, sewer, and stormwater infrastructure, utilizing green practices for stormwater management.
- M. Provide a realistic infrastructure funding strategy.

The planning process will:

- N. Be open and transparent.
- O. Embrace cultural and community diversity throughout the plan and planning process.

## Overview of Hood River's Westside Area

The project area is located on the west side of Hood River and extends south from Interstate 84 at Exit 62 into a historically low-density residential area that includes numerous vacant parcels. In summary:

- The Westside Area contains approximately 447 acres and consists of approximately 577 lots/parcels, including developed neighborhoods, vacant, and partially vacant lands.
- Approximately one half of the Westside Area is vacant or partially vacant and located in Low Density Residential or Standard Density Residential zones.
- The Westside Area includes a total of approximately 60 developable acres zoned General Commercial and Light Industrial, located in the "Gateway" area along Cascade Avenue.
- The Westside Area includes a 17-acre vacant parcel owned by the Hood River County School District that is being considered for future facility needs.
- The westernmost 158 acres of the Westside Area is located outside the city limits but within the Urban Growth Boundary (see Figure 1 and Figure 2 below). An intergovernmental agreement between the City and the County addresses the County's management of land use activities in this Urban Growth Area ("UGA") consistent with City standards until such time that annexation occurs.

The Westside Area, and all of Hood River, enjoy one of the most beautiful landscapes of the Pacific Northwest. Positioned at the crossroads of the spectacular Columbia River Gorge and the magnificent Cascade Range, the City

and the Westside Area are framed by the Gorge, the east and west hills of the Hood River Valley, Mt. Hood, and Mt. Adams. Throughout the project area, there are views of Mt. Hood, Mt. Adams, and the Columbia River. Proximity to these natural wonders fosters a strong connection by residents and visitors to the land, weather, recreational amenities, rural character, and small-community lifestyle of Hood River.

The Westside Area is well-connected to the rest of the city by key existing and planned east-west connector roads: Cascade Avenue, Sherman Avenue, May Street, and Belmont Drive. The north-south connector roads, which are less continuous but still provide a framework for good connectivity, include Rand Road, 30<sup>th</sup> Street, the planned Mt. Adams Avenue extension, and Frankton Road at the western edge of the Project Area. This framework of connections to and through the Westside Area is very important for circulation and supporting active transportation choices such as walking and biking. It is also important for designing new neighborhoods in the Westside that are a connected and integral part of Hood River as a whole.

Figure 1. Citywide Context

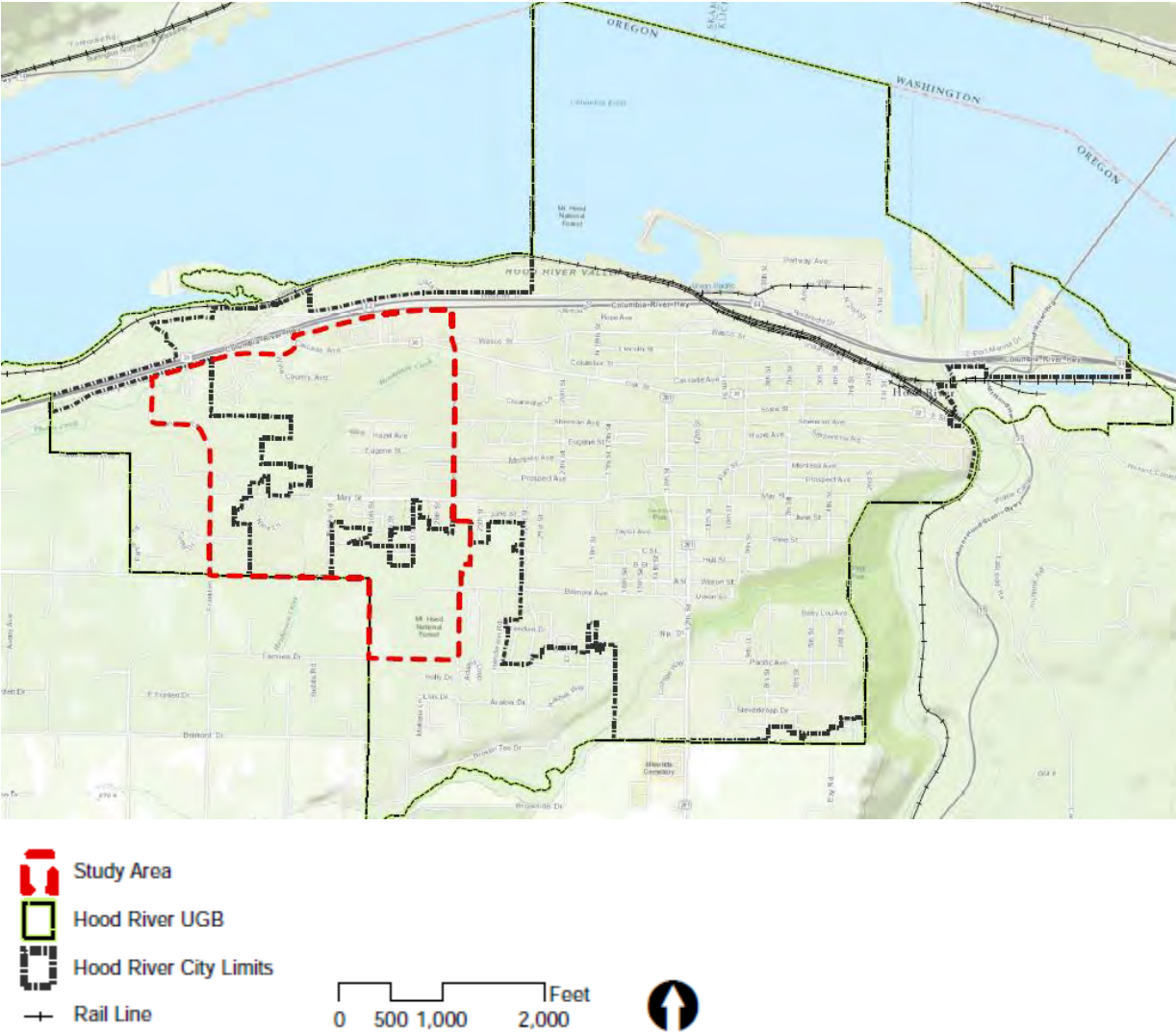
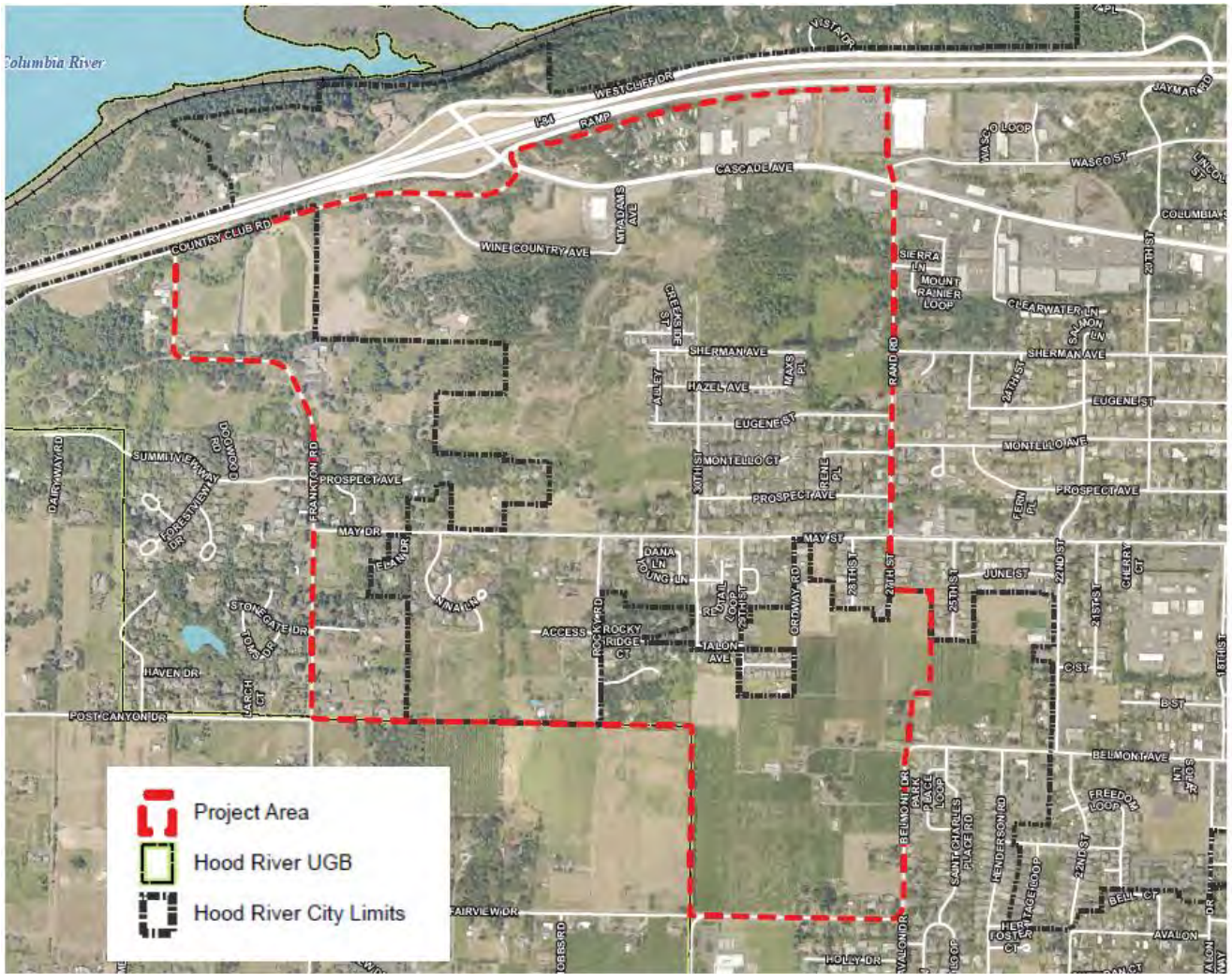




Figure 2. Project Area



## FRAMEWORK PLANS

The Concept Plan is comprised of Framework Plans, which depict the plan's "layers." The term Framework Plan is intended to convey the conceptual and long-term guiding role of each layer. More detailed and site-specific implementation is assumed for each of the Framework Plans. The Framework Plans for the Westside Area Concept Plan are:

- Neighborhoods and Districts Framework
- Land Use Framework
- Streets Framework
- Pedestrian and Bicycle Connections Framework
- Parks and Open Space Framework
- Gateway Area Framework
- Water, Sanitary Sewer, and Storm Water Framework (not included in this report)

### Neighborhoods and Districts Framework

The project area is characterized by three terraces sloping north toward the Columbia River. This condition allows for stunning views and the opportunity to define neighborhoods and districts based on local topography, natural features, and walkable areas within each topographic subarea. The terraced landscape also presents challenges for transportation connections, development in rocky and steep areas, and utilities.

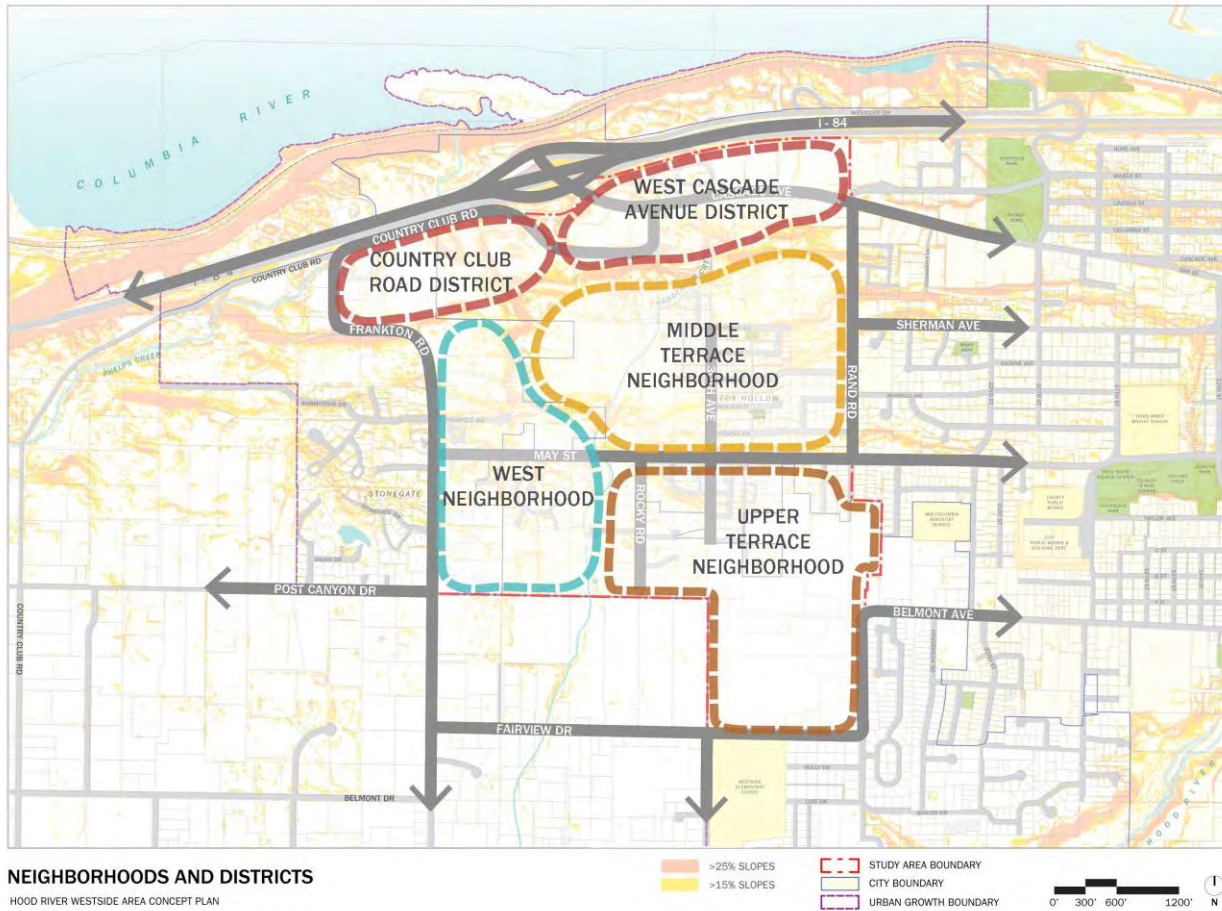
The Neighborhoods and Districts Framework Plan utilizes the terraces of the project area to organize the physical aspects of the Concept Plan (see Figure 3). The districts and neighborhoods are:

- **West Cascade Avenue District.** This district is the commercial, residential, and mixed use area in the lower terrace along west Cascade Avenue. It is the gateway into Hood River from the west and Exit 62.
- **Country Club Road District.** This district includes the lands along Wine Country Avenue and Country Club Road that comprise the area's supply of largely undeveloped commercial and industrial lands.
- **Middle Terrace Neighborhood.** Located generally north of May Street, this neighborhood extends from roughly 370 feet to 490 feet in elevation and contains existing subdivisions as well as a significant amount of undeveloped land west of 30<sup>th</sup> Street.
- **Upper Terrace Neighborhood.** Located generally south of May Street and ranging from 500 to 580 feet in elevation, this neighborhood has several existing subdivisions, but is primarily composed of larger undeveloped parcels and commercial orchards. It is anchored on the south by Westside Elementary School.
- **West Neighborhood.** This neighborhood comprises the westernmost portion of the project area to Frankton Road.

The edges of these areas are conceptual and should be thought of as transition areas rather than hard-and-fast boundaries. The organization of land use and transportation within the natural topography of the Westside Area is an important "big move" to connect the livability of the neighborhoods to the powerful landscape of Hood River, and plan for walkable neighborhoods and districts.



Figure 3. Neighborhoods and Districts Framework



## Land Use Framework

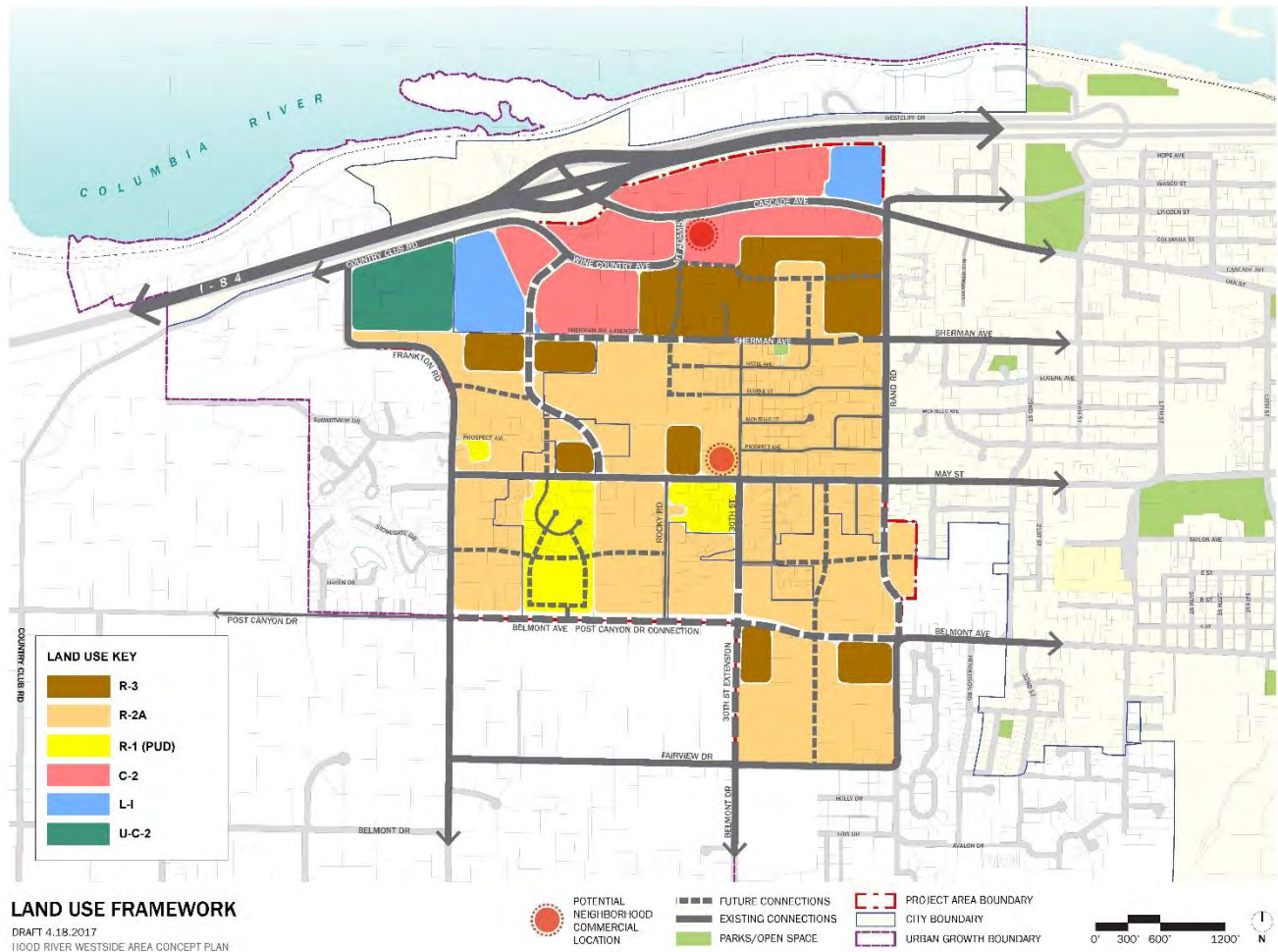
The Land Use Framework displays the planned land uses for the Westside Area (see Figure 4). It uses the nomenclature of Hood River’s Comprehensive Plan designations, which are:

- R-3 Urban High Density Residential
- R-2A Urban Standard Density Residential (modified)<sup>3</sup>
- R-1 PUD Urban Low Density Residential (with approved Planned Unit Developments)
- C-2 General Commercial
- L-1 Light Industrial
- U-C-2 General Commercial (a Hood River County designation)

The Land Use Framework also includes two sites for locally-serving neighborhood commercial services, as discussed below. They are labeled Potential Neighborhood Commercial Location in Figure 4 below. For context, existing and future streets (from the Streets Framework) are also shown.

<sup>3</sup> The R-2A would vary from the base R-2 by modifying the minimum lot size to be 4,000 square feet rather than 5,000 square feet. This potential change is referenced in the Hood River Housing Strategy Report.

Figure 4. Land Use Framework



## Housing

Supporting and facilitating affordable housing is an important purpose of the Westside Area Concept Plan. To that end, the Land Use Framework implements the following key concepts for housing:

- **Increasing the amount of “missing middle” and higher density housing.** Opportunities for small lot, duplex, townhome, and apartment housing are created by changing lands currently zoned R-1 (Low Density) to R-2A (Standard Density with a 4,000 square foot minimum lot size) or R-3 (High Density).
- **Increasing the mix of housing in the Middle Terrace, Upper Terrace, and West Neighborhoods.** To promote a mix of housing in each neighborhood, each of the zones noted above are designated in each neighborhood.
- **Distributing R-3 lands in small amounts in multiple places.** Re-designation of lands currently zoned R-1 or R-2 to R-3 is one of the fundamental ways to increase affordable housing choices and mix. The Land Use Framework uses the strategy of distributing R-3 lands in each neighborhood to: (a) avoid high concentrations of apartments in any one location; (b) increase the mix of housing in each neighborhood; and (c) align with the smaller site sizes that are likely to be desirable apartment projects in Hood River. Discussions with City staff indicate that apartments in Hood River have historically been constructed on sites of 4-6 acres, as opposed to 10-20+ acres as is more common in Oregon’s larger cities.



- **Consideration of the proximity of land uses to services, schools, future parks, and other amenities.** The land uses have been planned in coordination with the various other framework plans. As an example, the R-3 sites are all close to major roads, transit, parks, and/or services.

#### Housing Metrics

In order to evaluate the expected development of the Preferred Alternative, the following assumptions are utilized:

- **Buildable Lands Inventory.** The analysis is based on a buildable lands inventory conducted for the citywide 2015 Housing Needs Analysis (HNA). This inventory took into account natural resource constraints such as steep slopes, existing development, and large parcels with existing homes that may have capacity for additional units in the future. The inventory has been updated to include a 25-foot riparian buffer setback area around Henderson Creek, which runs through the study area.
- **Housing Needs Analysis.** The HNA was the basis for the projected development densities and housing mix within the various zones of Hood River. The ultimate density and mix of development will depend on a variety of market factors and policy choices.
- **Existing Homes.** Based on tax lot data and aerial photography, there are an estimated 535 existing homes in the study area. These are assumed to remain, though large lots with the ability to add additional homes are assumed to do so.
- **Parks.** The Preferred Alternative assumes one three- to five-acre neighborhood-scale park in each of the three neighborhoods. An additional independent question is whether to include a larger community-scale park in the Westside Area, which is discussed in greater detail in the Parks and Open Space Framework.
- **School Property.** The Hood River County School District owns a 17-acre property in the Westside Area. This property is planned for one or more future schools, and has a central role in the design of the Westside Area in all scenarios.
- **County Property for Affordable Housing.** The County's two-acre parcel at 30<sup>th</sup> Street and Sherman Avenue is assumed to be used for an affordable housing project.
- **Industrial and Commercial Land.** No changes to the zoning designations for industrial and commercial land are assumed. However, changes to residential capacity may result in recommendations for streetscape design or increase the need for locally-serving businesses.
- **Changes to Achieve the Concept Plan.** The Preferred Alternative changes all undeveloped R-1 land (outside of an existing Planned Unit Development (PUD)) to R-2A, which has a minimum lot size of 4,000 square feet. Additionally, 30.5 acres will be converted to R-3 throughout the Westside Area in order to provide additional land for multifamily housing.

Table 1 below is an estimate of development capacity for the Preferred Scenario. This is a "base" estimate, which could be increased if bonuses are permitted for workforce and affordable housing.

Table 1. Development Capacity of the Preferred Scenario

	R-2A	R-3	R-1 (PUDs)
<b>Assumed Density</b>	8.4	20.3	-
<b>Developable Acreage</b>	133.25	39.32	-
<b>Net Acres (subtracting assumed parks from R-2A)</b>	119.25	39.32	-
<b>New Dwelling Units</b>	1,002	798	31
<b>Total New Units</b>	1,831		
<b>New Units + Existing</b>	2,366		

Table 2 below provides an estimate of the housing mix for the Preferred Scenario. These figures are extrapolated from data in Table 5 of the HNA.<sup>4</sup>

- R-1 PUDs are assumed to develop as single-family detached housing.
- R-2A land is assumed to develop as a mix of single-family detached (including cottage cluster development), single-family attached (such as townhomes), and multifamily (duplexes/triplexes) housing.
- R-3 land is assumed to develop primarily as a mix of single-family attached (such as townhomes), and multifamily (apartments or condominiums).<sup>5</sup>

Table 2. Estimated Mix of New Housing Units

	R-1	R-2A	R-3	Total	
<b>SFD</b>	31	531	8	570	31%
<b>SFA</b>	0	271	160	431	24%
<b>MF</b>	0	200	630	830	45%
<b>Total</b>	31	1002	798	1831	100%

### Commercial, Industrial, and Mixed Use

The Land Use Framework retains the existing land use designations within the West Cascade Avenue and Country Club Road Districts. These lands are important to fulfilling the city’s need for commercial and industrial land as documented in the City’s Economic Opportunities Analysis. Mixed-use and additional housing in the West Cascade Avenue District is a desired goal, but not a mandate. Hood River’s zoning already allows housing within commercial areas like the West Cascade District. Even with a strong housing market and high land values, the feasibility of vertical mixed use development in the West Cascade Avenue District is not strong. Therefore, mixed-use is considered an aspirational land use goal, but not an assumed or mandated land use in this area.

<sup>4</sup> City of Hood River Housing Needs Analysis, Chapter 4, page 33.

<sup>5</sup> The percentage of single-family detached dwellings in R-3 is based on the Hood River Housing Needs Analysis, Table 5.

### Neighborhood Commercial

The Land Use Framework includes two sites intended to provide locally-serving commercial services such as coffee shops, day care centers, and small retail shops (see Figure 4). The first site is located near Cascade Avenue, east of Mt. Adams Avenue. This site is already zoned for commercial uses. It has good visibility, pass-by traffic, and will be along a transit route in the future. It will be located within a quarter mile of approximately 560 units of housing (including existing homes). The key challenge is its location downhill from the edge of the Middle Terrace neighborhood, separated from residential areas by Wine Country Avenue. This site received the strongest support for a future locally-serving commercial site in the online survey.

The second recommended site is located in the northwest corner of the intersection of May Street and 30<sup>th</sup> Street. This site is centrally located for serving the Middle and Upper Terrace Neighborhoods. It will be within a quarter mile of approximately 1,190 units of housing (including existing homes).

### Streets Framework

The Streets Framework (Figure 5) is intended to implement the vision to create an interconnected community that includes streets, trails, and paths that are “walkable, connected, and green.” The streets of the Westside Area will comprise the largest component of the public realm. They will not only serve as transportation corridors for all users, but also as community gathering places, view corridors, utilities corridors, and other similar uses. A highly-connected street system is essential to creating a cohesive community.

The Streets Framework depicts the hierarchy of street types for the Westside Area, consistent with the street classifications used in Hood River’s Transportation System Plan (TSP): Minor Arterials, Collectors, and Local Streets (see Figure 6). To supplement this adopted hierarchy, the Streets Framework also depicts “Neighborhood Connector” Streets. The Neighborhood Connectors are selected local streets that are intended to be continuous through neighborhoods, providing direct and convenient connectivity. They are graphically shown as straight lines, but do not need to be rigidly straight alignments. They may be curved or shaped to natural features of the land provided that they still create a direct and convenient local street connection. Neighborhood Connectors are local streets by definition; they will have the same cross-section, design, and standards as all other local streets.

The Hood River TSP was the starting point for creating the Streets Framework. Updates to the TSP roadway and functional classifications for several streets in the Westside Area have been identified. The primary update is the relocation of the North-South Minor Arterial that is the extension of Mt. Adams Avenue to May Street in the TSP. As the city grows, this extension is expected to be a critical connectivity improvement in western Hood River that alleviates a significant amount of traffic from other corridors such as Cascade Avenue, Rand Road, and even 13<sup>th</sup> Street. Three alternatives were evaluated for this key route (see Appendix B for a detailed evaluation). The recommended route (“Alignment D”) runs from Wine Country Avenue to May Street in the transition area between the West Neighborhood and the Middle Terrace Neighborhood. The rationale for this alignment is that it:

- Can be designed to be less steep than other alternatives;
- Has less overall impact on developable properties;
- Avoids placement of a Minor Arterial at the front of the future school; and
- Has less disruption of neighborhood connectivity than other alternatives.

Figure 5. Streets Framework

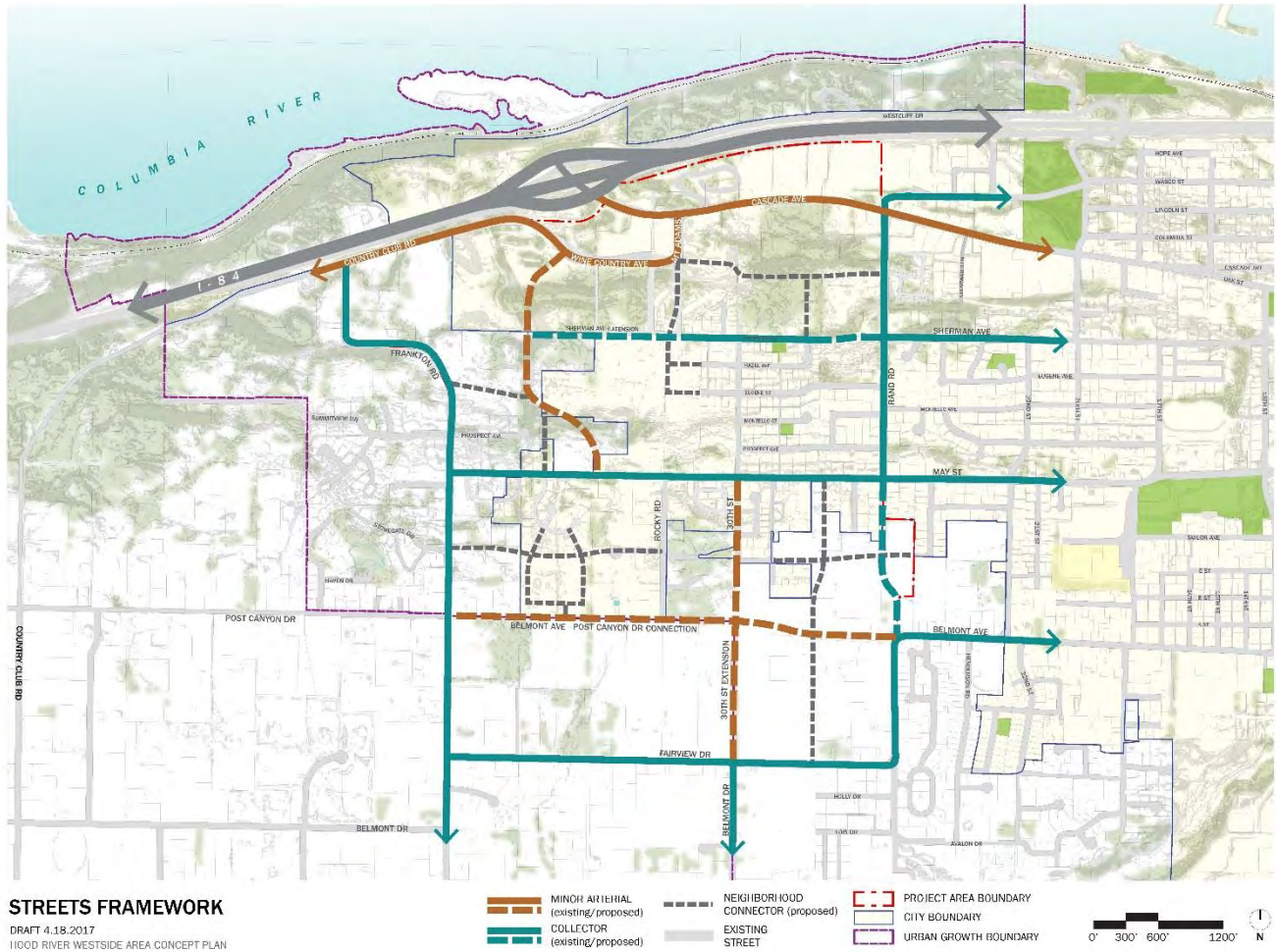
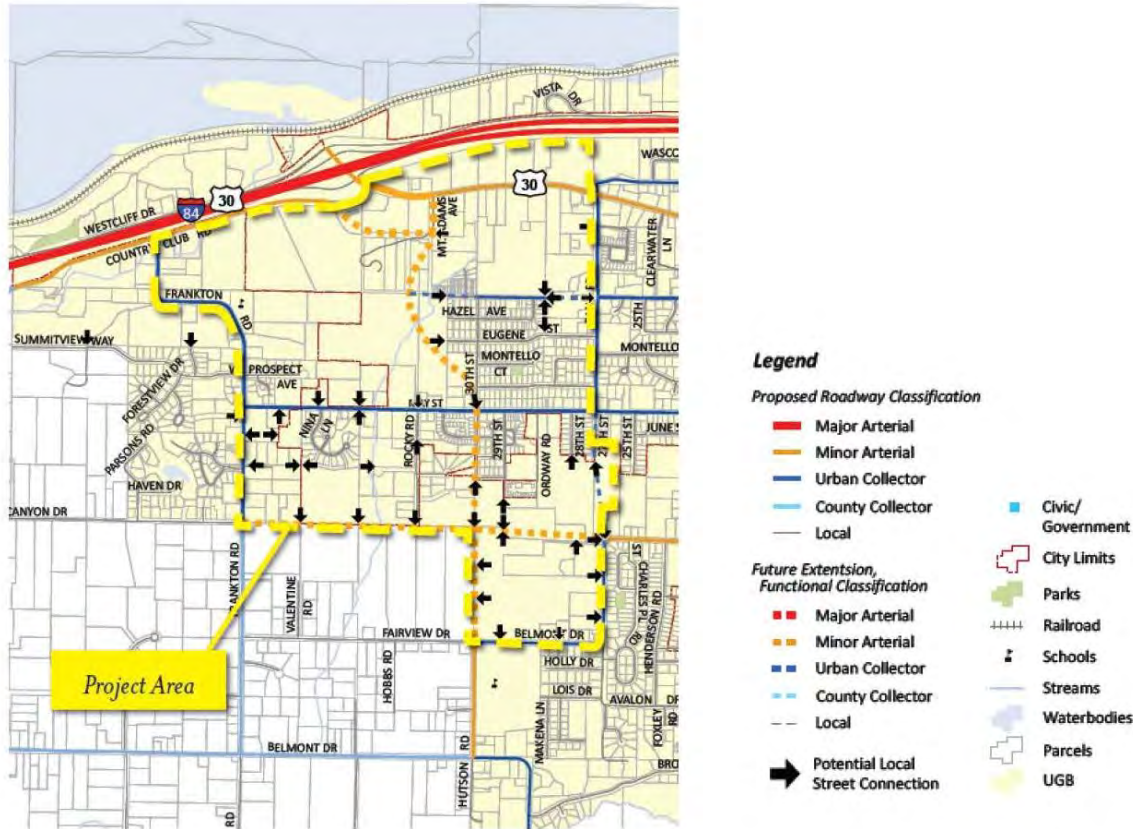


Figure 6 below depicts the City’s adopted TSP Functional Classification Map, with annotations indicating “Potential Local Street Connections.” After TAC and CAC consideration of Figure 5, the TSP map will be updated. The update will combine recommendations from the Westside Area Streets Framework, including local street connections, with existing TSP recommendations.



Figure 6. City of Hood River Roadway Functional Classification



### Alignment D Design Concept

Street cross-sections will be prepared as part of the Concept Plan. Alignment D requires special consideration so that it is designed as a context-sensitive street that balances the multiple issues of active transportation, north-south mobility, neighborhood impact, connectivity, physical constraints, and cost. It will serve the function of a Minor Arterial, but must be the most “people-friendly” Minor Arterial that can be implemented. With that goal in mind, the project team will be evaluating the following considerations for the design of Alignment D:

- **Center turn lane:** Not continuous; turn pockets where needed. Result is a 2-lane street instead of the typical 3-lane street.
- **Auto lane widths:** 11 feet instead of 12 feet.
- **Bike lanes:** Evaluate alternatives. On-street lanes (typical); buffered bike lanes; shared auto-bike lane in downhill direction; or hybrid.
- **Design speeds and curve radii.** Evaluate accommodating slower speeds.
- **Storm water.** Incorporate low impact designs.

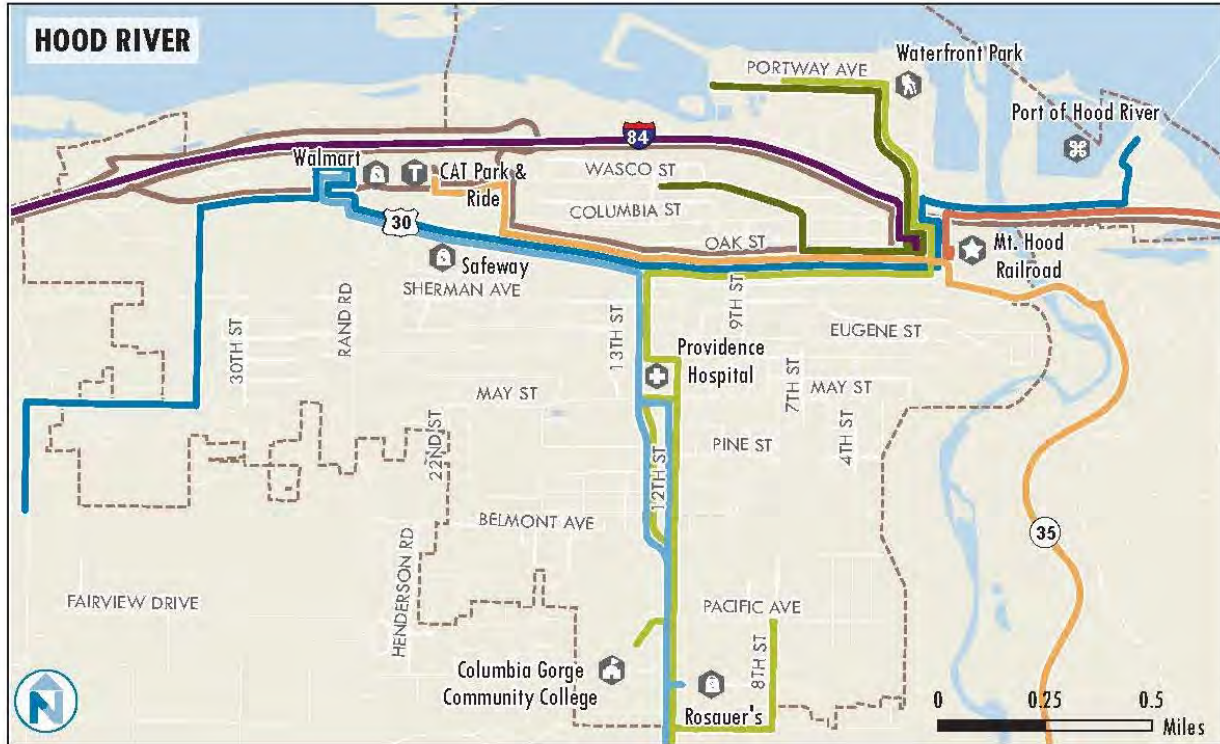
### Potential for Transit

One of the guiding principles for this plan is to “plan land uses and transportation facilities so the area may be served by fixed route transit in the future.” In order to achieve this, the plan area must have good major connections to the rest of the city, an internal multi-modal circulation network that allows residents to access transit facilities, and sufficient residential density to support transit service.

Parallel to the Concept Plan work, Columbia Area Transit has been preparing a Transit Master Plan for Hood River County, which includes transit service to the Westside Area. At this time, the basic concepts in the medium- and

long-term plans anticipate an "out and back" route from Cascade Avenue south on Mt. Adams Avenue to May Street, west on May Street to Frankton Road, and south on Frankton Road to Post Canyon Drive. The working maps are shown in Figure 7 and Figure 8 below.

Figure 7. Medium-Term Potential Transit Route through the Westside Area



Columbia Area Transit Fixed Routes	Frequency	Span	Service Days	Notes
Hood River Seasonal	20 minutes	12 p.m. to 10 p.m.	Friday - Sunday	Seasonal service, Friday - Sunday, May - September
Upper Valley	2 hours	6 a.m. to 9 p.m.	Monday - Friday	Service model TBD
Hood River - Government Camp	6 trips per day	6 a.m. to 6 p.m.	Daily	
Hood River - The Dalles	3 round trips per day	6 a.m., 12 p.m., and 5 p.m. trip	Monday - Friday	Local Hood River portion of route eliminated -- passengers would transfer to a local fixed-route.
Columbia Gorge Express	6 trips per day	8 a.m. to 8 p.m.	Daily	
Portland - Hood River - The Dalles	1 round trip per day		TBD day	Only one day per week provided, Columbia Gorge Express to provide daily service to Portland.
Hood River Local N/S	45 minutes	7 a.m. to 7 p.m.	Monday - Friday	Deviated fixed-route service
Hood River Local E/W	45 minutes	7 a.m. to 7 p.m.	Monday - Friday	Deviated fixed-route service

**Other Existing/Planned Routes**

- Sandy - Government Camp - Timberline Lodge
- Government Camp - Warm Springs
- Trimet Routes (Portland Metro Area)
- Community Boundary
- Columbia River Gorge National Scenic Area
- Mt. Hood National Forest



Figure 8. Long-Term Potential Transit Route through the Westside Area



Columbia Area Transit Fixed Routes	Frequency	Span	Service Days	Notes
Hood River Seasonal	20 minutes	12 p.m. to 10 p.m.	Friday - Sunday	Seasonal service, Friday - Sunday, May - September
Upper Valley	1 hour	6 a.m. to 9 p.m.	Monday - Saturday	Service model TBD
Hood River - Government Camp	6 trips per day	6 a.m. to 6 p.m.	Daily	
Hood River - The Dalles	3 round trips per day	6 a.m., 12 p.m., and 5 p.m. trip	Monday - Saturday	Local Hood River portion of route eliminated -- passengers would transfer to a local fixed-route.
Columbia Gorge Express	6 trips per day	8 a.m. to 8 p.m.	Daily	
Portland - Hood River - The Dalles	1 round trip per day		TBD day	Only one day per week provided, Columbia Gorge Express to provide daily service to Portland.
Hood River Local N/S	30 minutes	7 a.m. to 7 p.m.	Monday - Saturday	Fixed-route service (deviation removed)
Hood River Local E/W	30 minutes	7 a.m. to 7 p.m.	Monday - Saturday	Fixed-route service (deviation removed)

**Other Existing/Planned Routes**

- Sandy - Government Camp - Timberline Lodge
- Government Camp - Warm Springs
- Trimet Routes (Portland Metro Area)
- Community Boundary
- Columbia River Gorge National Scenic Area
- Mt. Hood National Forest

### Pedestrian and Bicycle Connections

Pedestrian and bicycle routes are a key component of the Concept Plan. In the November 2016 online open house, connecting neighborhoods with bicycle lanes was the highest-ranked transportation issue, with nearly two-thirds of respondents rating the issue as "Very Important." Off-street walking paths and a connected system of sidewalks also received high scores, with over half of respondents rating the issue as "Very Important."

The Pedestrian and Bicycle Connections Framework (Figure 9) depicts a connected network of pedestrian paths, bike routes, and trails that go "to and through" each neighborhood and district of the Westside Area. The goal is to provide many options for active transportation and reduced reliance on vehicle travel. The plan builds on designated and existing routes, including the Historic Columbia River Highway State Trail, the Westside Trail, and routes in the



adopted TSP. Other connections have been added to connect activity centers such as the planned parks and schools.

Each of the trail and path segments have been evaluated and classified. Figure 10 describes the type, intended users, width, and surface type for each segment. The width and surface types are preliminary and subject to refinement during design.

Figure 9. Bicycle and Pedestrian Connections

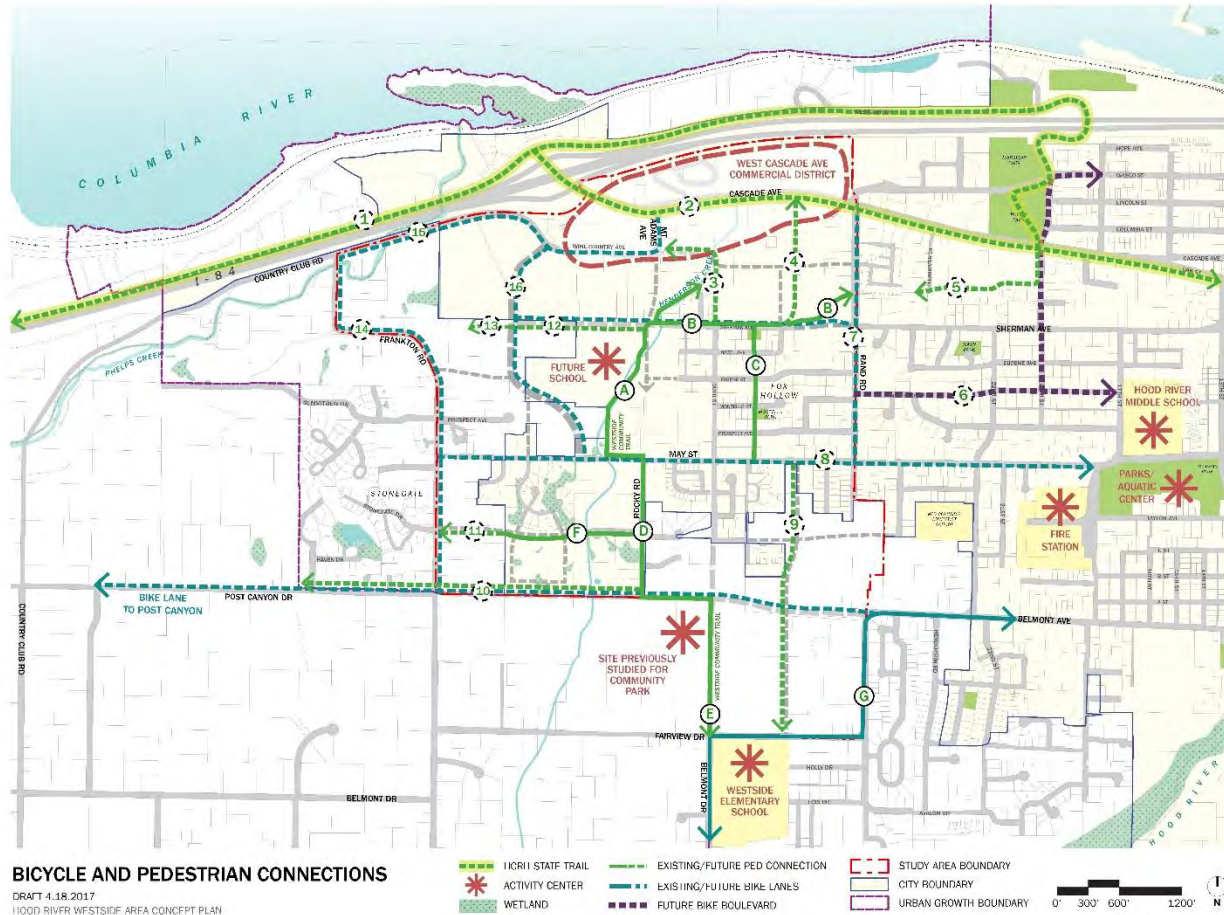


Figure 10. Bicycle and Pedestrian Connection Classifications

**EXISTING TRAIL/PATH**

Trail Segment	Type	Users	Approximate Width	Surface *
(A)	Westside Community Trail, between May & Sherman, then along Henderson Creek		~4'	Gravel, Dirt
(B)	Westside Community Trail, along Sherman		5'	Concrete Sidewalk
(C)	Fox Hollow Pedestrian Path		~4'	Asphalt
(D)	Westside Community Trail, on Rocky Road		~6'	Shared with Asphalt Road
(E)	Westside Community Trail, between Rocky Road & Fairview		~3'	Gravel
(F)	Westside Community Trail, west of Rocky Road		~4'	Gravel, Dirt
(G)	Belmont/Fairview Bike Lanes		5'	Asphalt (paved shoulder, unmarked)

**PROPOSED TRAIL/PATH**

(1)	Historic Columbia River Hwy Trail		12'	Asphalt
(2)	Historic Columbia River Hwy Trail, south side of Cascade Ave		12'	Asphalt or Concrete
(3)	30th Street North Extension		6' Bike Lane, 5' Sidewalk †	Asphalt Bike Lane, Concrete Sidewalk†
(4)	Westside Community Trail extension to Cascade Ave		~4'	Gravel, Dirt
(5)	Westside Community Trail extension east to 20th St		~4'	Gravel, Dirt
(6)	Bike Boulevard on Montello and 20th Street		~6'	Shared Asphalt Road
(7)	Rand Road Bike Lanes		6'	Asphalt
(8)	May St Bike Lanes		6'	Asphalt
(9)	Upper Terrace Neighborhood Trail: May to Fairview		~6'	Asphalt/Wide Sidewalk
(10)	Post Canyon Bike Lanes/Sidewalk		6' Bike Lane, 5' Sidewalk †	Asphalt Bike Lane, Concrete Sidewalk†
(11)	Westside Community Trail extension west to Frankton		~4'	Gravel, Dirt
(12)	Sherman Ave Bike Lanes/Sidewalk		6' Bike Lane, 5' Sidewalk †	Asphalt Bike Lane, Concrete Sidewalk†
(13)	Trail from Sherman to Frankton		~4'	Gravel, Dirt
(14)	Frankton Bike Lanes		6'	Asphalt
(15)	Country Club Bike Lanes		6'	Asphalt
(16)	Future Collector Bike Lanes		6'	Asphalt

† Preliminary. Final cross-sections to be determined during design

\* Preliminary. Final surface materials to be determined during design.

## Park and Open Space Framework

The Westside Area Vision Statement calls for “open spaces and parks that support community gathering and a connection to nature.” The overall parks and open space concept is that a connected system of open space be created through coordinated planning of the following elements:

- Up to three new neighborhood parks to serve the Westside Area.
- A new community park, with the location to be determined in a future update of the Park and Recreation District’s Master Plan.
- Open space at the future school site west of 30<sup>th</sup> Street.
- A riparian corridor adjacent to Henderson Creek, preliminarily sized at 25 feet on either side of the creek. This may also be a good location for an off-street walking path or multi-use trail.
- Retention of tree groves throughout the project area as much as practical.
- Limited development of terraced areas that are 25% slope and greater, except where needed for street connections and pedestrian connections, resulting in a network of public and private open spaces that can benefit birds and wildlife.
- Trail corridors.
- Open space tracts that are designed as part of Planned Unit Developments, higher density and mixed-use projects, and community gathering spaces.

The precise locations of parks have yet to be determined, but the concept is that one neighborhood park should be located within each of the three residential neighborhoods, with the possibility of a community park of 20-30 acres that may or may not replace a neighborhood park within the Westside Area. Based on a preliminary evaluation of neighborhood park need for the Westside Area, the Land Use Framework will require approximately 14 acres for neighborhood parks. The needed acreage calculated in this Concept Plan is preliminary; the plan assumes and recommends that it be officially determined as part of an update of the Park and Recreation District’s Master Plan for the area.

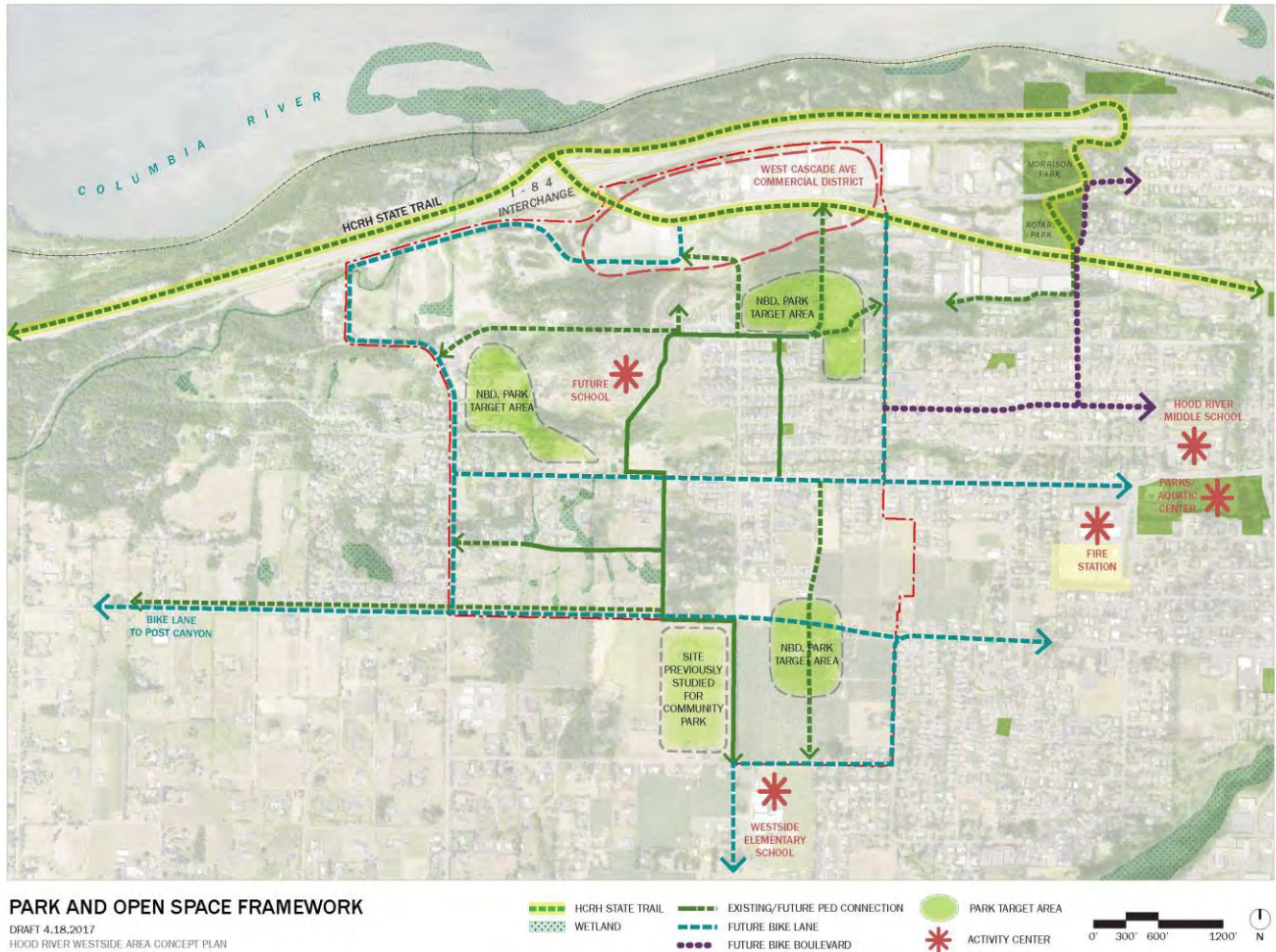
The Park and Open Space Framework identifies “target areas” for neighborhood parks (see Figure 11). These areas are based on a preliminary evaluation by the project team of the following criteria:

- Available buildable land (no existing development or environmental constraints);
- Proximity to natural features that could be incorporated into the park;
- Central location within the neighborhood; and
- Accessible by future pedestrian connections.

The neighborhood park target areas are preferred locations, but they are not intended as mandatory locations. Flexibility will be needed to acquire parks through a variety of means: advance acquisition, dedication during development review, gifting, etc. The Park and Open Space Framework is intended to be flexibly applied.



Figure 11. Park and Open Space Framework



## Gateway Area Framework

The area around the Exit 62 Interchange is a major gateway into the City of Hood River. The Gateway Area Framework provides design guidance to integrate the gateway area into the broader neighborhood and city, and provide an attractive entrance to the City. The Gateway Framework builds on previous gateway designs prepared through a community planning process as part of the Historic Columbia River Highway project in 2010 (see Appendix F).

The Gateway Area Framework is intended to:

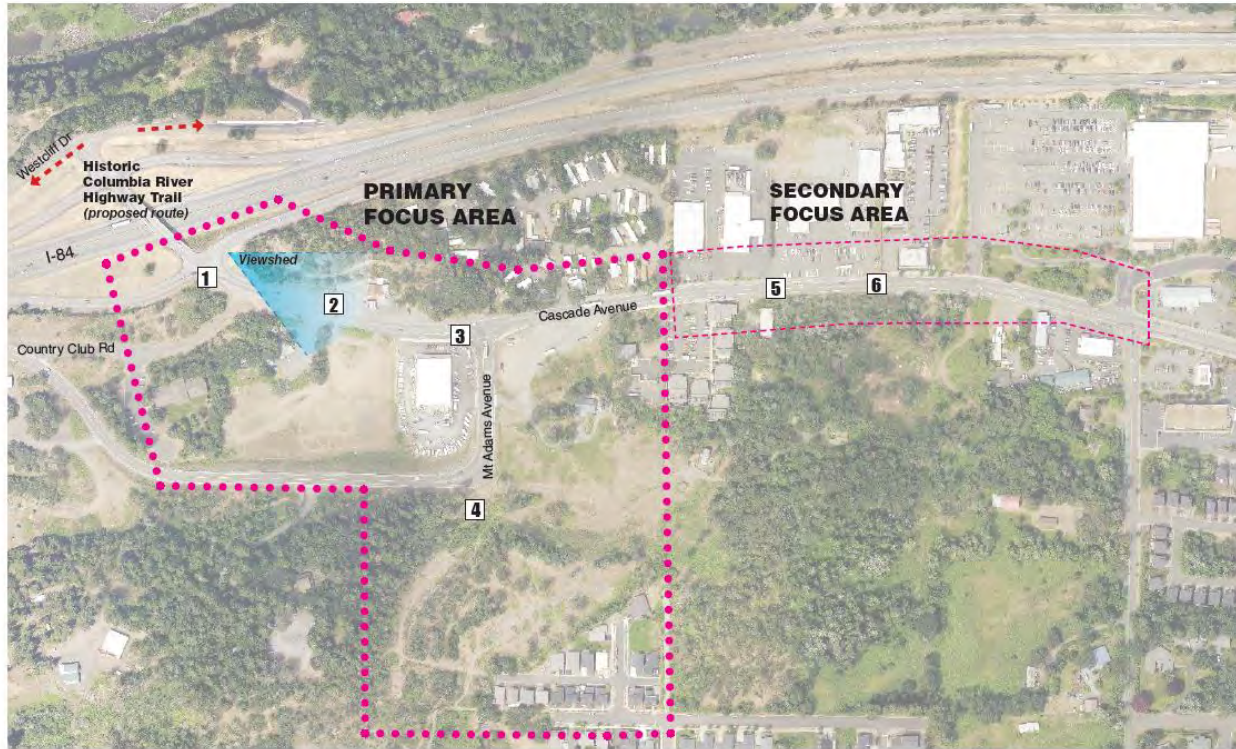
- Provide an attractive and welcoming entrance into Hood River.
- Emphasize existing natural landscape features, including native pine and fir trees, basalt rock outcrops, and views of the surrounding landscape.
- Reverse the auto-dominance of the area that exists today.
- Accommodate all modes of travel: cars, trucks, pedestrians, bicycles, and transit.
- Support the integration of the West Cascade Avenue branch of the Historic Columbia River Highway State Trail into the streetscape of West Cascade Avenue.

Two options will be prepared to implement the above goals. The first option is the Gateway Area under the currently planned signalized intersection, and is included below in Figure 12 and Figure 13. The second option (which is being



prepared at the time of the production of this report) evaluates what the intersection and Gateway Area would look like if improved with a roundabout. The roundabout is only a concept for study; ODOT has not approved it and no funding source currently exists for it. Final intersection design is subject to ODOT standards and approval. Also, partner agencies will need to agree to Cascade Avenue road design changes and reflect changes in Programmatic Agreement #19942 that governs expectations about Historic Columbia River Highway.

Figure 12. Gateway Area Existing Conditions & Issues



1 Offramp intersection with Cascade Ave. features a prominent 76 gas station sign and nothing to mark that a traveler is entering Hood River



2 Cascade Avenue itself is auto-oriented, with another gas station sign, a billboard and no pedestrian or bicycle facilities. Commercial property frontage is not well-defined.



3 Intersection with Mt Adams is auto-dominated, without crosswalks and adjacent storage properties not screened. Mature pines provide some landscape character.



4 Mt Adams looking south could be a memorable introduction to West Hood River, if the 'wall' of mature pine trees can be retained and adjoining commercial properties screened with landscape.



5 Cascade Avenue has intermittent sidewalks and unscreened parking lots, making the district feel automobile-dominated.



6 Cascade Avenue east of Mt Adams features intermittent sidewalks and street trees. Vegetation on south edge will likely be replaced with future development.

Figure 13. Gateway Recommendations



**\*\*NOTE:** Intersection treatment alternatives will be evaluated if certain cost and minimizing impact thresholds are feasible.



# IMPLEMENTATION

## Regulatory Ideas

The process of crafting the preferred alternative has identified regulatory ideas that will help with the successful implementation of the plan. The following tables (Table 3 and Table 4) represent an initial list of regulatory ideas that will support implementation of the Concept Plan. This list is intended for consideration in the Westside Area, with the understanding the City will determine, prior to adoption, whether any of them should instead be considered for citywide application.

**Table 3. Regulatory Ideas Supporting Implementation of the Concept Plan – Residential Standards**

No.	Regulatory Idea	Intent and Notes
1	Revise the minimum lot size standard for R-2 to 4,000 square feet	<ul style="list-style-type: none"> <li>This revision implements an idea recommended in the Hood River Housing Strategy.</li> </ul>
2	Minimum density requirement	<ul style="list-style-type: none"> <li>Requires applicants to provide a minimum of X% of their maximum density (e.g. 80% in the Portland area)</li> <li>Assures planned densities are implemented</li> <li>Supports affordable housing, land use efficiency, and the certainty of funding for infrastructure</li> </ul>
3	Affordable housing bonus	<ul style="list-style-type: none"> <li>Provide additional development capacity for projects that assure workforce and/or affordable housing is provided, without requiring a Planned Unit Development</li> <li>This provision would potentially increase the planned capacity of the Preferred Scenario to be closer to the Strong Scenario Alternative considered in Appendix B, linking the increase to affordability</li> </ul>
4	Residential design standards	<ul style="list-style-type: none"> <li>Supports compatibility between different types of housing</li> <li>Enables community safety through “eyes on the street”</li> <li>Creates better streetscapes</li> </ul> <p>Examples of “simple” design standards:</p> <ul style="list-style-type: none"> <li>Garages – recessed and maximum wall length along street</li> <li>Main entrances – front doors should face streets</li> <li>House plan variety – no two adjacent or opposite homes may have same facades</li> <li>Design menu – Menu of design requirements (e.g. front porches) is provided; applicants must meet a minimum number of them (e.g. Sandy: 5 of 13)</li> </ul>
5	Mix of housing provisions	<ul style="list-style-type: none"> <li>For projects larger than X acres, require Y types of housing to be provided</li> <li>Intent is to ensure a mix of housing occurs in larger projects</li> </ul>
6	Limitations on development on steep slopes	<ul style="list-style-type: none"> <li>Allow development on slopes over 25% only in specified situations; allow transfer of density</li> <li>Supports retention of the terrace edges as open space.</li> </ul>
7	Setbacks to Henderson Creek	<ul style="list-style-type: none"> <li>Define setbacks for Henderson Creek to preserve an open corridor; allow transfer of density</li> </ul>



8	Clarify definition and allowance of certain housing types	<ul style="list-style-type: none"> <li>Add explicit definitions for cohousing, cluster housing, cottage housing and other innovative housing types to ensure they are clearly permitted by the code</li> </ul>
9	Accessory Dwelling Unit (ADU) streamlining	<ul style="list-style-type: none"> <li>Identify ways to make the ADU approval process more certain and efficient, while meeting compatibility and other goals</li> <li>ADUs are a good tool for providing additional affordable housing units</li> </ul>
10	Parking reductions and exemptions	<ul style="list-style-type: none"> <li>Allow reduction of parking ratios in specified situations (e.g. provision of affordable housing)</li> <li>Parking is a significant factor in site planning and therefore density and affordability</li> </ul>
11	Cottage housing code	<ul style="list-style-type: none"> <li>Cottage housing has unique and innovative site design requirements</li> <li>Standards that are tailored to this housing type will help applicants provide cottages, which are generally smaller and affordable options</li> </ul>
12	Residential and Mixed-Use development in General Commercial (C-2) Zone	<ul style="list-style-type: none"> <li>Update minimum density requirements, tailored to the Country Club Road and West Cascade Avenue districts.</li> </ul>

**Table 4. Regulatory Ideas Supporting Implementation of the Concept Plan – Commercial Standards**

No.	Regulatory Idea	Intent and Notes
1	Building orientation	<ul style="list-style-type: none"> <li>Orient buildings to streets instead of parking lots</li> <li>Require primary entrances to face streets, plaza, courtyard or similar pedestrian space</li> <li>Increases pedestrian safety and comfort</li> <li>Reduce auto-dominance</li> </ul>
2	Drive-up and drive-through uses and facilities	<ul style="list-style-type: none"> <li>Limit drive-up and drive-through uses and facilities in certain areas to reduce auto-dominance</li> </ul>
3	Commercial building design	<ul style="list-style-type: none"> <li>Creates interesting streetscapes</li> <li>Beautifies the gateway to Hood River</li> <li>Supports overall pedestrian environment</li> <li>Commercial design standards will typically address: <ul style="list-style-type: none"> <li>Articulation</li> <li>Change in materials</li> <li>Horizontal lines: base, middle, top</li> <li>Pedestrian shelter: awnings, canopies, recesses</li> <li>Screening mechanical equipment</li> </ul> </li> </ul>
4	Civic space and pedestrian amenities	<ul style="list-style-type: none"> <li>Provides seating areas, pedestrian lighting and similar amenities to increase building quality</li> </ul>
5	Parking location	<ul style="list-style-type: none"> <li>Locate parking to the sides or rears of buildings</li> </ul>
6	Access management	<ul style="list-style-type: none"> <li>Implements access management policies</li> <li>Reduces or consolidates driveways to increase safety and quality of the streetscape</li> </ul>

*Note: Hood River's Zoning Code has design standards that apply to buildings between 25,000 and 50,000 square feet in the C-2 General Commercial Zone (17.03.050.M)*

## APPENDICES

- A. TAC/PAC Membership
- B. Selecting the Preferred Alternative
- C. Transportation Impact Analysis
- D. Roundabout Analysis
- E. Online Open House #2 Survey Summary
- F. 2010 Exit 62 Concept Plan

## APPENDIX A: TAC/PAC MEMBERSHIP

# Memorandum



4/19/2017

**To:** Technical and Project Advisory Committees  
**Cc:** Project Team and Committees  
**From:** Hood River Project Management Team  
**Re:** Preferred Concept Plan Report  
Appendix A – TAC/PAC Membership

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This is a placeholder for the TAC/PAC Membership list, which will be produced for the final report.

## APPENDIX B: SELECTING THE PREFERRED ALTERNATIVE

# Memorandum



4/19/2017

**To:** Technical and Project Advisory Committees  
**Cc:** Project Team and Committees  
**From:** Hood River Project Management Team  
**Re:** Preferred Concept Plan Report  
Appendix B – Selecting the Preferred Alternative

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## INTRODUCTION

This memo provides a summary of the analysis of alternatives and rationale for the recommendation for various component parts of the Preferred Alternative Concept Plan. These components are:

1. Land Uses (Section 1)
2. North/South Connector (Section 2)
3. Neighborhood Commercial Location (Section 3)

In each of the above sections, this memorandum describes:

- Alternatives reviewed
- Key issues and findings
- Feedback from technical/public advisory committee members (see correspondence and meeting minutes in Attachment A to this memorandum)
- Feedback received during the open house survey (note: for a full analysis the open house survey, see separate report)
- Conclusions and recommendations

## SECTION 1. LAND USES

### Alternatives Reviewed

First established in the Land Use Program memorandum,<sup>1</sup> the process has evaluated three alternatives for land use in the Westside Area. Each alternative (other than the Base Case) has a combination of changes to the City/County zoning map, as well as changes to the zoning text that affect how the Westside Area is expected to develop. Through discussions with the advisory committees and Project Management Team, they were refined to the alternatives described below in the Alternatives Analysis Report.

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<sup>1</sup> See January 12, 2017 ECONorthwest memo: “Draft Land Use Program.”

### The Base Case Scenario

This alternative is the build-out of the Westside Area under its current zoning. It is not a proposed alternative. Rather it is a “no change” baseline for use in comparing the scenarios. It assumes continuation of all existing plans and regulations, including the Comprehensive Plan, zoning, Transportation System Plan, public facility plans, etc.

### Moderate Increase in Workforce and Affordable Housing Scenario

This alternative increases workforce and affordable housing, arranged into walkable neighborhoods. Three distinct changes to the Base Case are assumed:

- Rezoning all Urban Low Density Residential (R-1) land to Urban Standard Density Residential - A (R-2A) and Urban High Density Residential (R-3), except in existing Planned Unit Developments.
- In this scenario, the R-2 zone is modified to allow smaller lots as suggested in the City’s Housing Strategy. For the purpose of this analysis this modified zone is referred to as the R-2A<sup>2</sup> zone, and features a minimum lot size of 4,000 square feet, versus 5,000-square feet in the existing R-2 zone, and resulting in development at 8.4 Dwelling Units/Acre (DU/AC) versus 7.7 DU/AC in R-2.<sup>1</sup>
- Designating roughly 23 acres of Urban High Density Residential (R-3) land at key locations (rezoning from the existing R-1 or R-2 designation, depending on location).
- Assuming a modestly denser level of development in the R-3 zones than recent trends show (20.3 DU/AC versus 16.4 DU/AC in the base case).<sup>3</sup>

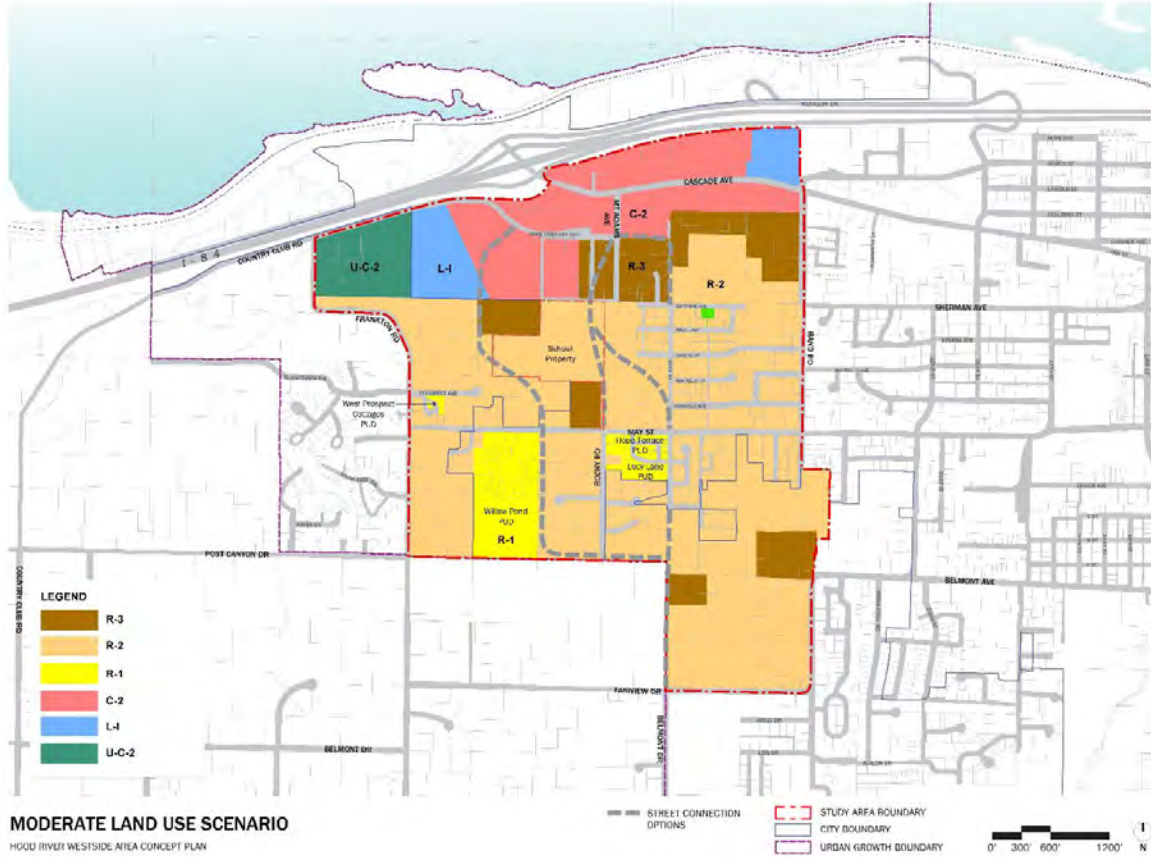
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<sup>2</sup> The R-2A “A” identifier is added for clarity. The modified zone was referred to as R-2 in the Alternatives Report.

<sup>3</sup> The increase in built densities is an assumed market response to the adoption of the Concept Plan, i.e. that a larger percentage of apartments will be built in R-3 in the future following adoption of the Concept Plan, as compared to past trends. See [Land Use Program memo](#) dated 1/12/17, page 12.



Figure 1. Moderate Scenario Land Use



### Strong Increase in Workforce and Affordable Housing Scenario

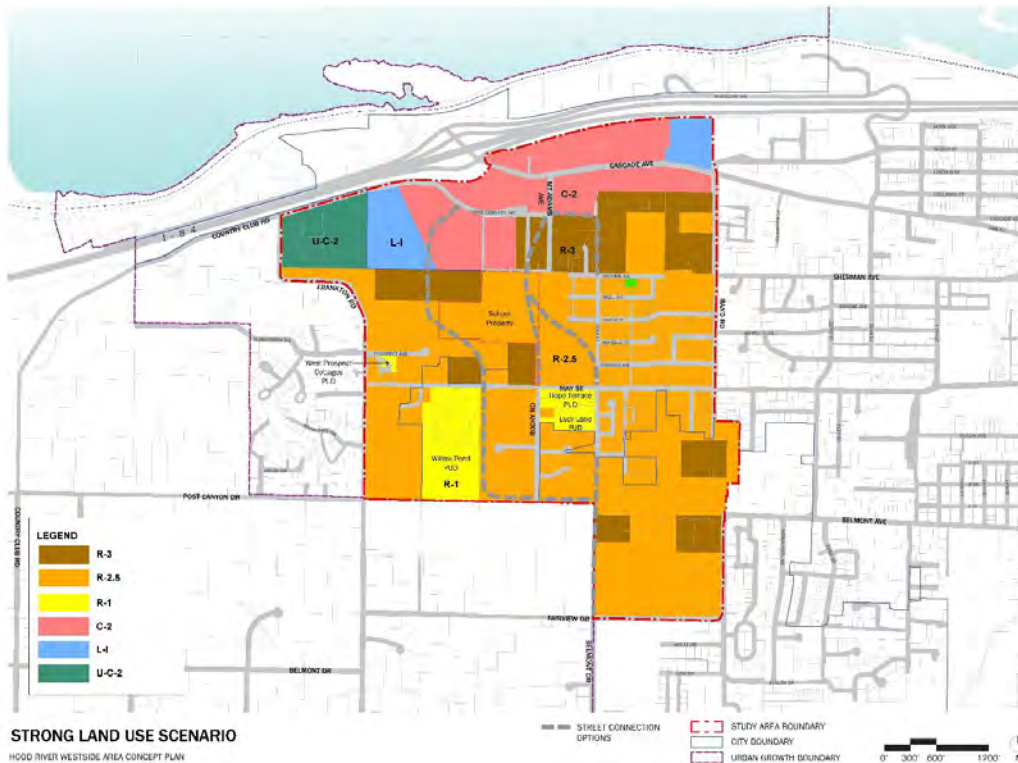
This scenario proposes a strong increase in workforce and affordable housing, arranged in walkable neighborhoods. It is meant to show the results of substantial changes in the zoning code and zoning map with the purpose of increasing capacity for all housing types and emphasizing a range of affordable housing types, from small-lot single-family housing to apartments. This scenario proposes changes to zoning, density, housing types, and land uses to emphasize the production of more workforce and affordable housing. Four distinct changes to the Base Case are assumed:

- Rezoning all Urban Low Density Residential (R-1) land to Urban Standard Density Residential and Urban High Density Residential (R-3), except in existing Planned Unit Developments.
- In this scenario, the R-2 zone is modified to allow significantly smaller lots as suggested in the City’s Housing Strategy. For the purpose of this analysis this modified zone is referred to as the R-2B zone featuring a minimum lot size of 3,000 square feet, versus the existing 5,000-square feet in R-2, and resulting in development at 12 DU/AC versus 7.7 DU/AC in R-2.<sup>4</sup>
- Designating roughly 42 acres of R-3 land to key locations (rezoning from the existing R-1 or R-2 designation, depending on location).

<sup>4</sup> Previously referred to as R-2.5 in the Alternative Report. The unique identifier of R-2B is used for clarity.

- Assuming a somewhat denser level of development in the Urban High Density Residential (R-3) zone than recent trends show (20.3 DU/AC versus 16.4 DU/AC in the base case).<sup>3</sup>

Figure 2. Strong Scenario Land Use

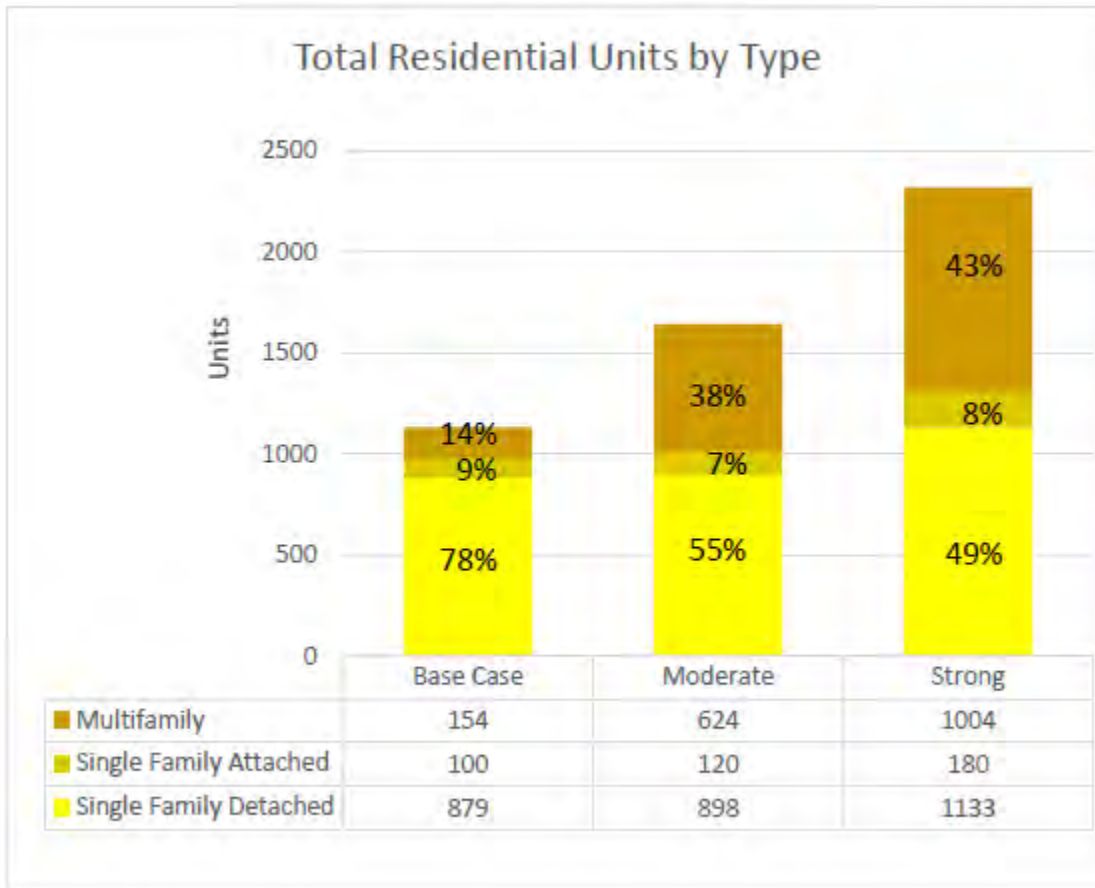


New residential uses by type, for each scenario, are shown below. For the purposes of this analysis, housing types are grouped into the following three categories:<sup>5</sup>

- **Single-family detached** includes single-family detached units and manufactured homes on lots and in mobile home parks.
- **Single-family attached** includes all structures with a common wall where each dwelling unit occupies a separate lot, such as row houses or townhouses.
- **Multifamily** is all attached structures (e.g., duplexes, triplexes, quadplexes, and manufactured units, and structures with five or more units) other than single-family detached units, manufactured units, or single-family attached units.

<sup>5</sup> Categories are based on the housing type definitions used in the "City of Hood River Housing Needs Analysis" report dated September 2015.

Figure 3. Total Residential Units by Type



### Key Issues and Findings

The Alternatives Report used the project Guiding Principles, supported by performance indicators, as criteria to evaluate each land use alternative. Selected key issues and findings from that report are included below. Also included where relevant are trends or specific quotes from the Online Open House on these topics.

#### Guiding Principle A: Making good use of the Westside’s Limited Land Supply

One major issue tested by these alternatives is the overall capacity of the Westside Area to accommodate growth of the City of Hood River. Guiding Principle A states that the project should “create livable neighborhoods that make good use of the Westside’s limited land supply.” The Westside Area contains most of the remaining undeveloped residential land within the City of Hood River Urban Growth Boundary (UGB). Due to complexities with the Columbia River Gorge Scenic Area, expanding the UGB is a difficult process. It is important to utilize the land in the Westside Area efficiently for needed housing and achieving other community goals. In addition to overall capacity, the report examined housing mix and transitions between residential zones.

Because the Strong scenario accommodated more housing in a wider variety on this limited land base, it scored the highest on this issue.

**Guiding Principle B: Create well-planned and commercially successful mixed-use districts in the Westside gateway area**

The Westside Area contains one of the primary gateways into the City of Hood River. This analysis examines how differences in the land use scenarios may impact the role and character of the gateway area. Both the moderate and strong scenarios present opportunities to establish well-planned and commercially successful districts in the gateway area with a greater number of housing units within walking distance of the gateway area. Both scenarios anticipate retention of existing larger sites for commercial and light industrial uses, with increased residential population densities in close proximity.

**Guiding Principle C: Create a plan that works for all ages and abilities of the community.**

The American Planning Association’s “Planning for Aging-Supportive Communities” report identifies several recommendations for specific projects and programs to allow for what they call “Aging-in-community” in the categories of housing options, mobility, and public realm design (see list in Alternatives Report). The broader range of housing types, increased feasibility of locally-serving commercial areas and mixed-use Cascade Avenue district, and the increased amount of park land for “Third Spaces” suggest that the strong scenario performs somewhat better.

**Guiding Principle D. Provide a range of densities and housing types, increasing affordable housing choices in Hood River.**

As described in Guiding Principle A, the Strong scenario provides the greatest amount and range of housing types.

**Guiding Principle E: Incorporate natural features and a sense of place into each neighborhood and district.**

The natural features and sense of place within each neighborhood and district of the area will be an important part of the Concept Plan under any scenario.

Overall, higher density development can more easily incorporate natural features into site plans through clustering, and providing more space for public open space rather than private yards. Multifamily structures in particular can take advantage of sensitive slopes. Both the Moderate and Strong scenarios have similar potential for retaining key natural features.

**Guiding Principle F: Include open space and parks integrated in neighborhoods.**

Both the moderate and strong scenarios provide greater need for neighborhood parks, as well as a greater opportunity for achieving parks through development.

**Guiding Principle G. Provide a connected transportation network with walkable, bike-friendly and green streets.**

The land use scenarios are not expected to be the primary driver of the transportation network – there are key decisions regarding the alignment of the Mt. Adams Extension (see Section 2), but a highly connected, walkable, and bike-friendly transportation system is a foundational component of all scenarios. The Strong Scenario scored somewhat higher, as the ability of higher-density zones to accommodate a higher level of connectivity while providing more housing units and allowing for more design flexibility in lot patterns suggests that the strong scenario may perform somewhat better.



### Guiding Principle H. Promote active and healthy living through community design.

Active and healthy living are part of the Concept Plan through the system of connected open spaces, trails, bikeways, and complete streets that will promote active and healthy living. This is not expected to differ between these scenarios.

### Guiding Principle I. Plan land uses and transportation facilities so the area may be served by fixed route transit in the future.

There is currently no fixed route transit within the study area, but this long-range plan will create a neighborhood that will be serviceable by transit in the future. Additional land in the R-2A/R-2B zone throughout the study area and multifamily units in R-3 land located near the potential transit route provide significantly more new transit-accessible units in the moderate and strong cases.

Other guiding principles are described in the alternatives report, but did not show strong differences between the scenarios and are not included in this memo.

## Feedback Received

Several questions on these topics were asked during the Online Open House. Summaries and selected individual quotes are provided below:

- **Concern about impacts of development to the existing trail network.** The Westside Trail is a valuable amenity for residents within and surrounding the Westside Area. The trail follows rights-of-way that are planned for future streets, and passes through the undeveloped school district property. In order to implement various of the project's Guiding Principles, a high-quality trail system must be put into place that allows for recreational use and pedestrian connections through the area. This need is even greater as the number of residents in the area increases.
- **Concern about impacts of proposed street connections to property values.** Allowing higher-density development is one way to reimburse property owners impacted by the proposed North-South connection through the area.
- **Concern about loss of open space/rural character.** Under existing zoning, much of the Westside Area is expected to build out at R-1 (7,000 SF minimum lots) and R-2 (5,000 SF minimum lots), which would likely have the effect of placing much of the Westside's open space into private back yards. Well-designed multifamily developments, cluster housing, and other higher-density developments can accommodate more residents while preserving land for publicly-accessible trails and parks.
- **Acknowledged need for traffic improvements in Gateway Area, support for pedestrian/bicycle improvements, but some concern about costs for aesthetic improvements.** Overall, there was a general acknowledgment of the need for traffic improvements in the Gateway Area. Many respondents indicated support for the proposed improvements, particularly in regards to the roundabout option. A large number of respondents also expressed support for improvements to the pedestrian and bicycle network, with particular mention given to the extension of the State Historic Highway Trail.
- **Only moderate support for rezoning R-1 lands to R-2 in the Westside Area, and for reducing minimum lot size of R-2.** These strategies were notably less popular among responses who identified as Property owners/residents/business owners in the Westside Area than with residents of Hood River and surrounding communities. Of those supportive of reducing the minimum lot size of R-2 land, there was a clear preference for the moderate scenario's reduction from 5,000 SF to 4,000 SF.
- **Fairly low level of support of the amount and locations of R-3 high-density housing in the Strong Scenario.** This level of concern about R-3 housing in the area, along with several specific comments on the subject, suggest that location and design of these units will be very important. Good connections to amenities, commercial areas, and open spaces are a must for multifamily housing.

- **Concern about infrastructure and services to accommodate growth.** Many survey respondents expressed concern about the effect that population growth will have on already-strained transportation infrastructure, schools, and civic services.
- **Support for Cohousing as a way to meet “missing middle” housing need.** In addition to zoning designations and lot size requirements, many members of the public described this area as suitable for “cohousing” and would like for it to be part of the concept plan.
- **Need to go further than just zoning changes to assure affordability.** Several respondents stated that merely providing greater capacity for smaller homes does not go far enough in ensuring affordability – multifamily units could easily be built as expensive condos with mountain views.

## Conclusions and Recommendations

Initial conclusions were provided as part of the Alternatives Analysis Report and summarized in Figure 4 below. In an evaluation of how well each alternative met the Project Guiding Principles, the moderate Scenario performed somewhat better than the Base Case, and the Strong Scenario performed even better. This is largely due to the fact that many of the project guiding principles relate to efficient use of land, and having enough homes in the area to support a connected, walkable environment with access to services and a community of varied ages and incomes.

However, as evidenced by the feedback received, the compatibility of additional housing with existing homes, overall design characteristics, and provision of adequate services to support Westside residents are of paramount importance. In order to achieve the benefits of a more efficient use of land in the Westside, while addressing concerns of compatibility, the project team makes the following conclusions and recommendations:

- Increasing the capacity and residential efficiency of land in the Westside is fundamental to supporting housing affordability. Up-zoning much of the land in all neighborhoods of the Westside Area to R-2 is recommended as an appropriate strategy, because R-1 is not an efficient use of land.
- Increasing the flexibility for small lots, cottage homes and other missing middle housing in R-2 is also an appropriate strategy for the preferred Land Use Framework. Of the two alternatives, 4,000 SF minimum lot size in R-2 supports affordability while being more compatible with existing development in the area than the 3,000 square foot option. Given the choice, over 60% of respondents favored this choice over reducing the R-2 minimum to 3,000 SF.
- The total amount of R-3 housing can be reduced somewhat and still result in significant increases in housing capacity and affordable choices. The team recommends removal of one "block" of R-3 in the Upper Terrace neighborhood (from that shown in the Strong Scenario) that was not creating a synergistic "node" at that location, as well as placing a block of R-3 adjacent to a potential Neighborhood Commercial site at the northwestern corner of 30<sup>th</sup> Street & May Street.
- The land uses on the Commercial and Industrial properties in the West Cascade District and Country Club District should be retained. Design standards should be considered for those areas to make the area less auto-dominated and more pedestrian friendly.

The above recommendations result in a hybrid of the ideas contained within the Moderate and Strong Scenarios.

Details about the evaluation are found in the Preferred Alternative Report. The summary table from the report is included as Figure 4 below.

Figure 4. Summary of Guiding Principles from Alternatives Report

Guiding Principle	Base Case	Moderate Scenario	Strong Scenario
A. Create livable neighborhoods that make good use of the Westside's limited land supply.	+	++	+++
B. Create well-planned and commercially successful mixed-use districts in the Westside gateway area.	++	+++	+++
C. Create a plan that works for all ages and abilities of the community.	++	++	+++
D. Provide a range of densities and housing types, increasing affordable housing choices in Hood River.	+	++	+++
E. Incorporate natural features and a sense of place into each neighborhood and district.	++	+++	+++
F. Include open space and parks integrated in neighborhoods.	++	++	++
G. Provide a connected transportation network with walkable, bike-friendly and green streets.	++	++	+++
H. Promote active and healthy living through community design.	+++	+++	+++
I. Plan land uses and transportation facilities so the area may be served by fixed route transit in the future.	+	++	+++
J. Integrate Westside Elementary School and future new schools as key community places.	++	+++	+++
K. Promote human-scaled building designs.	++	++	++
L. Plan for efficient water, sewer and storm water infrastructure, utilizing green practices for storm water management.	++	++	++
M. Provide a realistic infrastructure funding strategy.	++	++	++
<b>TOTAL<sup>6</sup></b>	<b>++ (24)</b>	<b>++ (30)</b>	<b>+++ (35)</b>

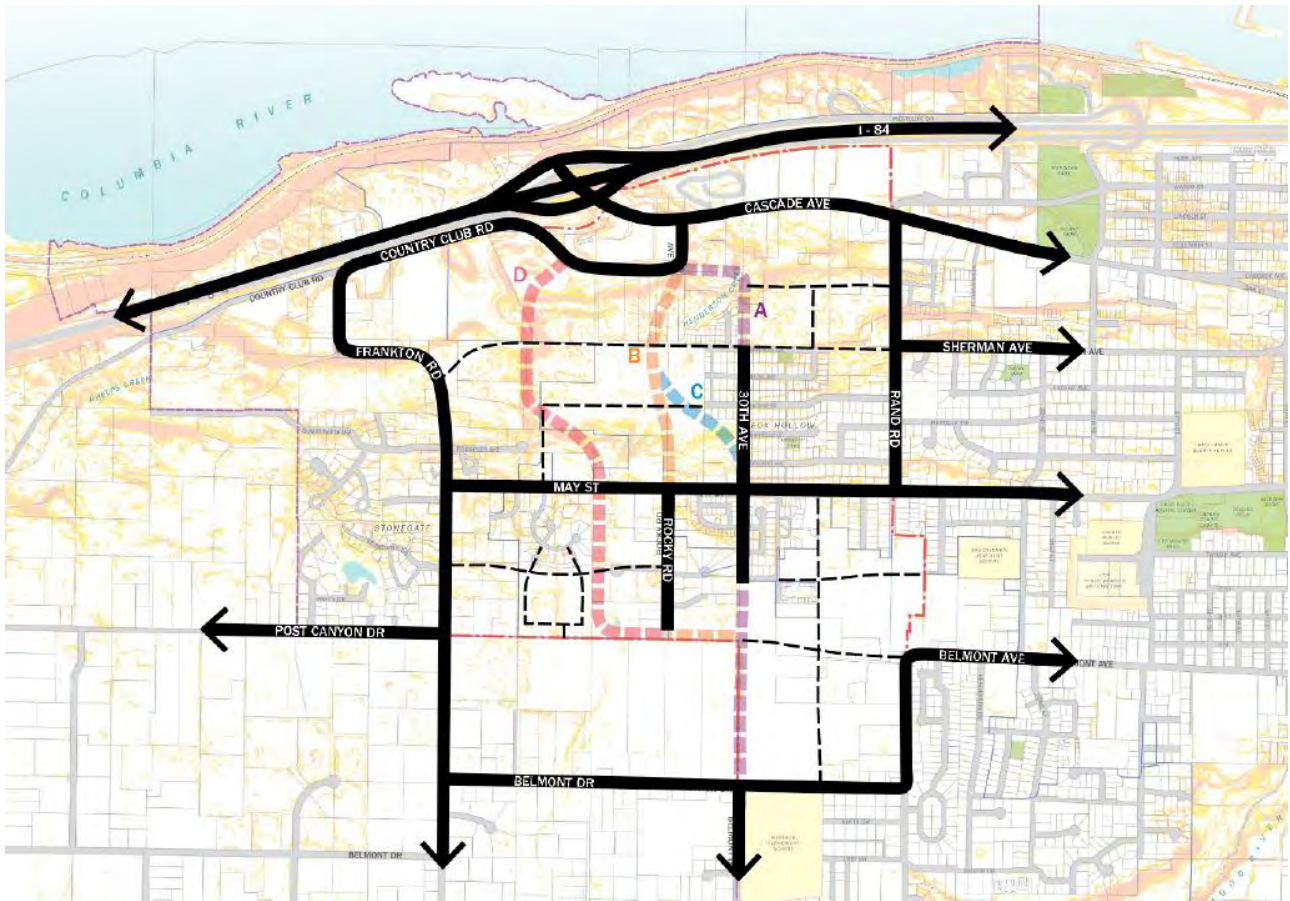
## SECTION 2. NORTH/SOUTH CONNECTOR

### Alternatives Analyzed

A key transportation issue is the proposed alignment of a major North/South street located between Wine Country Avenue and May Street. As the city grows, this extension is expected to be a critical connectivity improvement in west Hood River that takes a significant amount of traffic from other corridors such as Cascade Avenue, Rand Road, and even 13th street. Four options for this connection have been evaluated in the Concept Plan process. These options are listed below and shown on Figure 5.

- Option A – Extension of 30<sup>th</sup> north to meet Mt. Adams Ave
- Option B – Connection from Mt. Adams Ave. to Rocky Road
- Option C – As drawn in Transportation System Plan, connection from Mt. Adams Avenue to 30<sup>th</sup>
- Option D – Westerly connection south from Wine Country Road to May Street and potentially beyond

Figure 5. North-South Connection Options



### Key issues and Findings

The impact of the North-South Connector alignment will be significant in the development of the Westside Area. In order to help inform the decision-making process, the Project Team drafted a set of criteria for use in evaluating the alternatives. These were further refined by City of Hood River planning and engineering staff. The following list was a starting point in discussion among city planning and engineering staff, along with other members of the project team:

- **Cost.** High-level construction costs, accounting for differing road lengths and construction obstacles.
- **Attractiveness/Traffic Impact.** This criterion examines the utility of the connector in the context of the City's transportation system.
- **Engineering.** Technical attributes and constructability of the alignment, including grades, earthwork, known rock blasting needs, wetlands, intersection landings, and offsets.
- **Neighborhood impacts,** including east-west connectivity, visual impacts, pedestrian/bicycle circulation, and transit accommodation.
- **Future extensions.** Ability of the alternative to connect further south beyond May Street.
- **Utilities.** Does the alignment coincide with identified Capital Improvement Projects or other infrastructure needs.
- **Easements.** Ease with which buildable land can be obtained throughout the alignment.



The Project Team created site studies to evaluate the likely impacts on property development of each of these alternatives. These include general assumptions about development and the local street network on various properties – it is important to note that the site studies are intended for the purposes of evaluation, and are not intended to be prescriptive of how the area will develop.

Key findings from the site studies included:

- The school property will be key central land use and community destination.
- Alignment D is closer to the edge of West Neighborhood and appears to have less impact on future development potential, while B and C cut through vacant parts of the Middle Terrace neighborhood and have more impact due to cut and fill slopes that are needed to maintain a maximum grade of 10 percent. Even with these relative differences, it is important to note that Alignment D requires significant fills which will affect connectivity in the West Neighborhood.
- Each alignment has different connectivity potential for the east-west local streets due to the grades and access spacing requirements assumed for an Arterial street. D has the best potential for overall connectivity in the area.
- Sherman Avenue will be an important street to connect the Middle Terrace and West Neighborhoods and provide access to the school from the north. However, it requires substantial fills and property impacts in one section.

Figure 6. Site Study – Alignment B

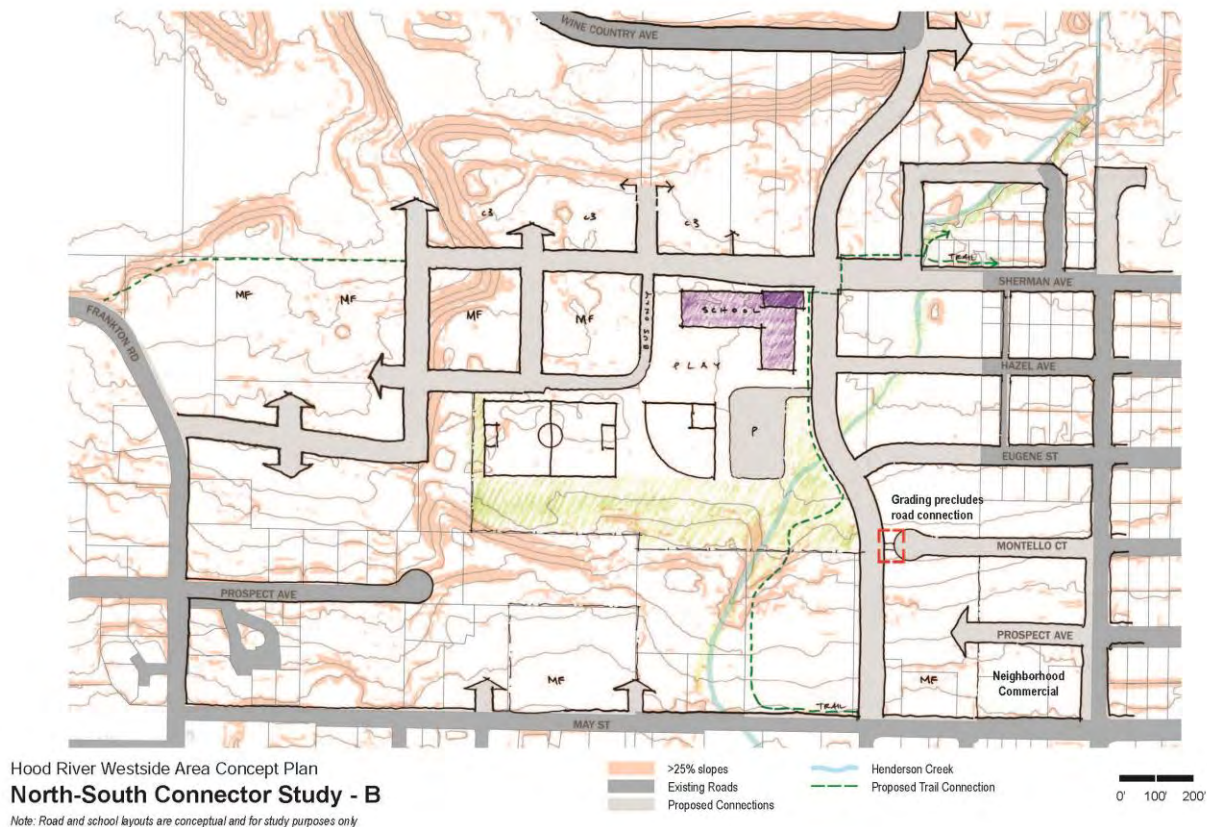


Figure 7. Site Study – Alignment C

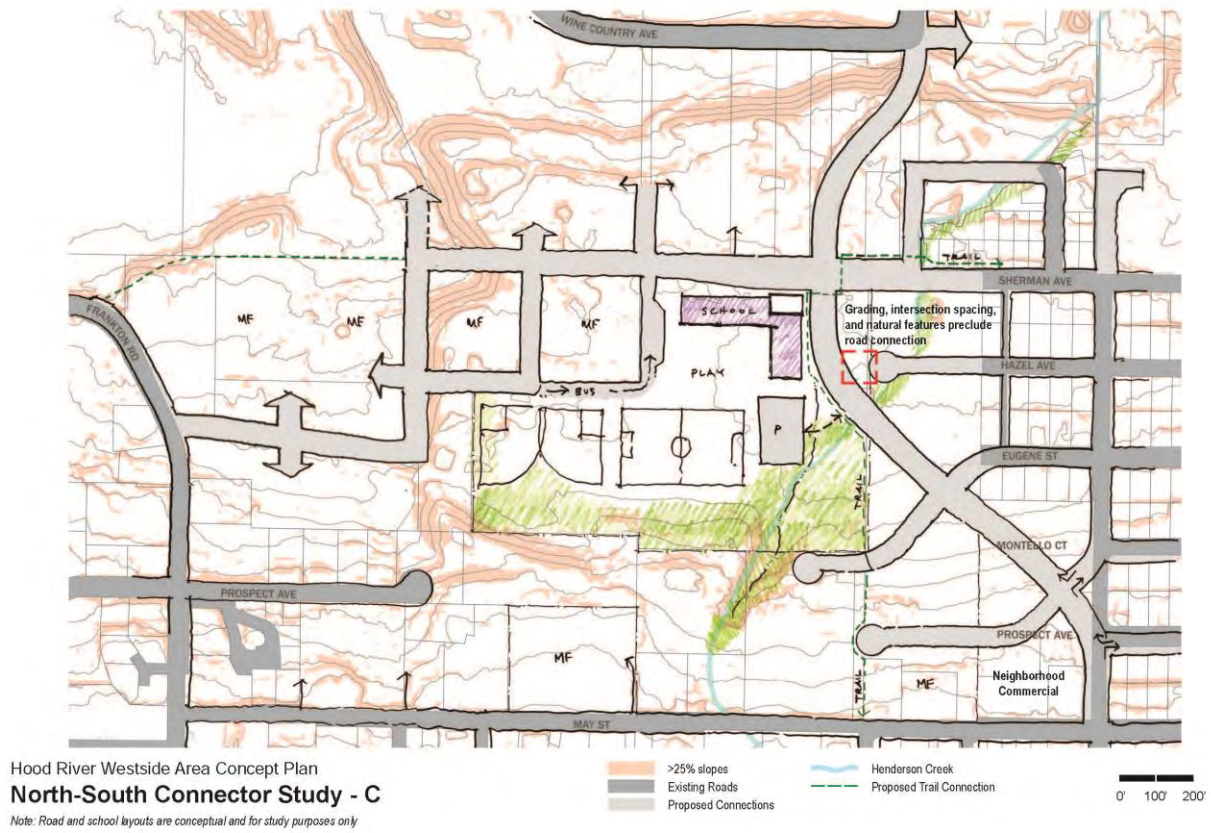
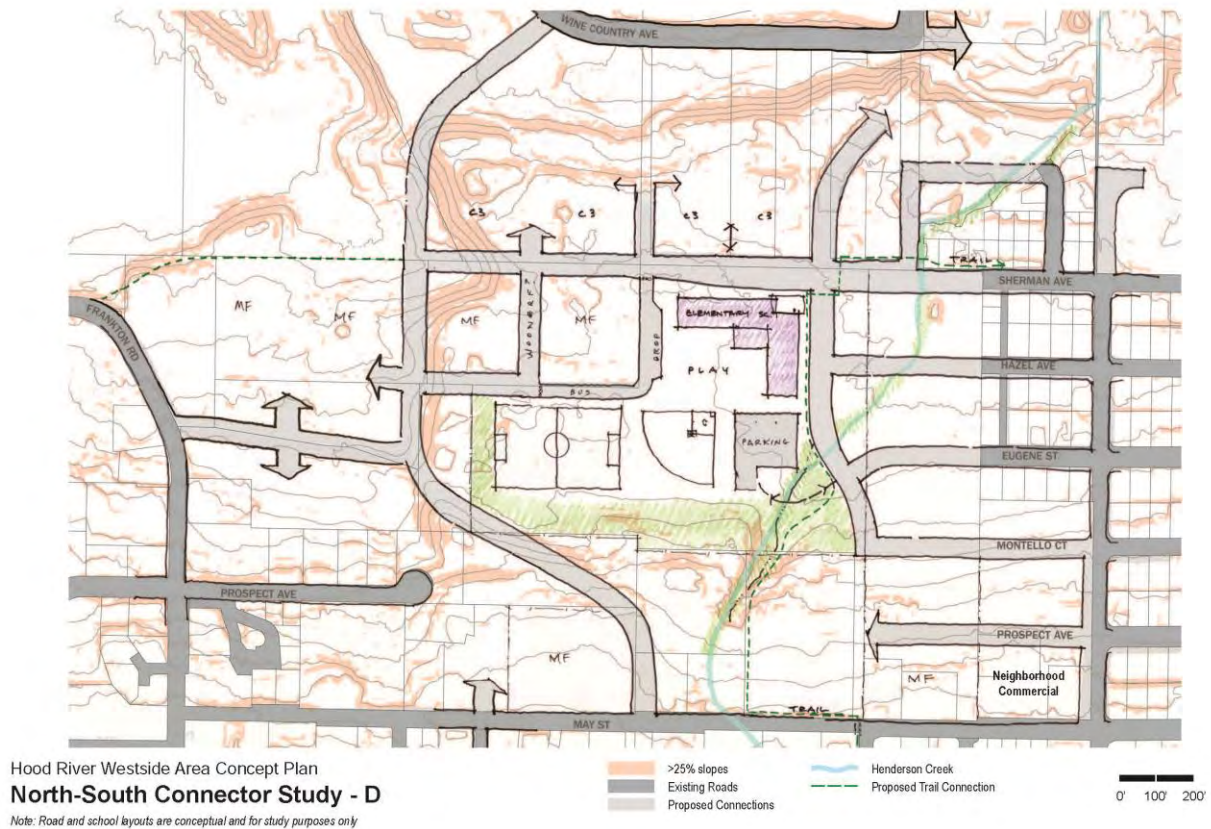




Figure 8. Site Study – Alignment D



### Feedback Received

When asked to rank the criteria by which the alternatives should be evaluated, survey respondents thought all criteria were at least somewhat important (an average score of 3 out of 5 or better). The highest-scoring criteria were Neighborhood Impacts (4.34), Environmental/Stormwater/Sewer Impact (4.11), and overall traffic impact (4.07). The lowest is feasibility for use by trucks/buses (3.3).

When asked which of these options they favored (understanding that additional analysis is needed), 44% of respondents chose Option B, and 27% chose Option D. Option C was much less popular at roughly 12%.

Some common comment themes from the survey included:

- Lots of support for a traffic light or roundabout at Cascade and Mt. Adams. This was by far the most commonly-voiced comment.
- Support of a neighborhood feel rather than the westside being bisected by a large truck route.
- Cost of acquiring property for the road.
- Limit through-access to other neighborhoods.
- Support future transit.
- Importance of safety, particularly in relation with existing and future schools in the area.
- Opposition to a large road near existing homes (such as Option C).
- Need for a north-south connection that is less steep than existing ones in this area.

## Conclusions and Recommendations

Based on the evaluation above, the Project Team has the following recommendations:

- Due to the way 30th has developed, with a narrow right of way and numerous driveways on the street, it is not suitable for the primary connection through the area. However, it may serve as a useful local-access road. If this extension were established before another north-south connection in the area, there would likely be a high amount of cut-through traffic.
- In an evaluation of options B, C, and D, the Project Team has recommended Option D. Details of the scoring is included as Attachment 2 to this memorandum. In summary:
  - This option allows for a lower-grade hill that will be beneficial during inclement weather.
  - This option facilitates a gravity sewer line that is desired by the City to alleviate pressure on a pump station in the Westside Area.
  - There is a significant amount of grading and this is the longest option, leading to higher potential costs.
  - This option does not cut through the middle of the study area as options B and C do, and may help facilitate safer connections to the school site via neighborhood routes from the South and East.
  - This option has somewhat lesser impacts on property owners, though some properties (and potentially structures) are significantly affected. It is important to note that the alignment is conceptual and subject to more site-specific design to address engineering, property impact, utilities, and other important considerations.

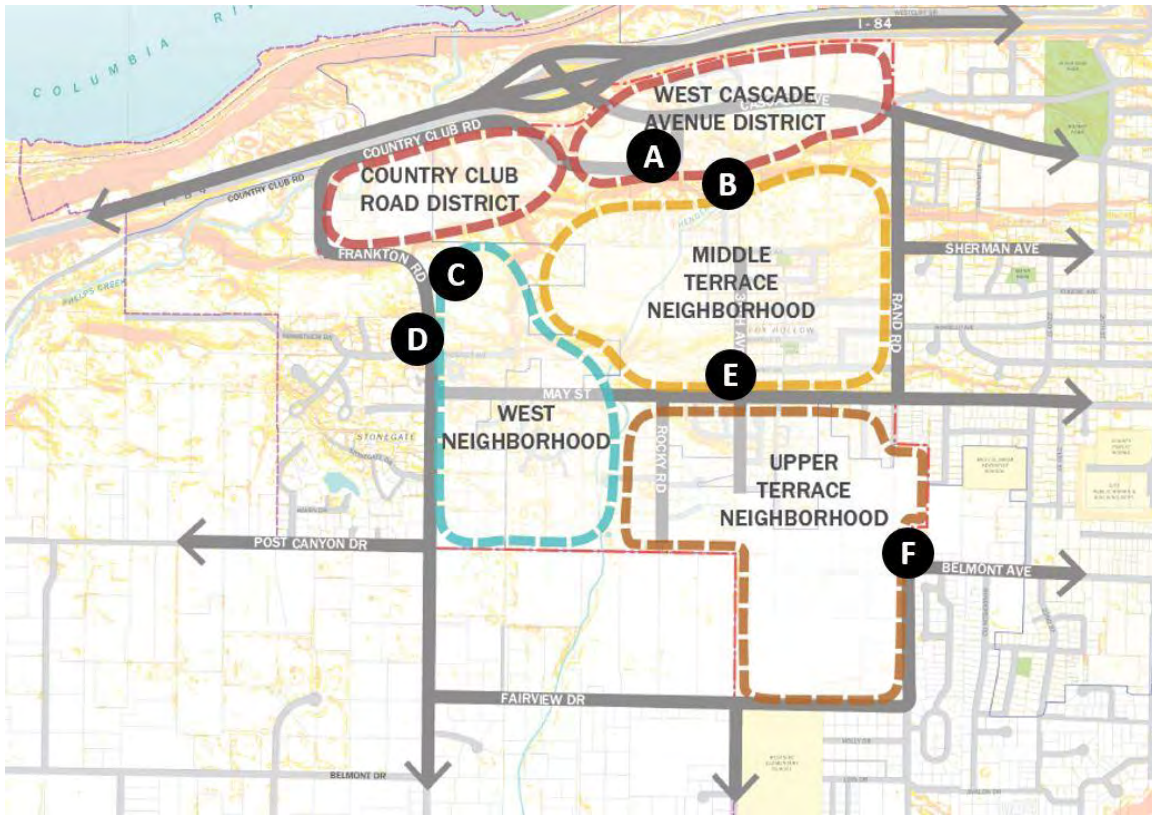
## SECTION 3: NEIGHBORHOOD COMMERCIAL SITE

### Alternatives Reviewed:

The option of including a roughly 2.5-acre neighborhood-serving node of commercial land within the Westside Area has been evaluated. There were a total of six alternative locations identified by the Project Team that may be suitable (see Figure 9). Several examples of what such a commercial center may look like were provided to TAC/PAC members and the public as an illustration.



Figure 9. Potential Locally-Serving Commercial Node Locations



**Key Issues and Findings:**

Even in the Strong Scenario, development in the Westside Area would likely support only one of these locations at most. The two basic issues in play are the amount of households nearby and the amount of through-traffic a location is likely to receive. Locations A and B are closer to Cascade Avenue, and end up as both highway-serving businesses as well as neighborhood-serving businesses. Locations further south may provide walking access to more households that do not currently have it, but may not receive enough traffic to be viable.

**Feedback Received**

There were a variety of responses to the online survey both strongly in support of and against the idea of a commercial area in the Westside.

Overall, Option A was the most favored option in the survey with over half of the responses, followed by location E with nearly 30% of responses. When asked about additional concerns/recommendations, respondents said:

- Commercial node should be located near high-density housing.
- There is not enough traffic/density to support much, if any, retail.
- Residents of this area being able to walk/bike to shops would be valuable.
- Concern about traffic or unwanted uses related to a commercial area
- Concern about taking business away from other existing commercial locations.

## Conclusions and Recommendations

Based on the above, the Project Team has the following conclusions and recommendations:

- Location A should be considered a potential site for locally-serving commercial. It is currently zoned C-2, with an existing commercial use, and does not require a zone change. As the Westside Area evolves into the western gateway for the area, this location has the potential to attract business from pass-by traffic as well as the neighborhoods of the Westside. This location was the most favored by the online survey.
- Location A should be moved to be on the east side of Mt Adams Avenue, so future residents to the south do not need to cross larger roads to reach it.
- Location E should also be considered a potential site for locally-serving commercial. This option is centrally located within the Westside Area and will be easily accessible from all three neighborhoods. This location was the second most favored by the online survey.
- The plan should include multifamily housing adjacent to Location E.

<b>Criteria</b>	<b>Weight</b>	<b>B</b>	<b>C</b>	<b>D</b>
	<b>1 Low- 5 High</b>	Score	Score	Score
<b>Cost</b>	2	5.0	4.0	3.0
<b>Attractiveness</b>	4	4.5	5.0	4.0
<b>Engineering</b>	5	1.5	2.0	4.0
<b>Neighborhood Impacts</b>	4	2.0	2.5	3.0
<b>Future Extensions</b>	2	3.0	4.0	2.5
<b>Utilities</b>	3	3.5	2.0	3.5
<b>Easements</b>	2	2.5	2.0	3.0
<b>WEIGHTED SCORE</b>		<b>2.95</b>	<b>3.00</b>	<b>3.43</b>

West Side Plan Road Alternatives Scoring Criteria					Obstacles	Earthwork	Paving	Frontage	Utilities
					\$/each	\$/Cu yard	\$/ft	\$/ft	\$/ft
<b>Criteria:</b>	<b>Cost</b>				250000	10	50	50	75
<b>Description:</b>	<p>Costs were developed as screening level construction costs for comparison purposes, not total project costs. Costs for this level of evaluation were developed assuming similar means and methods, using a baseline per foot unit pricing. Alternatives costs are differentiated by length, adding the costs of difficulties associated with obstacles like creeks, wetlands, rock outcroppings, etc. Road is assumed to be built to Commercial/Residential Neighborhood Collector street standards (60' ROW).</p>								
<b>Findings:</b>		<b>B</b>	<b>C</b>	<b>D</b>	<b>X</b>				
	Length, linear ft	2,300	2,600	3,200	4,000				
	Obstacles	1	1	1	4				
	Obstacles Cost	\$250,000	\$250,000	\$250,000	\$1,000,000				
	Earthwork Qty(yds)	71300	80600	99200	124000				
	Earthwork Cost	\$713,000	\$806,000	\$992,000	\$1,240,000				
	Paving	\$115,000	\$130,000	\$160,000	\$200,000				
	Frontage	\$115,000	\$130,000	\$160,000	\$200,000				
	Utilities	\$172,500	\$195,000	\$240,000	\$300,000				
	<b>Total Cost</b>	<b>\$1,115,500</b>	<b>\$1,261,000</b>	<b>\$1,552,000</b>	<b>\$1,940,000</b>				
<b>Scoring:</b>	<b>Points</b>	<b>Criteria</b>							
	1	Greater than \$2.5M							
	2	\$2.0M-\$2.5M							
	3	\$1.5M-\$2.0M							
	4	\$1.0M-\$1.5M							
	5	Less than \$1.0M							
<b>Results:</b>		<b>B</b>	<b>C</b>	<b>D</b>	<b>X</b>				
	<b>Total Cost</b>	<b>\$1,115,500</b>	<b>\$1,261,000</b>	<b>\$1,552,000</b>	<b>\$1,940,000</b>				
<b>Score:</b>		<b>5.0</b>	<b>4.0</b>	<b>3.0</b>	<b>2.0</b>				



## West Side Plan Road Alternatives Scoring Criteria

**Criteria:** Attractiveness

**Description:**

The selected alignment must meet the need of providing effective, efficient North-South travel through the study area. The locations of the connections to Wine Country and May St. affect the appeal of using this new route. Discussions have assumed that the farther West the connections move, the less attractive the route becomes. Traffic modeling analysis has now been applied to study the attractiveness of each alternative B,C, and D. All evaluations assume that Alignment A, the Eastern extension of Wine Country to 30th, is completed.

**Findings:**

Recent traffic modeling indicates that Alignment D is no less attractive than Alignments B or C. However, given its circuituous route between Cascade Ave. and May St., Alignment D scored lower than B or C. Because Alignment C ties into 30th Street which can be extended further south inside the UGB, Alignment C received the highest score.

**Scoring:**

Points	Criteria
1	20+% less attractive than most attractive
2	15-20% less attractive than most attractive
3	10-15% less attractive than most attractive
4	5-10% less attractive than most attractive
5	0-5% less attractive than most attractive

**Results:**

**Weight**

**B**

**C**

**D**

**X**

**Score:**

4.5

5.0

4.0

1.0

## West Side Plan Road Alternatives Scoring Criteria

**Criteria:** Engineering

**Description:**

This category covers the technical attributes and constructability of each alignment. Grades, earthwork, rock blasting, wetlands, intersection landings and offsets.

**Findings:**

Analysis performed by Vista GeoEnvironmental indicates that Alignment D maintains a maximum grade less than 7%. City staff concurred that a road grade in this range would be of great benefit to the community. Two of the three engineers in the room ranked the road grade as the most important criterion of the evaluation. The dissenting engineer thought that the west side already has winding, non-grid pattern roads and that it needs a more direct path (improving attractiveness). The scoring below largely reflects the desirability of the road grades (Alignments B and C were assumed to have a maximum grade of 10%). Road grades have a direct impact on the landings at street intersections, a sub-criterion that was accounted for. The constructability of the alternatives was discussed and it was determined that all of them will involve enormous earthwork volumes. As such the alternatives were considered equal in constructability.

**Scoring:**

Points	Criteria
1	Poor
2	Below Average
3	Average
4	Above Average
5	Excellent

**Results:**

Weight	B	C	D	X
Total Score:	1.5	2.0	4.0	0.0

## West Side Plan Road Alternatives Scoring Criteria

**Criteria:** Neighborhood Impacts

**Description:** East-West Connectivity, Visual/Compatibility, Pedestrian/Bike Circulation, Transit

**Findings:** There was consensus that Alignments B and C would interfere with E-W connectivity assuming maximum grade of 10% and associated cut and fill activity. Alignment D, which also requires massive earth work, does not seem much better. All scored low in their visual impact. Alignment D's gradual slope would appeal to pedestrians and cyclists, but is further out of the way to the majority of the population. It was determined that transit was a less-important consideration because buses can conform to the roadways available, but it was pointed out that a lesser slope would benefit buses in the winter. No clear winner in this category. Although there is no immediate plan to construct a school on the District's parcel, it seems appropriate to consider the impact of the alignment on access to the school by residents in nearby neighborhoods.

<b>Scoring:</b>	Points	Criteria
	1	Poor
	2	Below Average
	3	Average
	4	Above Average
	5	Excellent

<b>Results:</b>		<b>Weight</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>X</b>
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<b>Total Score:</b>		2.0	2.5	3.0	4.0
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## West Side Plan Road Alternatives Scoring Criteria

**Criteria:** Fututre Extensions

**Description:** Is the future southerly extension of the alignment in the preferred location? Define the preferred location. From an attractiveness perspective, from an available-land perspective, etc.

**Findings:** Alignment C makes direct use of 30th Ave, with the southerly extension located inside the UGB. The narrow right-of-way on 30th south of May St. was acknowledged but deemed acceptable subject to any needed future traffic control improvements. The southerly extension of 30th also seems favorably aligned with key destinations south of the city. Alignment B is preferred to D because Rocky Road exists south of May and would, in the near term, result in less of an offset at the UGB where the road would have to jog east and connect to 30th. The prospect of obtaining the required right-of-way for Alignment D south of May is concern given its proximity to a potential buffer along Henderson Creek, and construction may be expensive given hydrology and rocky soils in that area.

<b>Scoring:</b>	<b>Points</b>	<b>Criteria</b>
	1	Poor
	2	Below Average
	3	Average
	4	Above Average
	5	Excellent

<b>Results:</b>	<b>Weight</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>X</b>
<b>Total Score:</b>		<b>3.0</b>	<b>4.0</b>	<b>2.5</b>	<b>3.0</b>



## West Side Plan Road Alternatives Scoring Criteria

<b>Criteria:</b>	<b>Utility Needs</b>					
<b>Description:</b>	Does the alignment coincide with identified Capital Improvement Projects or other future infrastructure needs.					
<b>Findings:</b>	Alignment D facilitates a gravity sewer solution for the west side, including the Frankton sewer district which would unload the majority of the flow from Country Club Pump Station. Alignment B facilitates a storm water capital improvement project in Rocky Rd. Alignment B would also allow a gravity sewer to capture a substantial flow from the west side of the study area and unload Country Club Pump Station. It was pointed out that if Alignment D was selected, Alignment B could still built as a local street up to Eugene and the stormwater CIP could still be executed with an easement between where local street B would end and May St. Alignment C facilitates neither infrastructure improvement.					
<b>Scoring:</b>	<b>Points</b>	<b>Criteria</b>				
	1	Poor				
	2	Below Average				
	3	Average				
	4	Above Average				
	5	Excellent				
<b>Results:</b>		<b>Weight</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>X</b>
<b>Total Score:</b>			<b>3.5</b>	<b>2.0</b>	<b>3.5</b>	<b>3.0</b>

## West Side Plan Road Alternatives Scoring Criteria

West Side Plan Road Alternatives Scoring Criteria						
Criteria:	Easements					
<b>Description:</b>	<p style="text-align: center;">This category ranks the relative ease with which buildable land can be obtained throughout the entire alignment. Impacts to and resistance from property owners is taken into account here.</p>					
<b>Findings:</b>	<p>Alignment C appears to present a greater negative impact to property owners than Alignment B due to its curvilinear alignment. Alignment B is expected to be better received at its southern end near May St because a large development was previously approved that included a N-S road resembling Alignment B. At the Northern end, however, resistance is anticipated from property owner von Flotow who expressed concerns about Alignment B as fatally flawed at an advisory committee meeting. Alignment D has strong support from von Flotow who owns land between Wine Country Way and future Sherman Ave. However, between Sherman and May St, Alignment D impacts multiple parcels owned by different parties and appears to require demolition of a home, as such the procurement of easements appears challenging. In the near term, the northern portion of Alignment D appears to be a certainty and therefore it slightly outscores Alignment B.</p>					
<b>Scoring:</b>	<b>Points</b>	<b>Criteria</b>				
	1	Difficult/Numerous				
	2	Below Average				
	3	Average				
	4	Above Average				
	5	Easy/Few				
<b>Results:</b>		<b>Weight</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>X</b>
<b>Total Score:</b>			2.5	2.0	3.0	3.0

APPENDIX C: TRANSPORTATION IMPACT ANALYSIS



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## MEMORANDUM

DATE: April 17, 2016

TO: Joe Dills and Andrew Parish, Angelo Planning Group

FROM: John Bosket and Jasmine Pahukula

SUBJECT: Hood River Westside Area Concept Plan – Task 5.1 Transportation Analysis

---

The goal of the Westside Area Concept Plan is to develop an integrated land use and transportation plan for a site of approximately 450 acres located within the City of Hood River and Hood River County. The purpose of this memorandum is to address OAR 660-012-0060 Transportation Planning Rule (TPR) requirements by evaluating the transportation impacts of the proposed land use action and identifying any mitigation needed to ensure adequate facilities will be in place to support planned growth.

## INTRODUCTION

### Study Area

The study area is bound by I-84 to the north, Rand Road/27<sup>th</sup> Street to the east, Belmont Drive and the urban growth boundary (UGB) to the south, and Frankton Road to the west. The following intersections were selected for traffic operations analysis and an evaluation of potential impacts from the proposed land use action.

1. Cascade Avenue/Westcliff Drive.
2. Cascade Avenue/I-84 Westbound Ramps
3. Cascade Avenue//I-84 Eastbound Ramps
4. Cascade Avenue/Mt. Adams Avenue
5. Cascade Avenue//Rand Road
6. Country Club Road/Frankton Road
7. Frankton Road/May Street
8. May Street/30<sup>th</sup> Street
9. Rand Road/27<sup>th</sup> Street/May Street
10. Frankton Road/Post Canyon Road/Belmont Avenue
11. Belmont Avenue/30<sup>th</sup> Street
12. Belmont Avenue/27<sup>th</sup> Street



The study area and selected study intersections are shown in Figure 1.

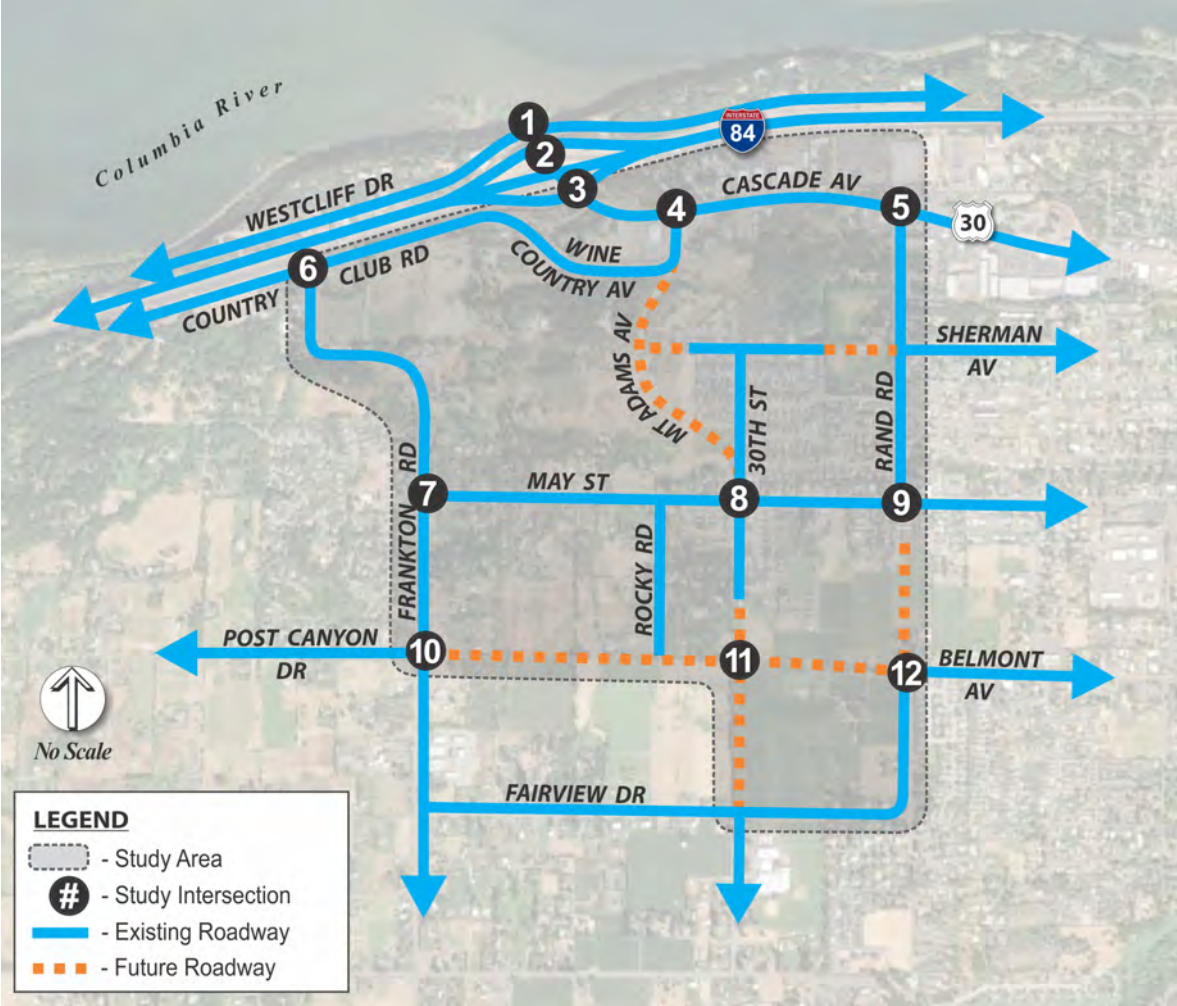


Figure 1: Study Area

## Scenarios

This analysis evaluates the following two alternatives during the weekday p.m. peak hour in the year 2040:

- Base Alternative – includes zoning consistent with the current Comprehensive Plan/Zoning and transportation improvements identified in the adopted City of Hood River Transportation System Plan (TSP).<sup>1</sup>
- Strong Scenario Alternative – includes “Strong Scenario” zoning within the Westside Area Plan boundary and a modified version of the transportation improvements identified in the City of Hood River TSP. The Strong Scenario was evaluated as a “highest trip generator” scenario, recognizing that the final preferred scenario may have less land use. DKS will prepare a sensitivity analysis to update these findings when the preferred scenario is available.

Land use and transportation network assumptions for each alternative are described in more detail in the following sections.

### Land Use Assumptions

The Base Alternative represents the existing Comprehensive Plan/Zoning that applies in the Westside Area. In other words, it does not change existing zoning to provide a baseline for use in comparing the alternatives.

The Strong Scenario Alternative represents changes to the Comprehensive Plan/Zoning to accommodate an increased amount of affordable housing and workforce by increasing housing density and providing a greater mix of housing types within the Westside Area. This scenario changes the undeveloped land within the study area to “R-2B” and R-3 zoning, which increases the opportunities for small lot, duplex/triplex, townhome, cluster developments, and apartment housing.

The 2040 Base Alternative was developed by adding nine years of housing and employment growth to the “updated” 2031 housing and employment projections from the City’s TSP. The 2031 future year housing and employment projections from the City’s TSP were updated based on the City’s 2015 Housing Needs Analysis<sup>2</sup> and 2011 Economic Opportunities Analysis<sup>3</sup>.

The 2040 Strong Scenario Alternative scenario was developed by increasing the housing and employment projections within the Westside study area. The increase in housing units and jobs was determined by full build out development potential and minimum zoning requirements for R-

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<sup>1</sup> City of Hood River Transportation System Plan, 2011.

<sup>2</sup> City of Hood River Housing Needs Analysis, September 2015, ECONorthwest.

<sup>3</sup> Hood River Economic Opportunities Analysis, June 2011, FSC Group.

2.B and R-3 zoning. The 2040 Base Alternative was adjusted to reflect the increase of housing and employment within the Westside study area by proportionally decreasing housing and employment growth from the rest of the city and allocating it within the Westside study area.

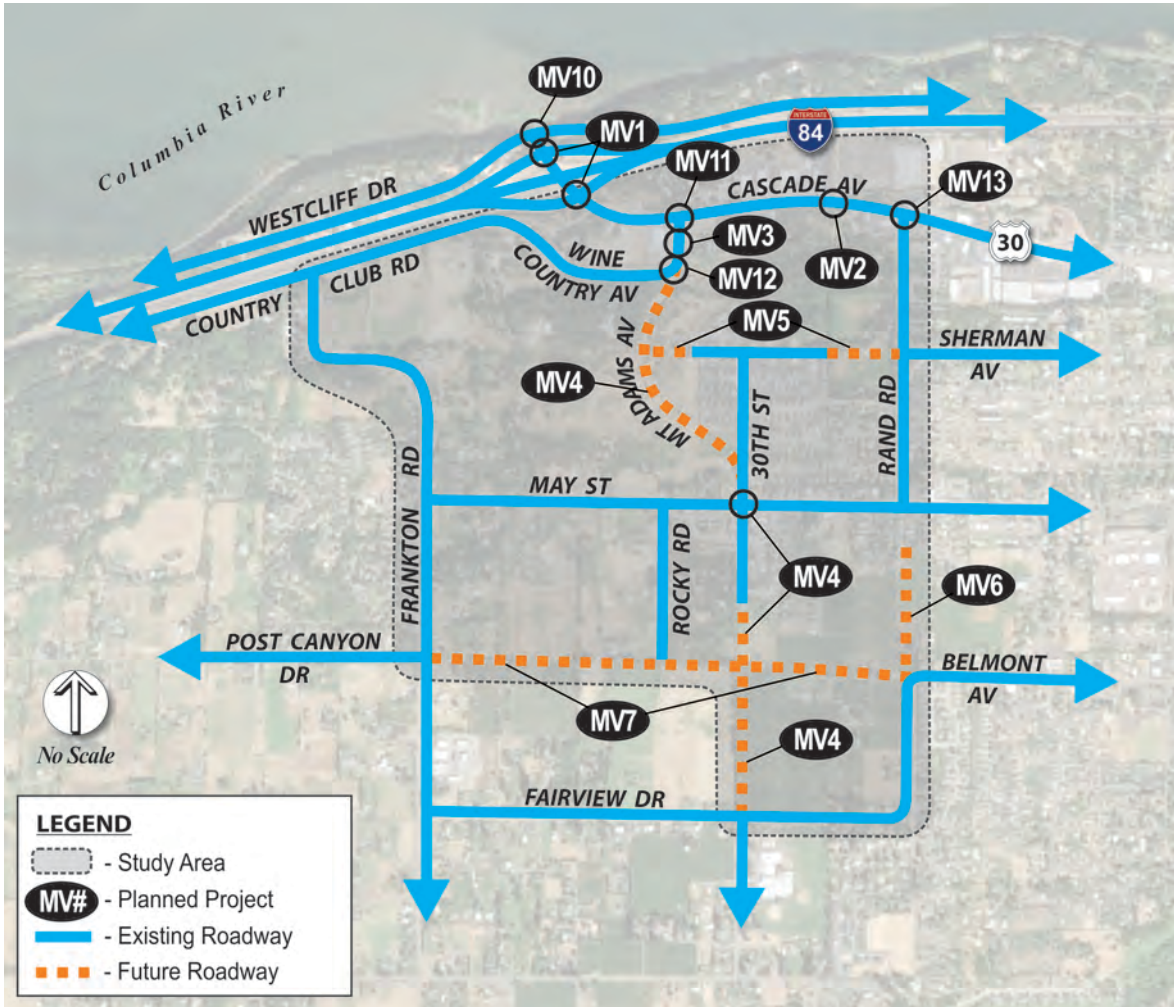
The overall housing and employment assumptions within the City of Hood River UGB were held constant between the two alternatives. The only difference was where the growth was assumed to occur.

## Transportation Network Assumptions

The projects identified in the City's TSP were used to represent assumed transportation network conditions for the 2040 Base Alternative. The projects included within the Westside Area Plan boundary are listed below and shown in Figure 2.

The naming convention is consistent with the City's TSP.

- MV1 – I-84 Exit 62 Interchange:
  - Westbound Ramps/Terminal: Construct a traffic signal, northbound left turn lane, second southbound through lane, westbound left turn lane, shared westbound through/left turn lane, westbound right turn lane.
  - Eastbound Ramps/Terminal: Construct a traffic signal, northbound right turn lane, second southbound through lane, southbound left turn lane, eastbound right turn lane.
- MV2 – Cascade Avenue (I-84 Exit 62 Interchange to Rand Road): Construct second eastbound lane from I-84 eastbound ramp terminal to Mt. Adams Avenue, second westbound lane from Mt. Adams Avenue to I-84 eastbound ramp terminal and widen to 3-lane (with a center turn lane) between Mt. Adams Avenue and Rand Road.
- MV3 – Country Club Road Realignment/Mt. Adams Avenue:
  - Cascade Avenue at Mt. Adams Avenue: Construct two northbound left turn lanes, northbound right turn lane, install yield control for eastbound right turn lane.
  - Mt. Adams Avenue at Country Club Road: Construct northbound left turn lane, northbound shared through/right turn lane, channelized southbound right turn lane under yield control, southbound through lane, southbound left turn lane, eastbound left turn lane, eastbound shared through/right turn lane, east approach for property access including a westbound left turn lane, and a shared westbound through/right turn lane.
- MV4 – Mt. Adams Avenue (Country Club to Fairview Drive): Construct Mt. Adams Avenue as a 3-lane minor arterial and construct a traffic signal at May Street/Mt. Adams Avenue (30<sup>th</sup> Street).



**Figure 2: 2040 Base Alternative Transportation Network Assumptions**

- MV5 – Sherman Avenue (Rand Road to Mt. Adams Avenue) – Extend Sherman Avenue from Rand Road to Mt. Adams Avenue
- MV6 – Rand Road (May Street to Belmont Avenue) – Extend Rand Road/27<sup>th</sup> Street from the current stub south of May Street to Belmont Avenue.
- MV7 – Belmont Avenue (Rand Road to Frankton Road) – Extend Belmont Avenue to Frankton Road.
- MV10 – Cascade Avenue/Westcliff Drive – Construct a traffic signal and eastbound right turn lane.
- MV11 – Mt. Adams Avenue/Cascade Avenue – Construct a traffic signal.
- MV12 – Mt. Adams Avenue/Country Club Road - Construct a traffic signal.
- MV13 – Rand Road/Cascade Avenue - Construct a traffic signal, eastbound right turn lane and modify the northbound and southbound approach to include a left turn lane and a shared through/right turn lane.

The Strong Scenario Alternative has the same network assumptions as the Base Alternative with the following exceptions, which are highlighted in Figure 3:

- Project MV4, the portion of the Mt. Adams Avenue extension between Wine Country Avenue (formally referred to as Country Club Road in the TSP) and May Street, is shifted to the west. This western alignment is hereafter referred to as “Alignment D.” The traffic signal on Mt. Adams Avenue at Wine Country Avenue is moved west to the new intersection of Wine Country Avenue at Alignment D.
- Sherman Avenue is extended further to the west, all the way to Alignment D. A neighborhood collector street further to the south would provide a connection between Alignment D and Frankton Road.
- The traffic signal on May Street at 30<sup>th</sup> Street is moved west to the new intersection with Alignment D.

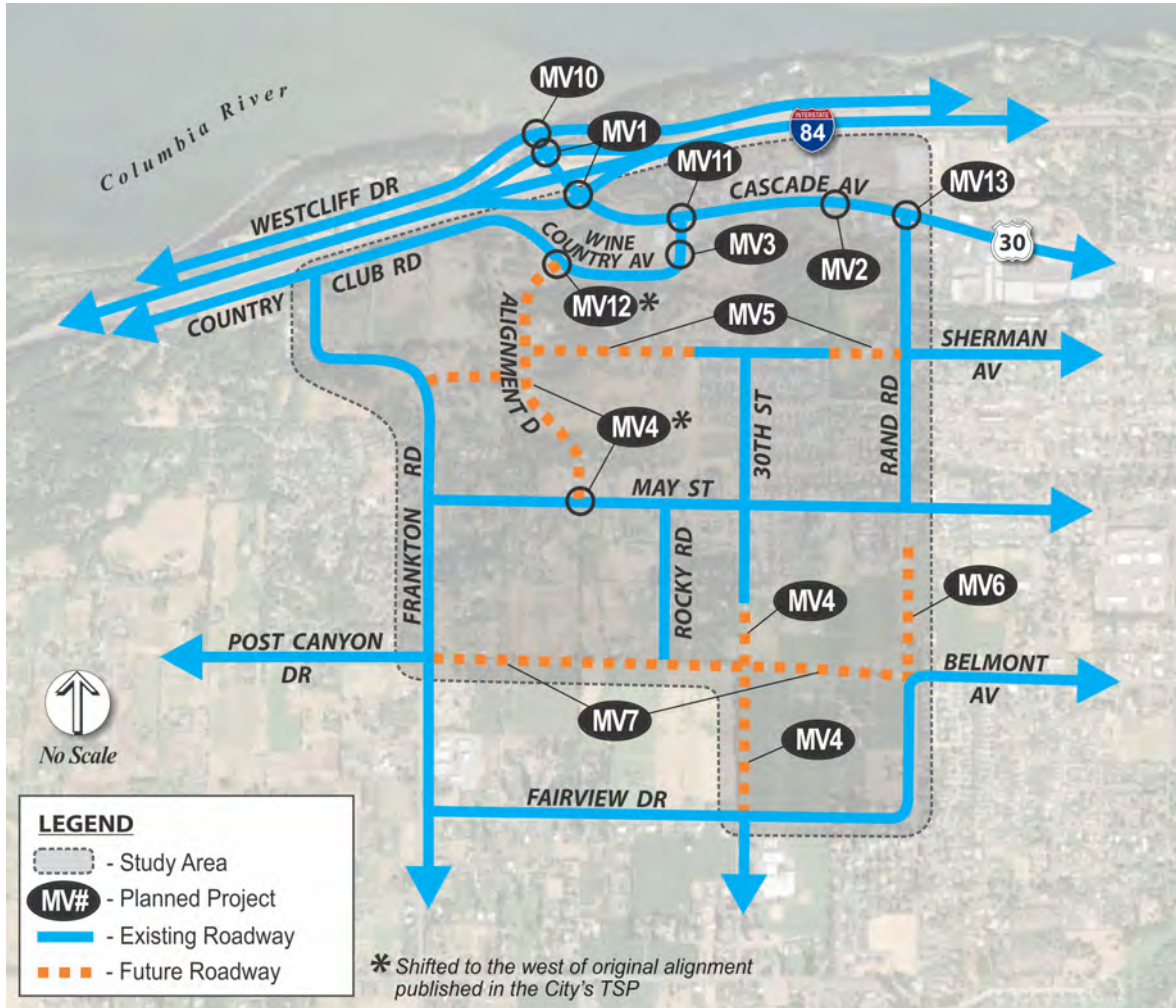
Two alternative alignments of the Mt. Adams Avenue extension, including Alignment D, were proposed (refer to the Alternatives Analysis Report<sup>4</sup>) instead of the alignment identified in the City’s TSP. Under the 2040 Strong Scenario Alternative land use scenario, the two alignments would be functionally equivalent from a transportation standpoint if appropriate intersection improvements are included at key locations where the alignments differ.

To move forward with the transportation analysis, the alignment shown in Figure 3 (Alignment D) was assumed to be in place as part of the Strong Scenario. To be clear, this is not a final decision between the two proposed alignments. There are other factors including construction costs, grades, and other utilities that will be used to evaluate the two alignments before a decision is made.

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<sup>4</sup> Hood River Westside Area Concept Plan Alternatives Analysis Report DRAFT, January 2017.





**Figure 3: 2040 Strong Scenario Alternative Transportation Network Assumptions**

### Consistency with the Transportation Planning Rule

According to the TPR, in determining whether a proposed land use regulation amendment has a significant effect on the existing or planned transportation system, the evaluation must rely only on existing transportation facilities and planned facilities that are either funded or for which the state/local agency provides a written statement that the facility is reasonably likely to be funded by the end of the planning period.<sup>5</sup> Table 1 describes the funding status of the projects from the 2011 City of Hood River TSP that are used as part of the Base Alternative. For this analysis, projects that were included in the TSP Financially Constrained Plan are assumed reasonably likely to be funded. The Financially Constrained Plan includes select TSP projects that were assumed to be fundable through 2031 considering funding projections.

**Table 1: Funding Status of Planned Improvements**

Project ID	Name/Location	Funding Status
MV1	I-84 Exit 62 Interchange	Not funded
MV2	Cascade Avenue (I-84 Exit 62 Interchange to Rand Road)	Not funded
MV3	Country Club Road Realignment/Mt. Adams Avenue	TSP Financially Constrained Plan
MV4	Mt. Adams Avenue (Country Club to Fairview Drive)	TSP Financially Constrained Plan – Segment from Country Club Road to May Street only
MV5	Sherman Avenue (Rand Road to Mt. Adams Avenue)	Not funded
MV6	Rand Road (May Street to Belmont Avenue)	Not funded
MV7	Belmont Avenue (Rand Road to Frankton Road)	Not funded
MV10	Cascade Avenue/Westcliff Drive	Not funded
MV11	Mt. Adams Avenue/Cascade Avenue	TSP Financially Constrained Plan
MV12	Mt. Adams Avenue/Country Club Road	TSP Financially Constrained Plan
MV13	Rand Road/Cascade Avenue	Funded

<sup>5</sup> OAR 660-012-0060(4)

As shown, not all improvements included as part of the Base Alternative are considered reasonably likely to be funded. However, projects that include new road extensions, such as MV4 south of May Street, MV5, MV6, and MV7, will largely be constructed by developers and will be essential for providing basic access to future development. These projects were assumed to be in place by 2040 because they would be needed to provide basic access and circulation needs.

The projects that would improve the I-84 Exit 62 interchange area and the segment of Cascade Avenue between I-84 and Rand Road, including MV1, MV2, and MV10, are not considered reasonably likely to be funded. However, without these improvements by 2040 the transportation system would not function adequately during the peak period and the congestion would be so severe that the impacts of the proposed land use action could not be measured. Therefore, these improvements were also included as part of the Base and Strong Scenario Alternatives.

While the Base Alternative includes many planned improvements that are not currently anticipated to be funded by 2040, these improvements will be essential for providing a functioning transportation system and meaningful analysis of land use action impacts. To maintain consistency with the TPR, the City will need to amend the 2011 TSP to include any new projects determined to be needed along with a funding plan to support timely implementation.

## Future Traffic Volume Development

To determine future year intersection traffic operations, year 2040 motor vehicle traffic volumes were forecasted at the study intersections. These volumes were forecasted by applying each alternative's land use and transportation network assumptions to the Hood River Travel Forecast Tool created for network analysis when the 2011 TSP was developed. Future volumes at the study intersections are provided in Appendix A.

## Future Traffic Operations

Future intersection operations analysis was performed for the 12 study area intersections to identify potential transportation impacts from the proposed rezones associated with the Strong Scenario Alternative. Intersections are the focus of the analysis because they are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is nearly always diminished in their vicinity. Included are descriptions of the intersection performance measures, jurisdictional operational standards, and future traffic operational analysis.

### Intersection Performance Measures

Level of service (LOS) ratings and volume-to-capacity (v/c) ratios are two commonly used

performance measures that provide a good picture of intersection operations. In addition, they are often incorporated into agency mobility standards.

- Level of service (LOS): A “report card” rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.
- Volume-to-capacity (v/c) ratio: A decimal representation (typically between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 0.95, congestion increases and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

### Jurisdictional Operating Standards

All study intersections are subject to the adopted operating standards of either the City of Hood River or ODOT. Having all intersections meet those standards is desired, but for TPR compliance they can fail to meet operating standards if the proposed land use action does not make conditions worse than they were otherwise. In this case, the 2040 Base Alternative serves as the baseline benchmark for operational performance.

Intersection performance measures used for operating standards vary by roadway jurisdiction. The study intersections under ODOT jurisdiction must comply with the v/c ratio targets in the Oregon Highway Plan (OHP), which specifies a v/c ratio target of 0.95 or less for the study intersections along Cascade Avenue.<sup>6</sup> The OHP specifies a more restrictive v/c target of 0.85 or less for ramp terminals.<sup>7</sup>

The study intersections under City of Hood River jurisdiction must comply with the LOS targets in the City’s TSP, which requires a LOS D or better for city-owned streets.<sup>8</sup>

### Intersection Operations

The future traffic operations at the study intersections were determined for the weekday p.m. peak hour based on the Synchro<sup>9</sup> software analysis using 2000 Highway Capacity Manual

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<sup>6</sup> Table 7, Oregon Highway Plan, Oregon Department of Transportation, December 2011. Based on a District Highway, Non-MPO Outside of STAs where non-freeway posted speed  $\leq$  35 mph.

<sup>7</sup> Oregon Highway Plan, Oregon Department of Transportation, December 2011, page 76.

<sup>8</sup> City of Hood River Transportation System Plan, October 2011.

methodology<sup>9</sup> for signalized intersections and 2010 Highway Capacity Manual methodology<sup>10</sup> for unsignalized intersections. The level of service (LOS) and volume to capacity (v/c) ratio of each study intersection are listed in Table 2. Detailed intersection analysis worksheets are included in Appendix B.

As shown, two study intersections, Rand Road/27th Street/May Street and Cascade Avenue/Mt. Adams Avenue do not meet operating standards for the weekday p.m. peak hour under either alternative. From a TPR perspective, the Strong Scenario Alternative does not have a significant effect because it does not make the already failing conditions worse.

The City's TSP does not identify any improvements for the intersection of Rand Road/27th Street/May Street. If a traffic signal were constructed, operating conditions could be improved to a LOS B, which would meet adopted standards. Alternatively, the City could consider constructing a mini-roundabout at this location to fit within available right-of-way at a significantly lower cost.

The intersection of Cascade Avenue/Mt. Adams Avenue is assumed to be significantly improved with additional lanes and a traffic signal under both Base and Strong Scenario Alternative conditions. Further widening of Cascade Avenue or Mt. Adams Avenue is not recommended as it would have significant impacts to adjacent properties and pedestrian and bicycle safety. Therefore, it may be appropriate to consider alternative mobility targets in combination with transportation system and demand management strategies. By adopting an alternative mobility target, the City of Hood River and ODOT would be accepting higher levels of congestion in exchange for fewer negative impacts on pedestrian/bicycle travel and surrounding properties.

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<sup>9</sup> *2000 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2000.

<sup>10</sup> *2010 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2010.



**Table 2: Future Study Intersection Operations (P.M. Peak Hour)**

Intersection		Operating Standard	2040 Base Alternative			2040 Strong Scenario Alternative		
			LOS	Delay (sec)	v/c	LOS	Delay (sec)	v/c
1	Cascade Avenue/Westcliff Drive	0.95 v/c	C	21.7	0.14	C	21.3	0.12
2	Cascade Avenue/ I-84 Westbound Ramps	0.85 v/c	C	26.4	0.69	C	26.1	0.74
3	Cascade Avenue/ I-84 Eastbound Ramps	0.85 v/c	D	52.9	0.71	D	53.7	0.75
4	Cascade Avenue/Mt. Adams Avenue	0.95 v/c	C	34.8	<b>1.06</b>	C	28.2	<b>1.05</b>
5	Cascade Avenue/Rand Road	0.95 v/c	C	23.7	0.66	C	22.8	0.74
6	Country Club Road/Frankton Road	D	A/B	13.6	0.35	A/B	13.8	0.42
7	Frankton Road/May Street	D	A/C	16.3	0.39	A/C	20.8	0.48
8	May Street/30 <sup>th</sup> Street	D	C	27.6	0.58	A/C	17.6	0.28
9	Rand Road/27 <sup>th</sup> Street/May Street	D	<b>A/F</b>	>80	>1.0	<b>A/F</b>	>80	>1.0
10	Frankton Road/Post Canyon Road/Belmont Avenue	D	A/C	15.9	0.19	A/C	24.5	0.29
11	Belmont Avenue/30 <sup>th</sup> Street	D	A/D	27.6	0.12	A/D	30.1	0.28
12	Belmont Avenue/27 <sup>th</sup> Street	D	A/B	14.2	0.18	A/B	14.7	0.15
-	Alignment D/May Street	D	-	-	-	C	29.8	0.71
<p><b>Bolded Red and Shaded</b> values do not meet operating standards.                      Two-Way Stop Controlled intersections:                      LOS = Level of Service of Major Street/Minor Street (i.e., A/F)                      V/C = Volume-to-Capacity Ratio of Worst Movement                      Delay = Seconds of Delay of Worst Movement</p>								

### Interchange Ramp Queues

In addition to intersection operations, projected vehicle queues on the I-84 Exit 62 off-ramps were also compared between alternatives to identify potential safety issues. Safety concerns arise when ramp queues exceed the provided storage area and spill back into the portion of the

ramp needed to slow to a stop from exiting freeway speeds. Under extreme conditions, ramp queues could extend back into the I-84 mainline itself. The result is an increased risk for high-speed rear-end collisions.

SimTraffic modeling software was used to estimate the 95th percentile vehicle queues for the I-84 Exit 62 westbound and eastbound off-ramps. This analysis estimates the queue length that would not be exceeded in 95 percent of the queues formed during the peak hour. Table 3 identifies the 95th percentile queue lengths for the westbound and eastbound ramps at the I-84 Exit 62 interchange. Detailed queuing results are also included in Appendix C.

**Table 3: 2040 P.M. Peak Hour Motor Vehicle 95th Percentile Queuing**

Intersection	Movement	95 <sup>th</sup> Percentile Vehicle Queue Length (ft.)	
		2040 Base Alternative	2040 Strong Scenario Alternative
2 Cascade Avenue/ I-84 Westbound Ramps	Left	300	320
	Through/Left	440	640
	Right	120	180
3 Cascade Avenue/ I-84 Eastbound Ramps	Through/Left	320	140
	Right	320	300

As shown, the eastbound off-ramp queues improve with the Strong Scenario Alternative land use scenario in place. However, the westbound off-ramp queues get worse, increasing from a projected maximum of 440 feet to 640 feet.

The Exit 62 interchange is assumed to be completely reconstructed in either alternative. There will be an opportunity to design the ramp and queue storage lengths as needed during project development. Therefore, it is reasonable to assume that the longer queues associated with the Strong Scenario Alternative land use scenario can be accommodated.

### Summary of Key Findings & Recommendations

The study area intersections of Rand Road/27th Street/May Street and Cascade Avenue/Mt. Adams Avenue do not meet operating standards for the weekday p.m. peak hour under either alternative. From a TPR perspective, the Strong Scenario Alternative does not have a significant effect because it does not make the already failing conditions worse.

As the City’s TSP is amended to incorporate the transportation network assumptions associated with the Strong Scenario Alternative, it is recommended that the following new improvements be included:

- Rand Road/27th Street/May Street Intersection – construct traffic signal or mini-roundabout
- Cascade Avenue/Mt. Adams Avenue Intersection – Discuss the opportunity to adopt an alternative mobility target with ODOT in combination with transportation system and demand management strategies to reduce auto trips through this area during the weekday p.m. peak hour. By adopting an alternative mobility target, the City of Hood River and ODOT would be accepting higher levels of congestion in exchange for fewer negative impacts on pedestrian/bicycle travel and surrounding properties.

If the Mt. Adams Avenue alignment further to the west (Alignment D) is selected, additional refinements include:

- May Street/30<sup>th</sup> Street Intersection – remove project to construct a traffic signal at this intersection
- May Street/Alignment D – construct a traffic signal or roundabout
- The intersection of Wine Country Avenue with Alignment D should be realigned so the west approach of Wine Country Avenue “T’s” into Alignment D, allowing Alignment D and the east approach of Wine Country Avenue to be the through movements. The intersection should be constructed to include:
  - Dual eastbound left turn lanes and an eastbound right turn lane from Wine Country Avenue
  - A northbound left turn lane, a northbound through lane, a southbound through lane, and southbound right turn lane on the Alignment D approaches

This alignment change would require regional truck traffic using Country Club Road to turn from one approach of Wine Country Avenue to the other, but should not significantly impact the ability of trucks to travel through the area.

- The segment of Wine Country Avenue between Alignment D and Mt. Adams Avenue would need to be widened to include two westbound lanes and two eastbound lanes (the second eastbound lane could be merged into one half way to Mt. Adams Avenue)
- Sherman Avenue Extension – Extend Sherman Avenue from Rand Road to Alignment D and designate as a Collector. Construct a Neighborhood Collector street between Alignment D and Frankton Road to the south of the Sherman Avenue alignment.
- Mt. Adams Avenue/Country Club Road – remove project (MV12) to construct a traffic signal at this location

In addition to the new improvements, a funding plan will be required to support implementation by 2040.

## APPENDIX D: ROUNDABOUT ANALYSIS



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## MEMORANDUM

DATE: April 17, 2017

TO: Joe Dills and Andrew Parish, Angelo Planning Group

FROM: John Bosket and Jasmine Pahukula

SUBJECT: Hood River Westside Area Concept Plan – Task 5.1 Cascade Avenue/Mt. Adams Avenue Roundabout Evaluation

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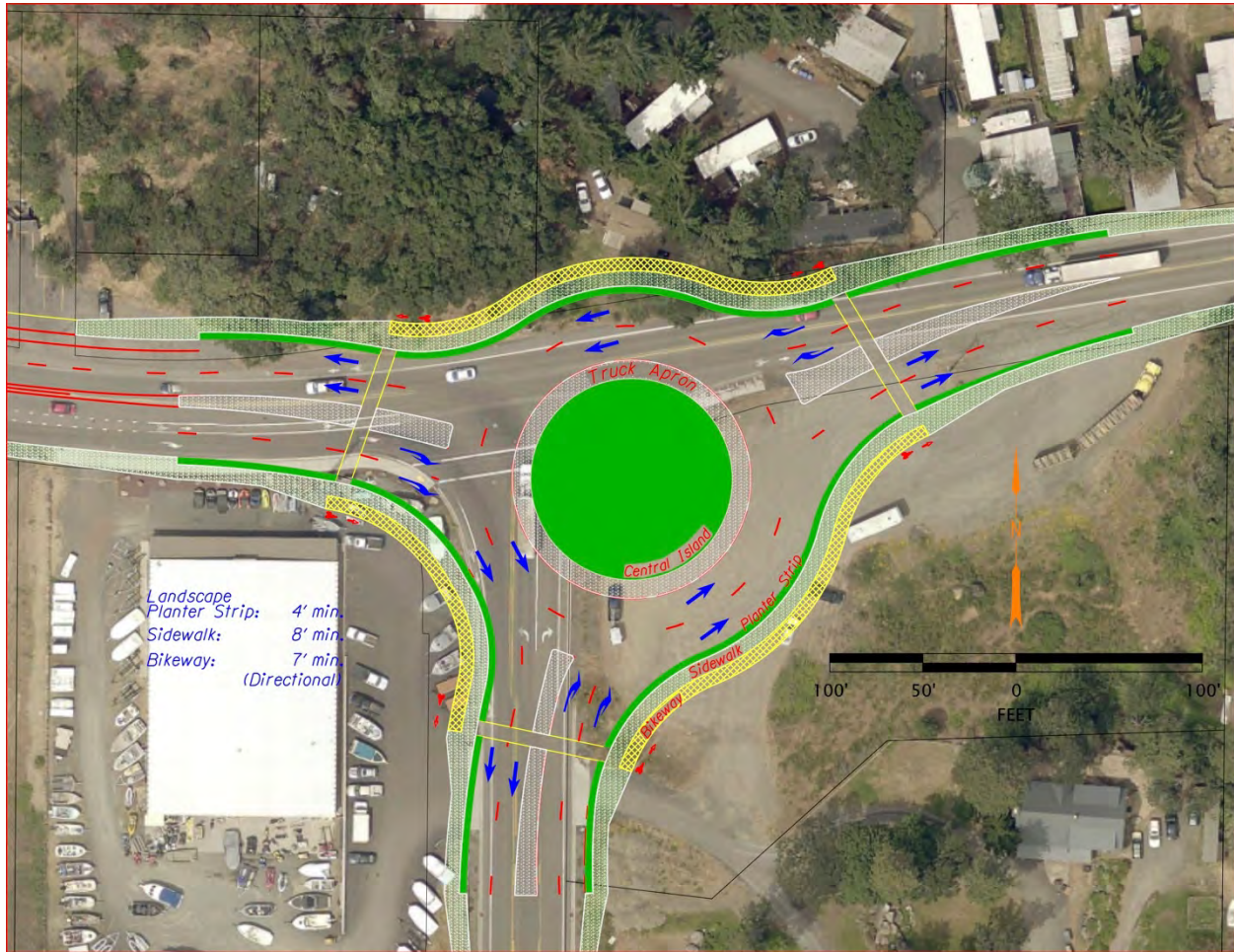
The City of Hood River’s Transportation System Plan (TSP) identifies improvements for the intersection on Cascade Avenue at Mt. Adams Avenue to provide sufficient capacity to accommodate future growth in auto trips. Some of these improvements have been made already. Remaining improvements include:

- Construct a second northbound left turn lane from Mt. Adams Avenue
- Construct a westbound left turn lane from Cascade Avenue (Cascade Avenue would ultimately have a center turn lane extended to Rand Road)
- Construct a second westbound lane leaving the intersection and ending at the I-84 interchange
- Construct a traffic signal

Westside Area Concept Plan stakeholders have expressed interest in constructing a roundabout at this intersection instead of the planned improvements. The purpose of this memorandum is to provide a comparative evaluation of a roundabout alternative to the TSP planned improvements to facilitate further consideration of this proposal. This evaluation was performed using traffic volumes consistent with the 2040 “Strong” land use scenario.

To support this evaluation, ODOT has provided a concept drawing of a potential roundabout design for the intersection on Cascade Avenue at Mt. Adams Avenue. The concept drawing is shown in Figure 1 and will be used for this evaluation; however, much of this comparison remains generalized for “typical” roundabouts since the roundabout concept has not been developed in detail.





**Figure 1: Cascade Avenue/Mt. Adams Avenue Roundabout Concept Drawing**

This evaluation considers:

- A. Intersection Operations
- B. Truck Movements
- C. Safety
- D. Pedestrian and Bicycle Accommodations
- E. Urban Design Character
- F. Historic Columbia River Highway Compatibility
- G. Right-of-Way Needs
- H. Costs

## A. INTERSECTION OPERATIONS

This evaluation compares each intersection alternative’s ability to accommodate peak auto travel demands without incurring excessive delay. The results are compared between each treatment as well as to the mobility standards of ODOT and the City of Hood River, which require operation no worse than a v/c ratio of 0.80<sup>1</sup> or a level of service D, respectively.

Table 1 compares expected operations for each alternative.

**Table 1: Intersection Operations Comparison, Cascade Avenue at Mt. Adams Avenue (2040 Weekday P.M. Peak Hour)**

Intersection Alternative	Operating Standard	Intersection Operations		
		LOS	Delay (sec)	v/c
Signalized Alternative	0.80 v/c	C	28.2	<b>1.05</b>
Roundabout Alternative (designed as shown in Figure 1)	0.80 v/c	E	55.6	<b>1.23</b>
Roundabout Alternative (refined)	0.80 v/c	C	26.7	<b>0.90</b>

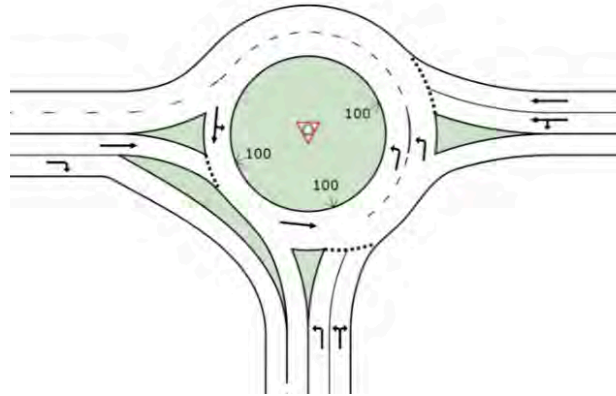
**Bolded Red and Shaded** values do not meet operating standards.

The roundabout alternative will not perform as efficiently as the traffic signal alternative if designed as drawn in Figure 1. However, with the refined configuration shown in Figure 2, the roundabout will operate significantly better than the traffic signal. Queue spillback to the I-84 interchange is not addressed with this analysis and should be evaluated if a roundabout alternative is chosen.

Note that with the refined configuration, the eastbound right turn lane is changed to a slip lane to maximize capacity for the very heavy right turn movement (a similar treatment is assumed for the traffic signal). Also, only one lane is required for traffic leaving the roundabout to go east, which will reduce costs and right-of-way needs.

<sup>1</sup> ODOT Mobility standard taken from the Highway Design Manual, Table 10-2. The Highway Design Manual standards are to be applied rather than the Oregon Highway Plan standards when considering acceptable operation of proposed improvements. The Oregon Highway Plan standard would require operation at a v/c ratio of 0.95 or better.

The construction of the second circulating lane is often deferred to a later phase when constructing multilane roundabouts. The second circulating lane serving the northbound left turn at the Cascade Avenue/Mt. Adams Avenue roundabout is estimated to be needed by the year 2020. This need will largely be driven by the rate of development in the Westside Area, but the analysis suggests that construction of the second lane should not be deferred.



**Figure 2: Refined Configuration of a Cascade Avenue/Mt. Adams Avenue Roundabout**

As an additional benefit not directly addressed by this memorandum, roundabouts are widely acknowledged for producing fewer emissions from auto traffic. This is due to the nature of roundabout operations where vehicles spend less time stopped and idling at the intersection.

## B. TRUCK MOVEMENTS

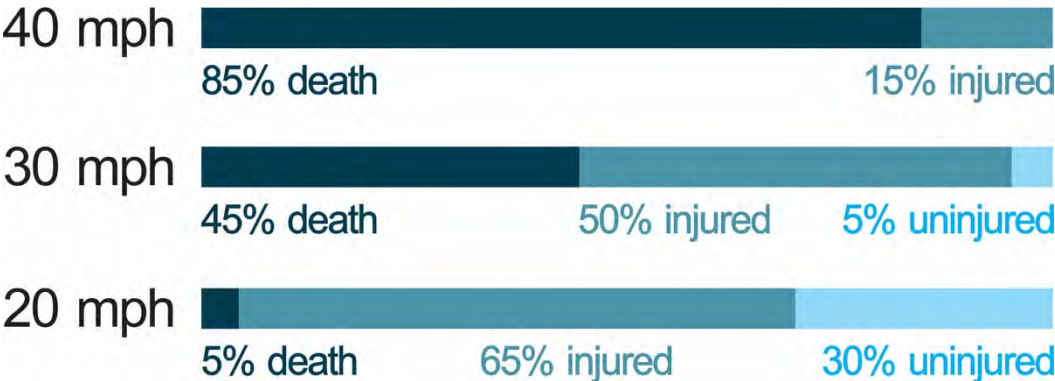
When considering a roundabout on the state highway system, the needs and concerns of stakeholders who move freight on Cascade Avenue are taken into account. Conversations about freight movement needs occur with the trucking industry through the ODOT Motor Carrier Division. To date minor coordination with the freight stakeholders group has occurred. Formal coordination will occur this spring if it appears there is growing community support and interests for a roundabout.

### C. SAFETY

Roundabouts are generally accepted to be safer designs than signalized intersections. In fact, the Federal Highway Administration has included roundabouts on a list of “Proven Safety Countermeasures.”<sup>2</sup>

Compared to signalized intersections, roundabouts commonly experience fewer overall crashes and fewer crashes that result in injuries. Research has shown that intersections converted from signalized control to two-lane roundabouts experienced on average a 19% reduction in all crashes and a 71% reduction in crashes resulting in injuries.<sup>3</sup>

The primary reasons for this are the lower vehicle speeds and elimination of angle conflicts. For reference, two-lane roundabout entry speeds are typically around 25 mph, while the posted speed of Cascade Avenue is currently 35 mph. Additional research has shown that vehicle speeds at impact significantly affect whether a pedestrian will survive a collision. The difference between an impact at 25 mph and 35 mph could change the probability of survival by about 40%.



**Figure 2: Pedestrian Injuries at Impact Speeds<sup>4</sup>**

Additional factors affecting safety for pedestrians and bicyclists are described in the following section.

<sup>2</sup> <https://safety.fhwa.dot.gov/provencountermeasures/>

<sup>3</sup> Safety Effectiveness of Converting Signalized Intersections to Roundabouts, Gross et al., January 2012.

<sup>4</sup> UK DOT, 1987

## D. PEDESTRIAN AND BICYCLE ACCOMMODATIONS

The following assumptions are applied to the comparison of the general quality and safety of pedestrian and bicycle accommodations.

Signalized Intersection:

- The north-south crosswalk on the west approach of Cascade Avenue would be closed to minimize auto delay and avoid dangerous auto-pedestrian conflicts.
- The eastbound right turn lane would be channelized to run under yield control and would not be controlled by the traffic signal.

Roundabout:

- Bicycle lanes would end at roundabout entrances and bicyclists would be directed to pass through the intersection on a shared-use path around the perimeter.
- Similar to the traffic signal design, the eastbound right turn would be channelized to run under yield control.

### Convenience

Pedestrians are accommodated by crossings around the perimeter of the roundabout, which creates out-of-direction travel for some movements and could be viewed as an inconvenience. There would be less out-of-direction travel under the signalized design, however, the north-south crosswalk on the west approach of Cascade Avenue would be closed.

The complexity of vehicle interactions within a roundabout leaves a bicyclist vulnerable, and for this reason, bike lanes within the circulatory roadway should never be used. On multilane roundabouts, a bicycle path separate and distinct from the circulatory roadway is preferable, such as a shared bicycle-pedestrian path of sufficient width and appropriately marked to accommodate both types of users around the perimeter of the roundabout (as drawn in Figure 1). While this will likely be more comfortable for the casual bicyclist, the experienced commuter bicyclist will be significantly slowed down by having to cross as a pedestrian at each approach crossing and may choose to continue to traverse a multilane roundabout as a vehicle.

### Safety

By providing space to pause on the splitter island, pedestrians can consider one direction of conflicting traffic at a time, which simplifies the task of crossing the street. Crosswalks are set back from the yield line by one or more vehicle lengths to separate vehicle-vehicle and vehicle-pedestrian conflict points.

Elderly pedestrians, children, and the disabled find it more difficult to cross unprotected road crossings. These types of pedestrians generally prefer larger gaps in the traffic stream, and



walk at slower speeds than other pedestrians. Multilane roadways entering and exiting double-lane roundabouts require additional skills to cross, since pedestrians need assurance that they have been seen by drivers in each lane they are crossing.

To address the complexity of crossing the multilane roundabout approaches, it is recommended that one of the following treatments be considered should this alternative advance to design.

- a. High Intensity Activated Cross Walk (aka, HAWK);
- b. Rectangular Rapid Flashing Beacon (RRFB); or
- c. Full signalization

Signalized intersections offer positive guidance to pedestrians by providing visual and occasionally audible pedestrian signal indications. Therefore, the decision process for pedestrians requires less judgment at signalized intersections than at roundabouts, particularly for visually impaired and elderly pedestrians. However, pedestrians are still vulnerable at signalized intersections to right-turn and left-turn movements unprotected by a green arrow. In addition, high-speed collisions are still possible if a vehicle runs through a red indication. In this respect, the roundabout provides a speed-constrained environment for through traffic.

## E. URBAN DESIGN CHARACTER

A roundabout at the western end of Cascade Avenue would function as a western gateway into the City of Hood River. Roundabouts typically include natural materials, art or a combination of the two to reflect the city or place. Roundabouts are unique traffic control features due to their size, intended separated bike and pedestrian facilities and rare use. For these reasons the Cascade Avenue/Mt. Adams Avenue roundabout would be a unique place-making feature and place for art.

The larger footprint of a roundabout, and a double-lane roundabout in particular, has a grander scale than a signalized intersection. While this larger scale is not in keeping with the Hood River downtown or historic character of the highway, it is in keeping with the larger landscape of the Columbia Gorge. It is likely that the existing rock wall on the north side of Cascade Avenue would remain but be altered with a roundabout due to the land area needed. In contrast, a signalized intersection is a traditional treatment that would translate less to users as a gateway.

A signalized intersection could contribute to a positive urban design character if future development and redevelopment consists of buildings moved up to the street. This treatment of buildings with wide, decorative sidewalks creates a more enclosed street environment and pedestrian scale. The addition of wide sidewalks with either a landscape or furniture zone between the street and sidewalk would reinforce the pedestrian nature of the intersection. This treatment is more consistent with the historic highway and the City's historic downtown.

## F. HISTORIC COLUMBIA RIVER HIGHWAY COMPATIBILITY

Cascade Avenue is part of the Historic Columbia River Highway. The Historic Columbia River Highway Advisory Committee was informed at their March 2017 meeting that a technical analysis to compare a roundabout and signalized intersection for the Cascade Avenue at Mt. Adams Avenue intersection was being conducted. Formal coordination with the advisory committee will occur this spring if it appears there is growing community support for a roundabout. Should consensus between the partner agencies exist for a roundabout, the historic highway Programmatic Agreement involving the Forest Service and other partner agencies would need to be amended to reflect a roundabout.

The Interstate 84 Exit 62 Interchange Area Management Plan governs the access along Cascade Avenue between I-84 and Rand Road. It would need to be reviewed to determine if a roundabout is consistent with the plan and if not, the access management plan would need to be amended.

## G. RIGHT-OF-WAY NEEDS

The comparison of right-of-way needs between the alternatives must remain qualitative in nature because only concept drawings have been created at this time.

Right-of-way needs for roundabouts and traffic signals vary, but are generally comparable. Roundabouts tend to require more right-of-way around the immediate intersection, but less on the roadway approaches where a traffic signal would require additional turn lanes.

For the Cascade Avenue/Mt. Adams Avenue intersection, the roadway approaches will require a similar number of lanes for each alternative. Therefore, the areas needed to accommodate the circular roadway at the intersection and realign the roadways as they approach the roundabout would be the primary difference. While quantities are not available, it is assumed that the roundabout alternative would require more right-of-way.

## H. COSTS

This cost comparison considers construction costs as well as costs of ongoing maintenance and operations. Based on the concept drawings available, the following are order-of-magnitude estimates and should only be used for planning purposes.

The estimated planning-level costs to complete the signalized intersection alternative is between \$2 and \$3 million. The estimated cost to construct the roundabout is between \$5.5 and

\$6.5 million.

While roundabout construction costs would be about twice as much, the ongoing costs to operate and maintain the roundabout would be considerably less. Ongoing traffic signal costs for signal timing adjustments, power, and repairs can cost \$5,000 to \$10,000 per year.<sup>5</sup> Roundabouts, however, can have higher landscape maintenance costs, depending on the degree of landscaping provided on the central island, splitter islands, and perimeter. Illumination costs for roundabouts and signalized intersections are similar.

Aside from these costs, the societal cost savings from fewer crashes, and especially fewer injury crashes, can be substantial. Considering the costs of minor to moderate injury crashes range from \$70,000 to \$100,000 and the costs of crashes resulting in serious injuries and fatalities range from \$1 to \$3 million, a roundabout can more than pay for itself in just a short time.

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<sup>5</sup> WSDOT <https://www.wsdot.wa.gov/Safety/roundabouts/benefits.htm>



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## APPENDIX

A – Capacity Analysis Worksheets

Signalized Alternative



HCM Signalized Intersection Capacity Analysis  
3: Mt Adams Ave & Cascade Ave

2040 Strong Scenario Alternative  
PM Peak Hour

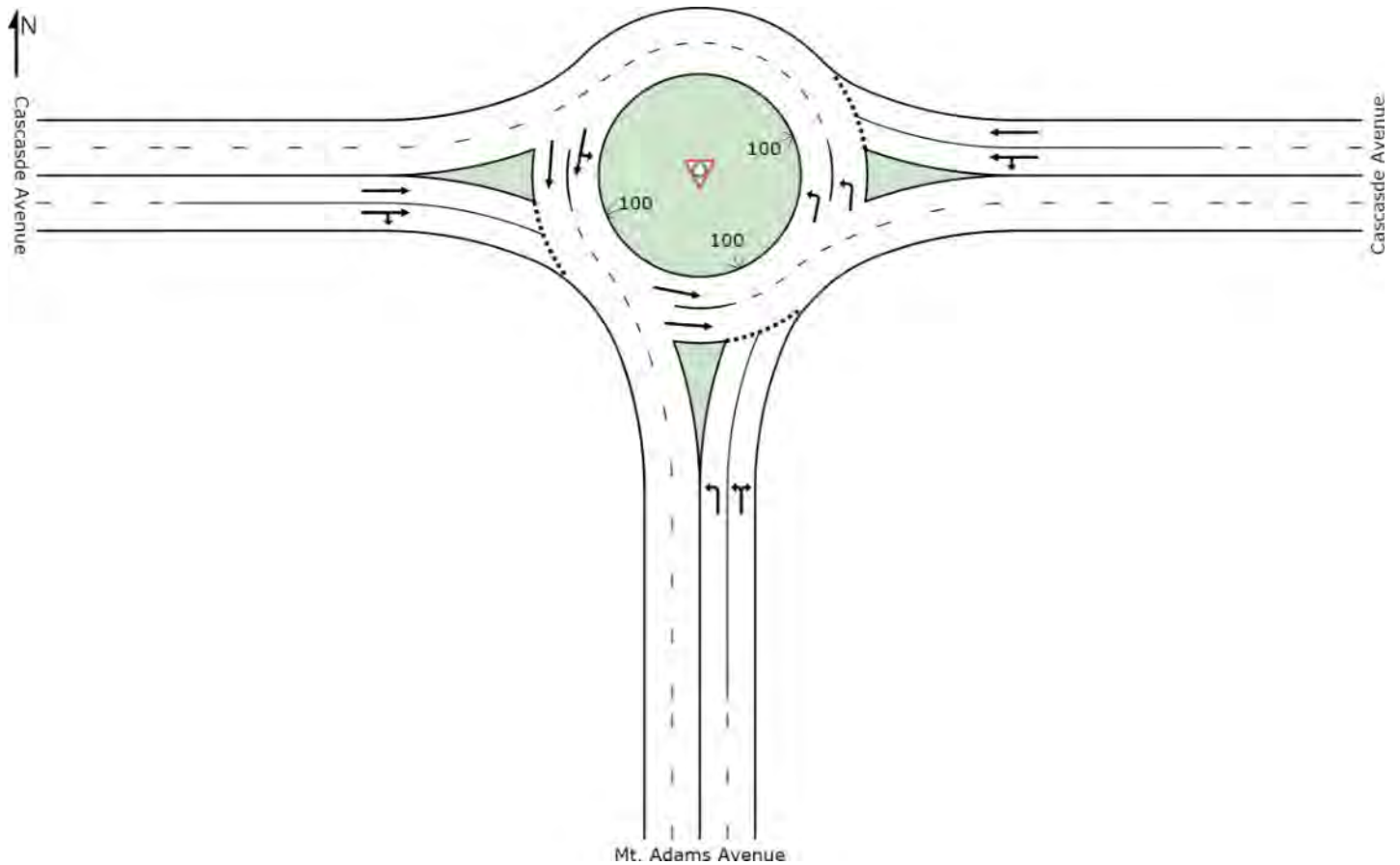
	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↖	↗
Traffic Volume (vph)	470	850	485	535	715	310
Future Volume (vph)	470	850	485	535	715	310
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frbp, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1699	1421	1614	1699	3162	1422
Flt Permitted	1.00	1.00	0.15	1.00	0.95	1.00
Satd. Flow (perm)	1699	1421	249	1699	3162	1422
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	522	944	539	594	794	344
RTOR Reduction (vph)	0	0	0	0	0	65
Lane Group Flow (vph)	522	944	539	594	794	279
Confl. Peds. (#/hr)		10	10			10
Confl. Bikes (#/hr)		5				5
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Turn Type	NA	Free	pm+pt	NA	Prot	pm+ov
Protected Phases	6		5	2	4	5
Permitted Phases		Free	2			4
Actuated Green, G (s)	31.0	90.0	59.0	59.0	23.0	47.0
Effective Green, g (s)	31.0	90.0	59.0	59.0	23.0	47.0
Actuated g/C Ratio	0.34	1.00	0.66	0.66	0.26	0.52
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	585	1421	527	1113	808	805
v/s Ratio Prot	0.31		c0.27	0.35	c0.25	0.09
v/s Ratio Perm		0.66	c0.40			0.10
v/c Ratio	0.89	0.66	1.02	0.53	0.98	0.35
Uniform Delay, d1	27.9	0.0	24.1	8.2	33.3	12.5
Progression Factor	1.04	1.00	1.28	1.03	0.81	0.36
Incremental Delay, d2	13.2	2.0	42.0	1.6	16.8	0.1
Delay (s)	42.2	2.0	72.8	10.1	43.7	4.7
Level of Service	D	A	E	B	D	A
Approach Delay (s)	16.3			39.9	31.9	
Approach LOS	B			D	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			28.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			1.05			
Actuated Cycle Length (s)			90.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			88.2%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

Roundabout Alternative (designed as shown in Figure 1)

# SITE LAYOUT

 Site: Mt. Adams Avenue/Cascade Avenue

Two-Lane  
Roundabout



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Organisation: DKS ASSOCIATES | Created: Monday, April 10, 2017 9:54:59 AM

Project: X:\Projects\2016\P16166-000 (Hood River Westside Concept Plan)\Work Tasks\Roundabout Analysis\Sidra\Mt. Adams Avenue & Cascade Avenue 2-lane.sip6

# INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

 Site: Mt. Adams Avenue/Cascade Avenue

Two-Lane  
Roundabout

Volume Display Method: Total and %

Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

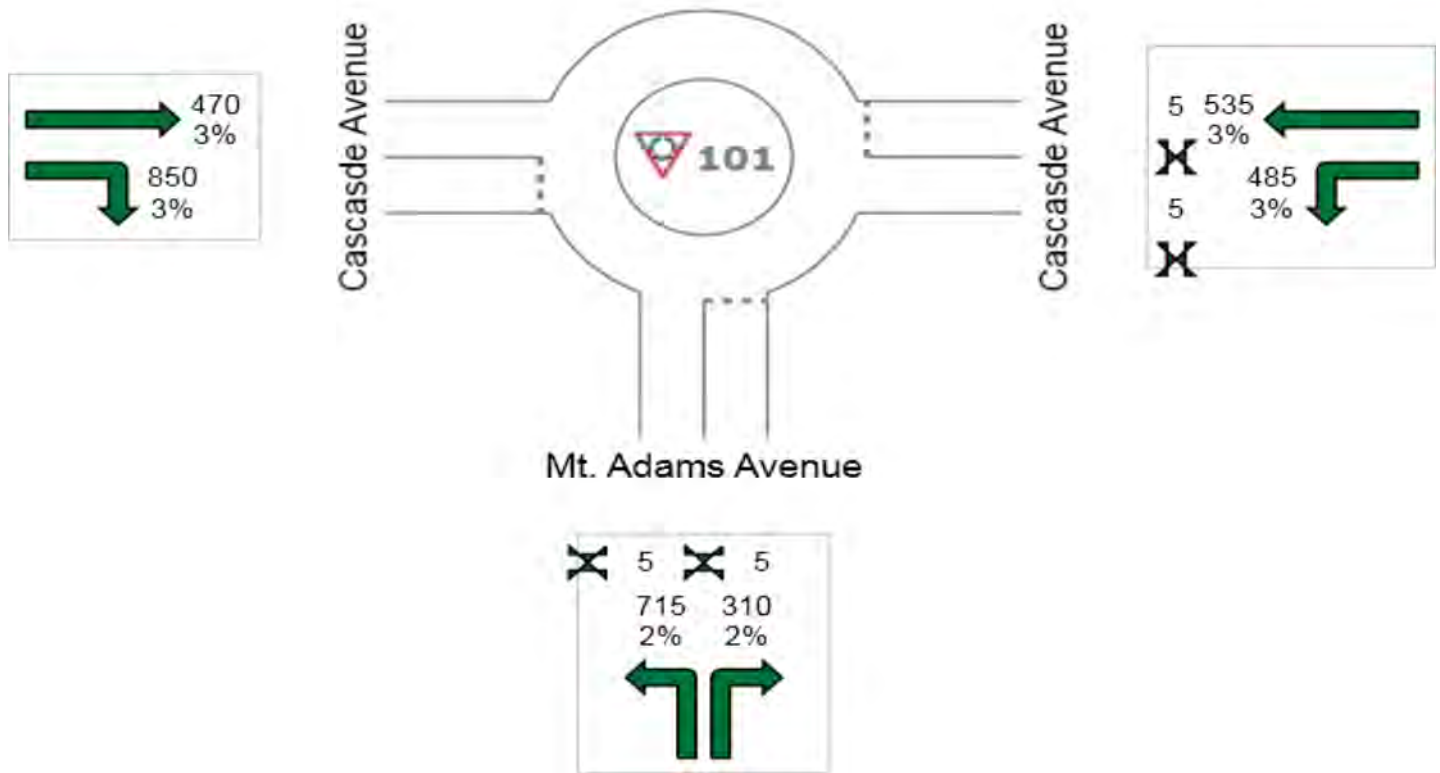
Total Intersection Volumes (veh)

All Movement Classes: 3365

Light Vehicles (LV): 3274

Heavy Vehicles (HV): 91

Pedestrians: 20



# INTERSECTION SUMMARY

 **Site: Mt. Adams Avenue/Cascade Avenue**

Two-Lane  
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	17.4 mph	17.4 mph
Travel Distance (Total)	2354.4 veh-mi/h	2825.2 pers-mi/h
Travel Time (Total)	135.2 veh-h/h	162.2 pers-h/h
Demand Flows (Total)	3658 veh/h	4389 pers/h
Percent Heavy Vehicles (Demand)	2.7 %	
Degree of Saturation	1.232	
Practical Spare Capacity	-31.0 %	
Effective Intersection Capacity	2970 veh/h	
Control Delay (Total)	56.50 veh-h/h	67.80 pers-h/h
Control Delay (Average)	55.6 sec	55.6 sec
Control Delay (Worst Lane)	135.2 sec	
Control Delay (Worst Movement)	135.2 sec	135.2 sec
Geometric Delay (Average)	0.0 sec	
Stop-Line Delay (Average)	55.6 sec	
Idling Time (Average)	38.6 sec	
Intersection Level of Service (LOS)	LOS E	
95% Back of Queue - Vehicles (Worst Lane)	66.6 veh	
95% Back of Queue - Distance (Worst Lane)	1705.1 ft	
Queue Storage Ratio (Worst Lane)	1.41	
Total Effective Stops	7129 veh/h	8554 pers/h
Effective Stop Rate	1.95 per veh	1.95 per pers
Proportion Queued	0.83	0.83
Performance Index	267.7	267.7
Cost (Total)	2223.80 \$/h	2223.80 \$/h
Fuel Consumption (Total)	127.8 gal/h	
Carbon Dioxide (Total)	1144.0 kg/h	
Hydrocarbons (Total)	0.105 kg/h	
Carbon Monoxide (Total)	1.051 kg/h	
NOx (Total)	1.544 kg/h	

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,755,652 veh/y	2,106,783 pers/y
Delay	27,119 veh-h/y	32,543 pers-h/y
Effective Stops	3,421,742 veh/y	4,106,091 pers/y
Travel Distance	1,130,096 veh-mi/y	1,356,116 pers-mi/y
Travel Time	64,897 veh-h/y	77,877 pers-h/y
Cost	1,067,425 \$/y	1,067,425 \$/y
Fuel Consumption	61,361 gal/y	
Carbon Dioxide	549,116 kg/y	
Hydrocarbons	50 kg/y	
Carbon Monoxide	504 kg/y	
NOx	741 kg/y	

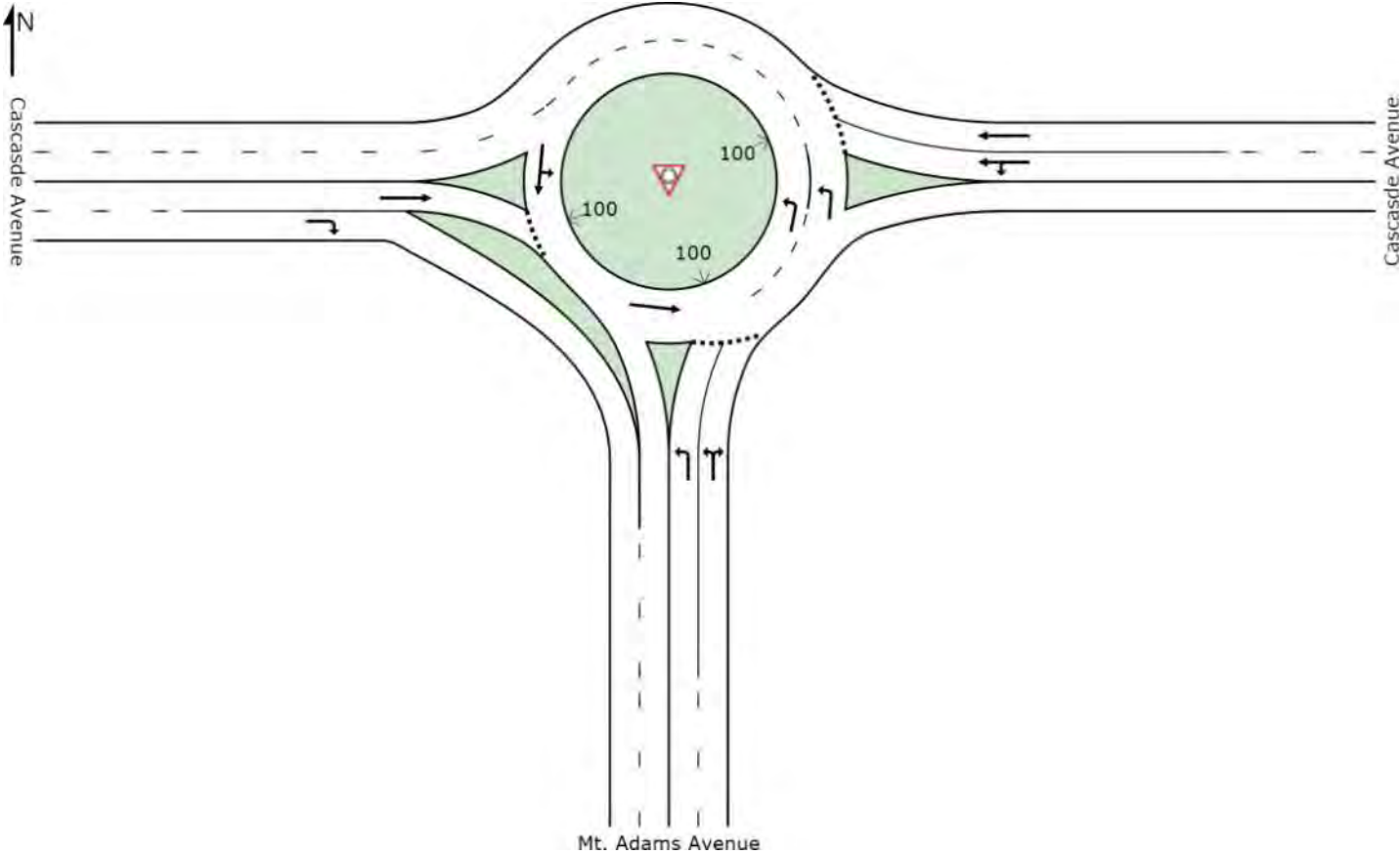


Roundabout Alternative (Refined)

# SITE LAYOUT

## Site: Mt. Adams Avenue/Cascade Avenue - Refined

Two-Lane  
Roundabout



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Organisation: DKS ASSOCIATES | Created: Monday, April 10, 2017 10:14:41 AM  
Project: X:\Projects\2016\P16166-000 (Hood River Westside Concept Plan)\Work Tasks\Roundabout Analysis\Sidra\Mt. Adams Avenue & Cascade Avenue 2-lane -improvements.sip6

# INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

 Site: Mt. Adams Avenue/Cascade Avenue - Refined

Two-Lane  
Roundabout

Volume Display Method: Total and %

Volumes are shown for Movement Class(es): All Classes and Heavy Vehicles

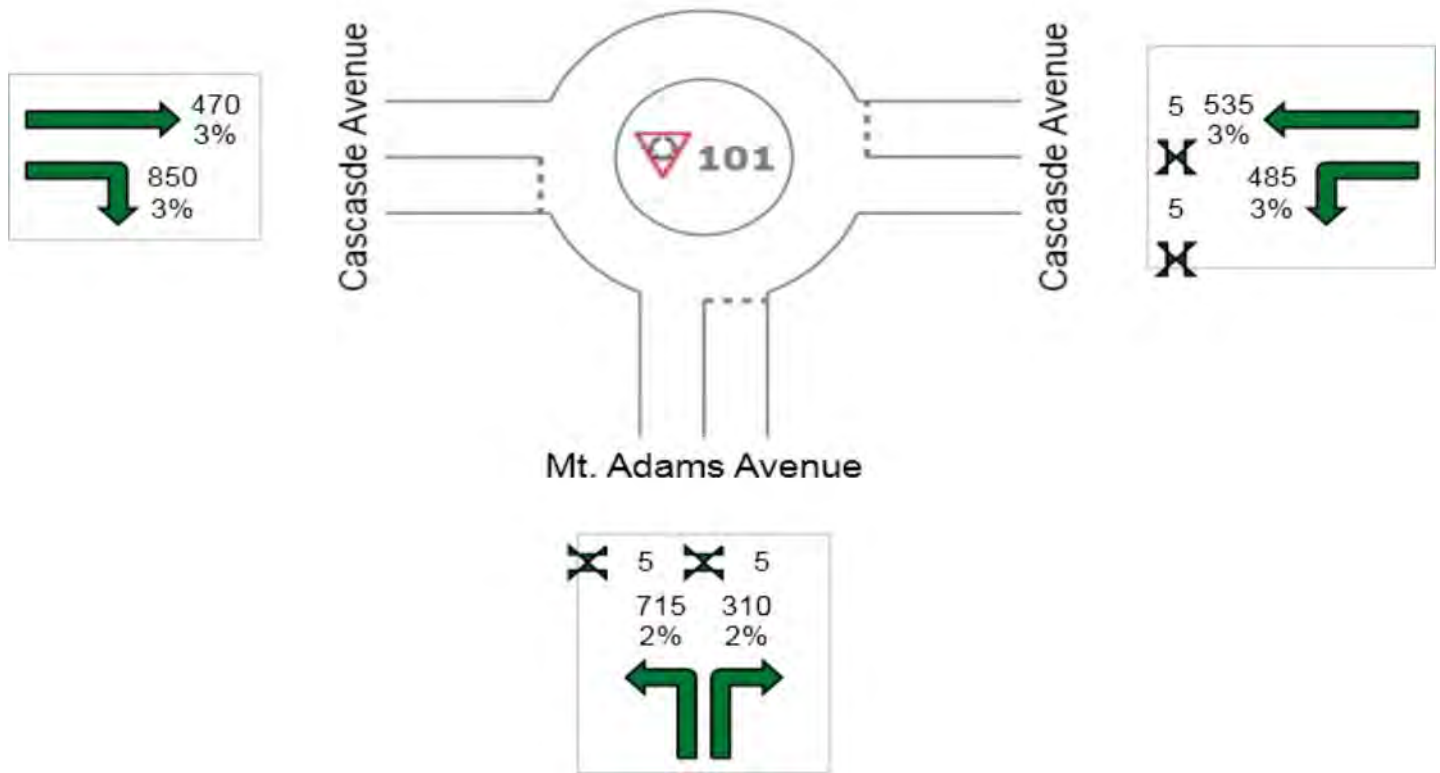
Total Intersection Volumes (veh)

All Movement Classes: 3365

Light Vehicles (LV): 3274

Heavy Vehicles (HV): 91

Pedestrians: 20



# INTERSECTION SUMMARY

 **Site: Mt. Adams Avenue/Cascade Avenue - Refined**

Two-Lane  
Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	21.4 mph	21.4 mph
Travel Distance (Total)	2354.3 veh-mi/h	2825.2 pers-mi/h
Travel Time (Total)	109.8 veh-h/h	131.8 pers-h/h
Demand Flows (Total)	3658 veh/h	4389 pers/h
Percent Heavy Vehicles (Demand)	2.7 %	
Degree of Saturation	0.899	
Practical Spare Capacity	-5.4 %	
Effective Intersection Capacity	4070 veh/h	
Control Delay (Total)	27.12 veh-h/h	32.55 pers-h/h
Control Delay (Average)	26.7 sec	26.7 sec
Control Delay (Worst Lane)	41.7 sec	
Control Delay (Worst Movement)	41.7 sec	41.7 sec
Geometric Delay (Average)	0.0 sec	
Stop-Line Delay (Average)	26.7 sec	
Idling Time (Average)	19.7 sec	
Intersection Level of Service (LOS)	LOS C	
95% Back of Queue - Vehicles (Worst Lane)	9.1 veh	
95% Back of Queue - Distance (Worst Lane)	232.2 ft	
Queue Storage Ratio (Worst Lane)	0.19	
Total Effective Stops	3455 veh/h	4146 pers/h
Effective Stop Rate	0.94 per veh	0.94 per pers
Proportion Queued	0.67	0.67
Performance Index	173.7	173.7
Cost (Total)	1676.47 \$/h	1676.47 \$/h
Fuel Consumption (Total)	105.6 gal/h	
Carbon Dioxide (Total)	945.6 kg/h	
Hydrocarbons (Total)	0.078 kg/h	
Carbon Monoxide (Total)	0.755 kg/h	
NOx (Total)	1.172 kg/h	

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,755,652 veh/y	2,106,783 pers/y
Delay	13,019 veh-h/y	15,623 pers-h/y
Effective Stops	1,658,218 veh/y	1,989,862 pers/y
Travel Distance	1,130,077 veh-mi/y	1,356,093 pers-mi/y
Travel Time	52,719 veh-h/y	63,263 pers-h/y
Cost	804,705 \$/y	804,705 \$/y
Fuel Consumption	50,688 gal/y	
Carbon Dioxide	453,870 kg/y	
Hydrocarbons	38 kg/y	
Carbon Monoxide	362 kg/y	
NOx	563 kg/y	

APPENDIX E: ONLINE OPEN HOUSE #2 SURVEY SUMMARY



# Memorandum



4/7/2017

**To:** Project Management Team  
**Cc:**  
**From:** Joe Dills, Andrew Parish, and Kyra Schneider, Angelo Planning Group  
**Re:** Summary of Online Open House #2

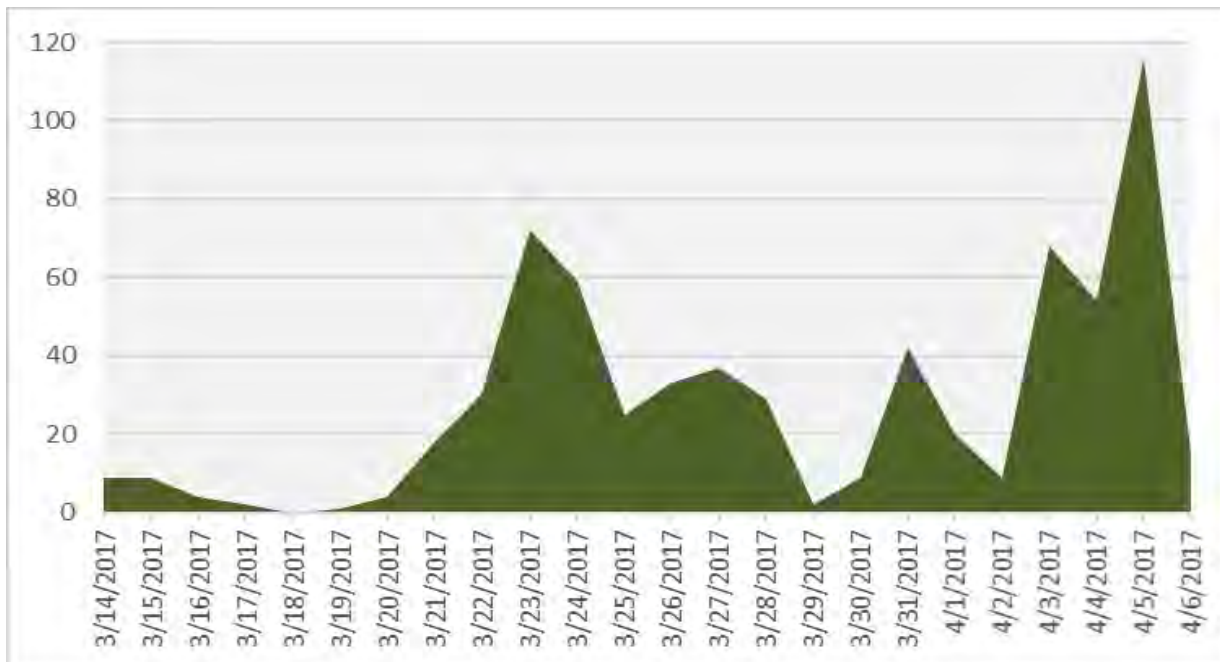
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## INTRODUCTION

This memorandum provides a summary of Online Open House #2 survey results. The survey was available through the Hood River Westside Area Concept Plan project website ([www.hrwestsideplan.com](http://www.hrwestsideplan.com)) from March 14, 2017 through April 5<sup>th</sup>, 2017.<sup>1</sup> The survey received 667 responses.

Figure 1 below shows the timeline of survey responses. The spikes in responses correspond generally to emails and postcard mailings conducted by City staff and the Hood River Valley Residents' Committee.

*Figure 1. Timeline of Survey Responses*



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<sup>1</sup> The original close date was March 28<sup>th</sup>, however several requests to keep the survey open were received from residents who were traveling for Spring Break during late March. The City opted to keep the survey open to allow additional opportunity for public input.

The overall goals of the Online Open House were to provide information on the Westside Area Plan process and gather input from the public on the following topics:

- Streets Framework
- Bicycle/Pedestrian Framework
- Parks/Open Space Framework
- Potential Locally-Serving Commercial Area
- Gateway Area
- Land Use Alternatives
- Affordable Housing
- The Mt. Adams Ave. Extension

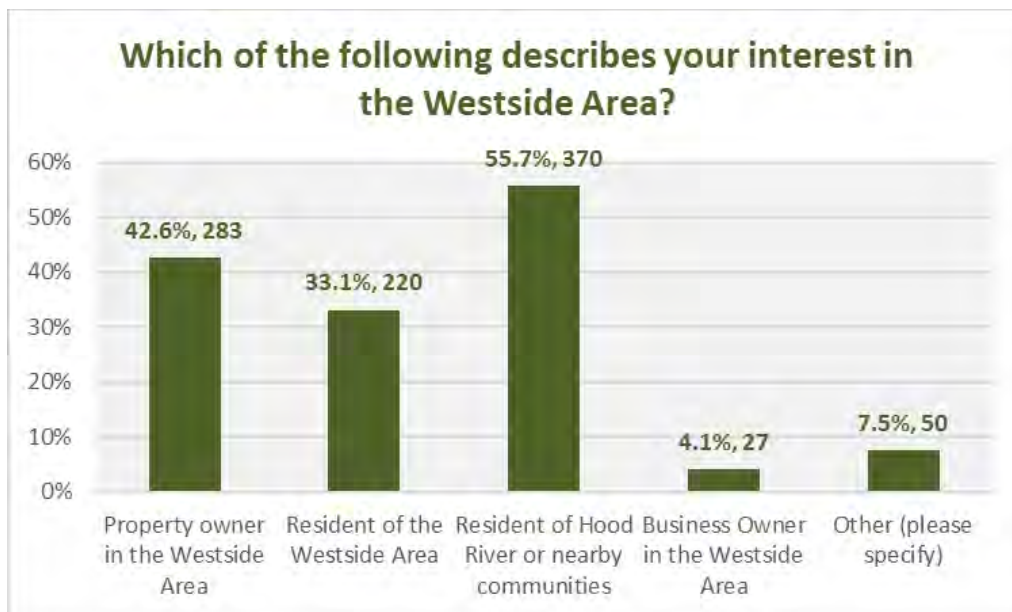
## PARTICIPANT INTEREST

Respondents checked one or more responses describing their interest in the Westside Area (Question 1). The majority (56%) of respondents said they were a resident of Hood River or nearby communities, 35% said they were residents of the Westside Area, and nearly 45% said they were property owners within the Westside Area (see

Figure 2 below). "Other" responses to Question 1 included:

- Concerned citizen
- Parent of children at Westside Elementary
- Prospective resident / business owner / property owner of the Westside Area
- Elected official
- Public employee representing an agency
- HOA president
- Advocate
- Frequent dog-walker in the Westside Area
- Attend church in the Westside Area
- Developer
- Realtor

Figure 2. Responses to Question 1

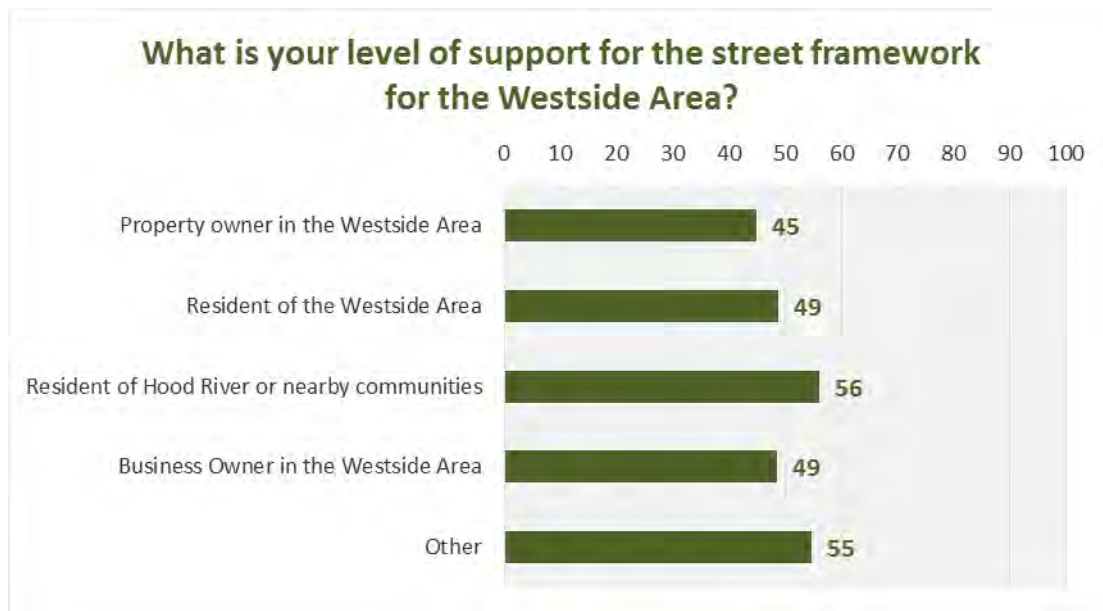


## STREETS FRAMEWORK

A brief overview of the potential street network was provided, along with a link to detailed information in a separate PDF. Respondents were asked their overall level of support for the street framework (Question 2), and were then invited to provide other concerns or recommendations for the overall street network (Question 3).

Overall, respondents had an average level of support of 51 out of 100 for the street framework. Figure 3 shows the responses to Question 2 broken down by respondents' answer to Question 1. Differences between these groups were fairly minor, but overall those who live or own property in the Westside Area had slightly less support for the streets framework than those who do not.

Figure 3. Responses to Question 2 by Respondents' Interest in Westside Area



Common themes in responses to Question 3 included:

- Concerns about traffic/safety on Cascade
- Concerns of safety for children in westside area
- Need for traffic signals at various high-capacity intersections in and around the Westside Area
- Concern about overall population growth
- Concern about steep slopes on roads
- Concern about impacts to the existing trail network
- Support for overall street connectivity within the area/connections to the rest of the city
- Concern about impacts to property values
- Concern about loss of trees/orchard/rural character
- Strong support for sidewalks and bike lanes
- A mix of support and opposition for the connection of Belmont to Post Canyon



Common themes in responses to Question 5 included:

- Strong support for more bike lanes, sidewalks, and trails overall
- Emphasis on the need for safety improvements to existing bicycle and pedestrian infrastructure
- Particular attention should be paid to safety near schools
- Desire for more physically separated or off-street biking and walking paths
- Concerns around speed limits and the enforcement of speeding
- Desire for bicycle and pedestrian infrastructure that connects to the waterfront

Figure 6. Word Cloud of Responses to Question 5



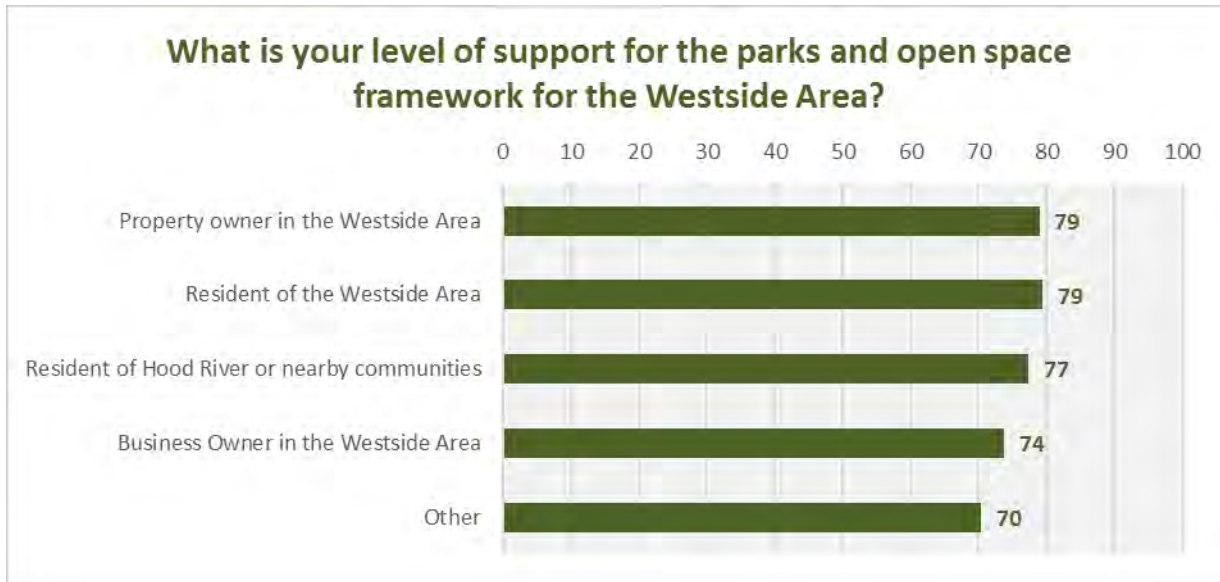
## PARKS AND OPEN SPACE FRAMEWORK

Information and a map of the proposed Parks and Open Space Framework was provided, and respondents were asked to rate their level of support for the framework (Question 6) and provide additional concerns and recommendations (Question 7).

Overall, respondents had an average level of support of 78 out of 100 for the Parks and Open Space framework. Figure 7 below shows the responses to Question 6 broken down by respondents' answer to Question 1. This generally high level of support mirrors comments received during the first online open house, where parks and open space were rated as a very important component of the concept plan.



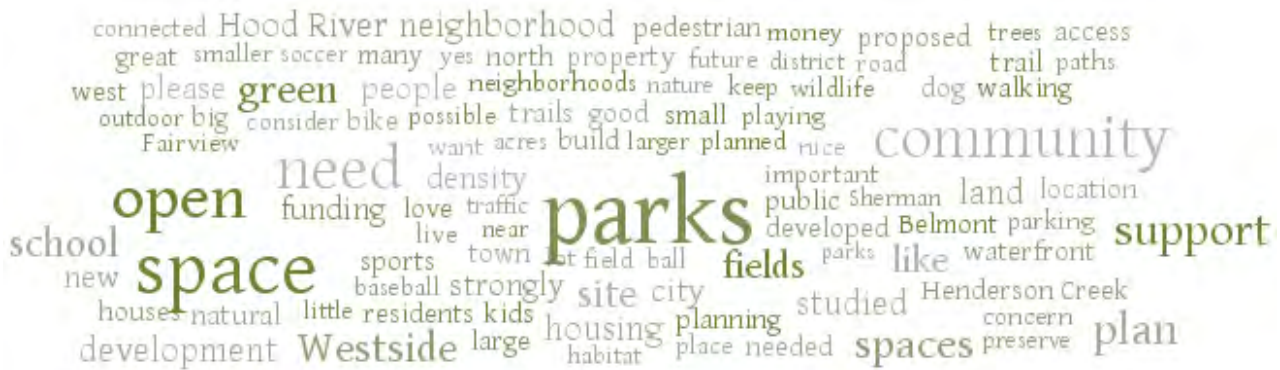
Figure 7. Responses to Question 6 by Respondents' Interest in Westside Area



Comments themes in Question 7 included:

- General support for the development of more parks in the Westside Area
- Emphasis on the need for turf and sports fields
- Concerns about the funding and implementation of the framework
- Concerns about park maintenance and safety
- Desire for a dog-friendly park
- Parks that incorporate a trail system
- Need for safe bicycle and pedestrian access to parks for both children and adults

Figure 8. Word Cloud of Responses to Question 7

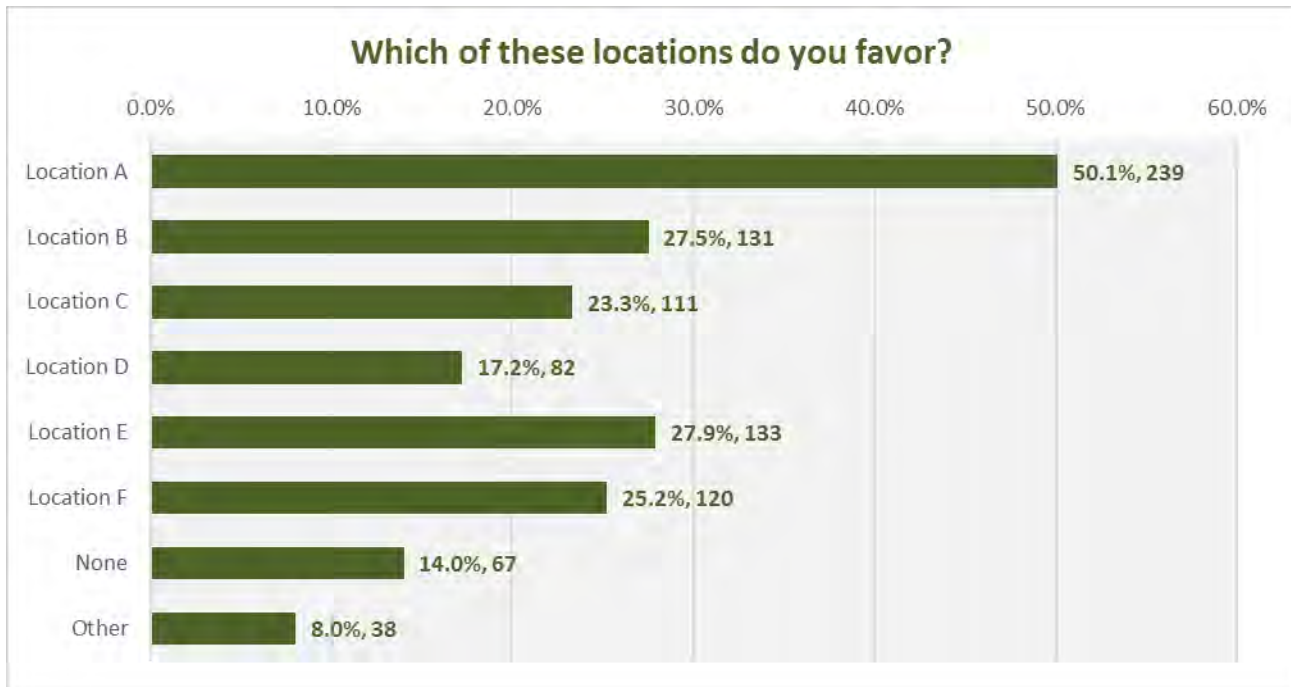




## POTENTIAL LOCALLY-SERVING COMMERCIAL AREA

The survey described potential locations and preliminary ideas for designs of a locally-serving neighborhood commercial area. Respondents selected which location(s) they favored (Question 8) and provided additional concerns or recommendations regarding the potential commercial site (Question 9). Figure 9 below shows the responses to Question 8.

Figure 9. Responses to Question 8



“Other” responses for a specific location included:

- Include height restrictions to preserve views
- Any of these locations would be good
- Do not include commercial in this area
- Avoid established residential areas
- Area in the South to avoid concentrating services in just one area
- Areas in the north/west closer to highway and more accessible.
- A location along Country Club Road
- Several locations should be mixed into the west side

Common themes in Question 9 included:

- Mix of support and opposition for the idea of integrating residential and commercial uses
- Support for the development of more housing, especially affordable housing options
- Strong opposition to “strip mall” commercial development
- Support for locally-serving mixed use development



Common themes in Question 11 included:

- Desire for a roundabout in the gateway location
- Desire for either a roundabout or traffic signal
- Need to improve traffic/turning at Mt. Adams Ave. and Cascade
- Like the idea of pleasant landscaping and a cohesive building design
- Concern about the cost of these improvements
- Support for improving the bicycle/pedestrian environment of the gateway
- Safety improvements are needed

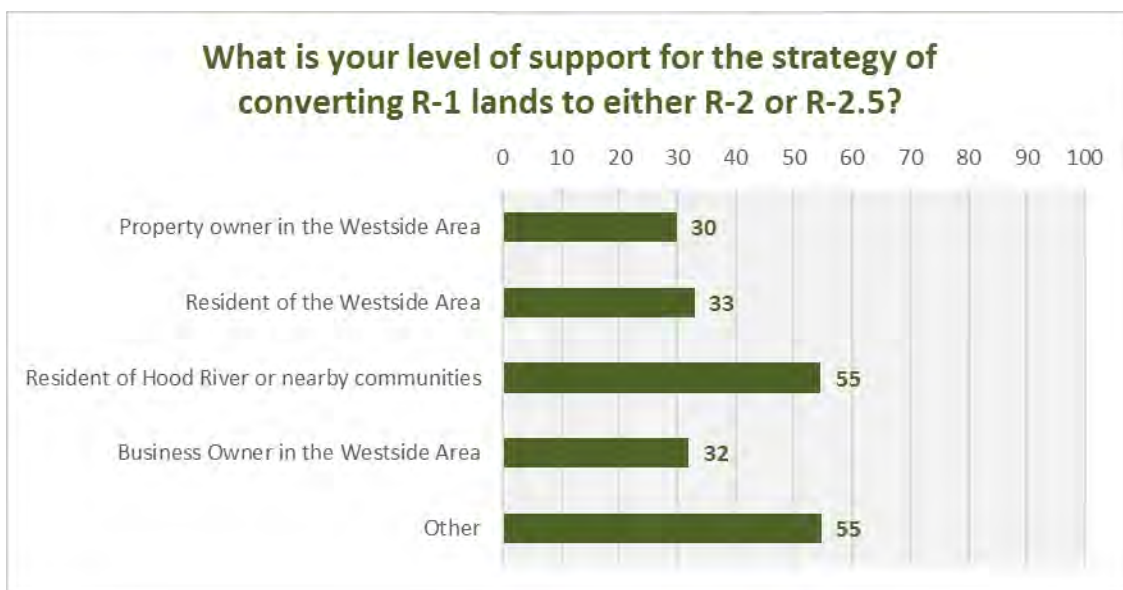
## LAND USE SCENARIO EVALUATION

The survey described the land use alternatives evaluated by the project team and asked several specific questions. Respondents were asked to:

- Rate their level of support for converting R-1 lands within the study area into either R-2 or “R-2.5” lands (Question 12)
- Rate their level of support for reducing the minimum lot size required in the R-2 zone (Question 13)
- If supportive of the reduction in Question 13, indicate whether they support reduction from 5,000 SF to either 4,000 SF or to 3,000 SF (Question 13)
- Rate their level of support for the amount and locations of R-3 High Density Housing in the Strong scenario (Question 15)
- Provide additional concerns or recommendations (Question 16)

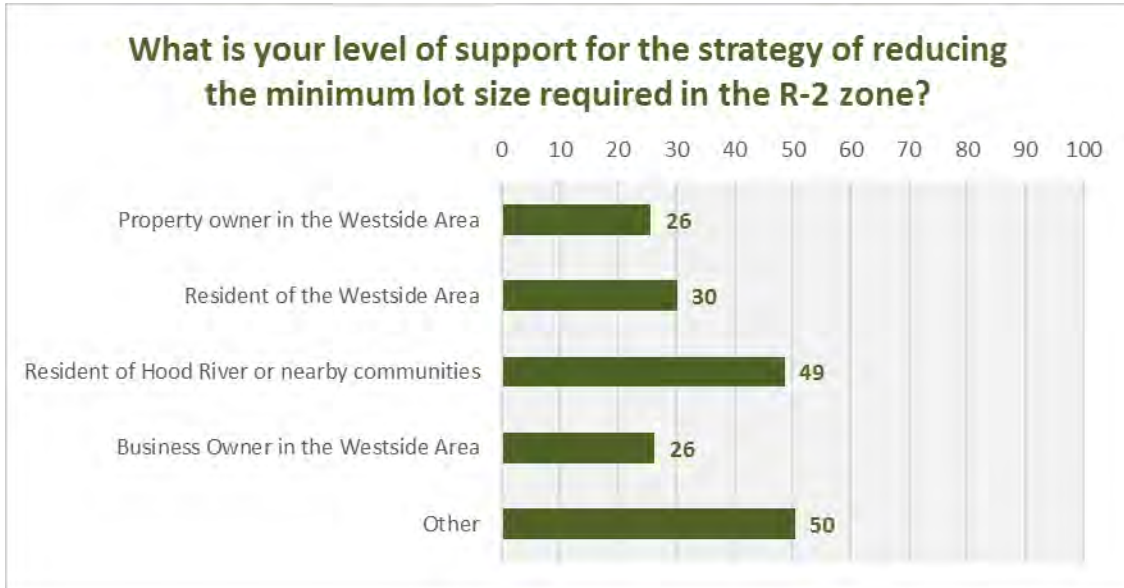
Overall, respondents had a level of support for converting R-1 lands to either R-2 or R-2.5 of 44 out of 100. This strategy was notably less popular among responses who identified as property owners, residents, or business owners in the Westside Area than with residents of Hood River and surrounding communities.

Figure 12. Responses to Question 12 by Respondents’ Interest in Westside Area



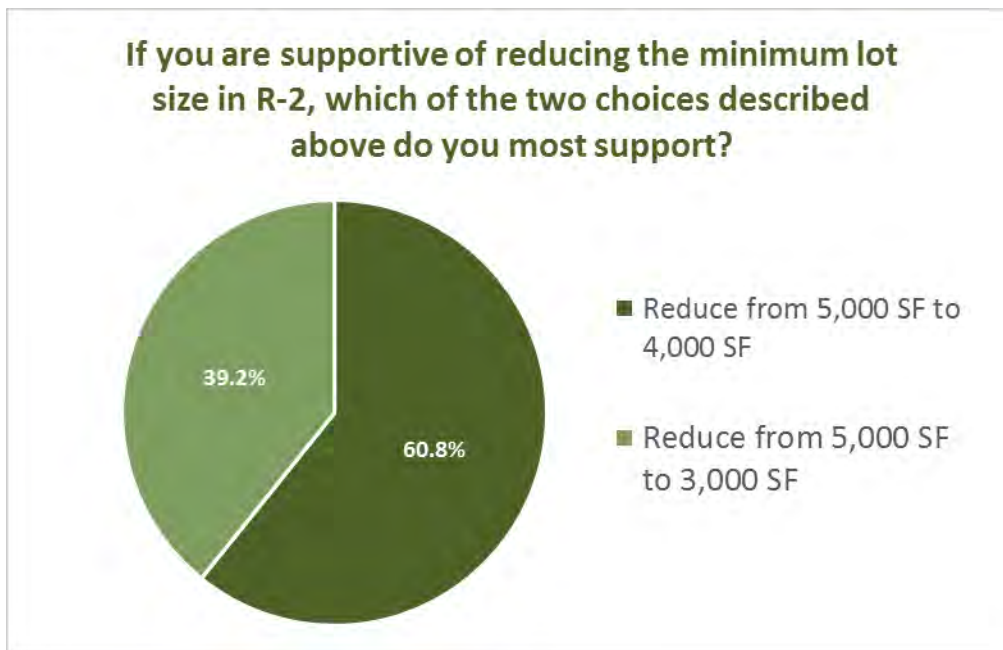
Respondents' level of support for reducing minimum lot sizes in the R-2 zone was 39 out of 100. This strategy was notably less popular among responses who identified as Property owners/residents/business owners in the Westside Area than with residents of Hood River and surrounding communities (see Figure 13).

Figure 13. Responses to Question 13 by Respondents' Interest in Westside Area



There was a clear preference for reducing R-2 minimum lot sizes from 5,000 SF to 4,000 SF over reducing them to 3,000 SF (see Figure 14 below).

Figure 14. Responses to Question 14



Question 15 asked respondents to rate their level of support for the amount and locations of R-3 high density housing in the Strong Scenario. Overall, this received a low score of 35 out of 100.



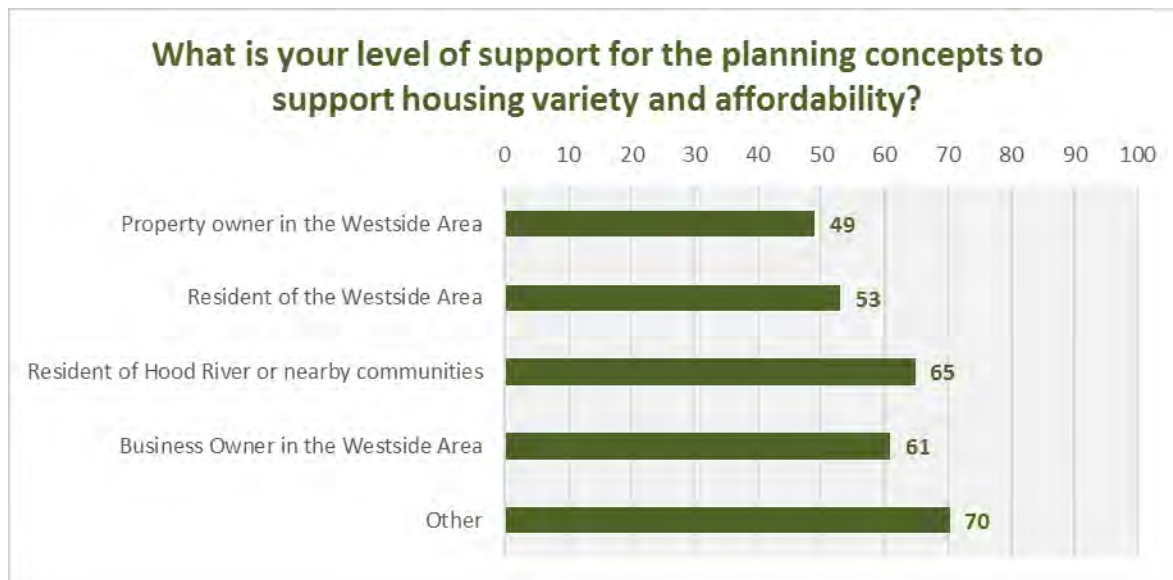


## HOUSING OPTIONS AND AFFORDABLE HOUSING

A brief overview of the key planning concepts related to affordability was provided, along with examples of single family, cottage, townhome, and multifamily housing. Respondents were asked their overall level of support for the planning concepts to support housing variety and affordability (Question 17), and were then asked to share their thoughts on housing affordability in the Westside Area (Question 18).

Overall, respondents had an average level of support of 59 out of 100 for the planning concepts to support housing variety and affordability. Figure 17 shows the responses to Question 17 broken down by respondents' answer to Question 1.

Figure 17. Responses to Question 17 by Respondents' Interest in Westside Area



Common themes in Question 18 included:

- Recognition of a city-wide need for more affordable housing options
- A mix of support and opposition to the development of affordable housing in the Westside Area
- Need for stricter regulations on short-term rentals and vacation homes
- Concern about reduced property values
- Concern about additional density and population growth
- Support for mixed-use development
- Concern about loss of the Westside Area's rural character
- Concern about the impact that population growth will have on existing infrastructure, services, and schools





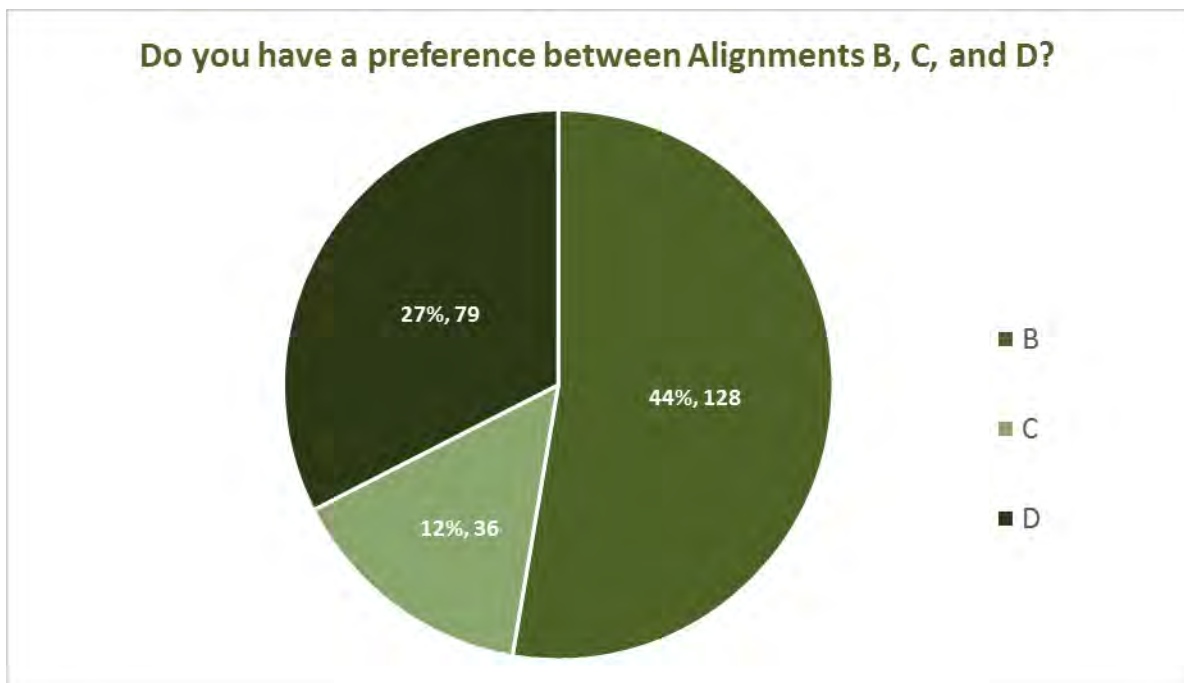
“Other” responses included:

- Concern about Westside Area neighborhood streets becoming thoroughfares for trucks
- Cost of acquiring properties for the road
- Limiting through-access to other neighborhoods
- Support for future transit
- Desire for additional safe pedestrian and bicycle infrastructure
- Concern about the safety of children on neighborhood streets
- Support for additional parks and open spaces
- General traffic and speeding concerns
- Concerns about safety and maintenance due to the steep grade

Question 20 asked respondents to indicate their preference between alignments B, C, and D with the understanding that the choices are still under study. Overall, the majority of respondents (44%) indicated a preference for Alignment B (see Figure 20). Reasons for the preference included:

- Traffic distribution
- Access to I-84 from the south side of town without having to use neighborhood streets
- Minimizing disruptions to the flow of traffic
- Makes better use of existing connections
- Provides access to the school
- Less of an impact to existing neighborhoods
- Provides a needed north-south connector

Figure 20. Responses to Question 20



# DEMOGRAPHICS

Figure 21. Age

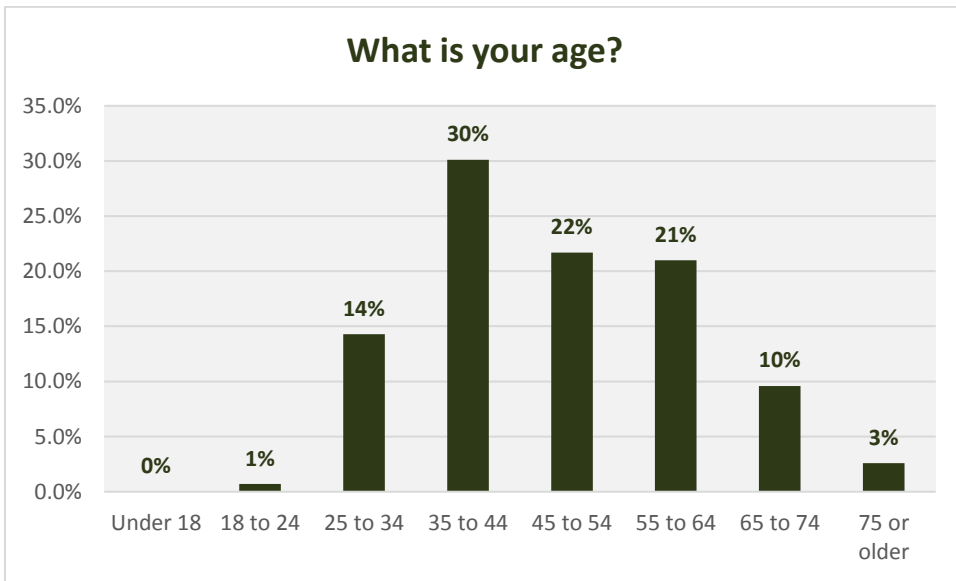


Figure 22. Household Income

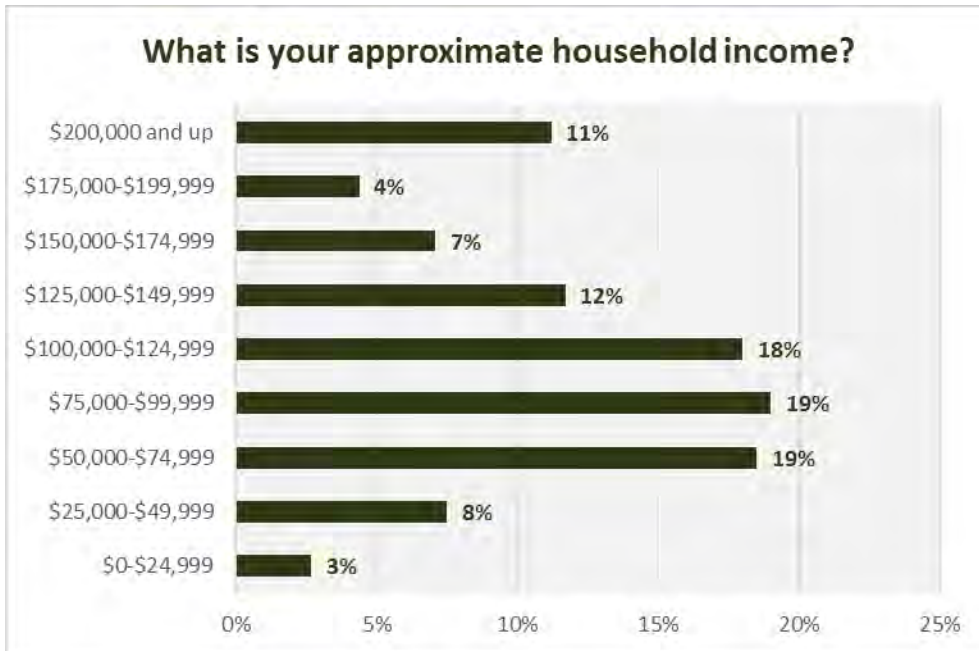


Figure 23. Rent/Own

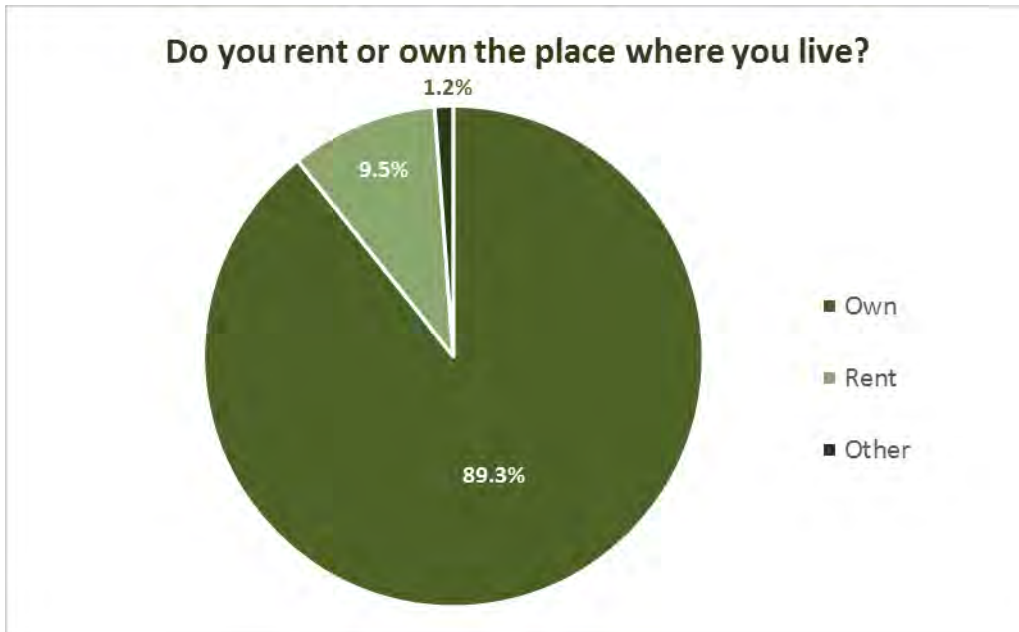


Figure 24. Number of Household Members

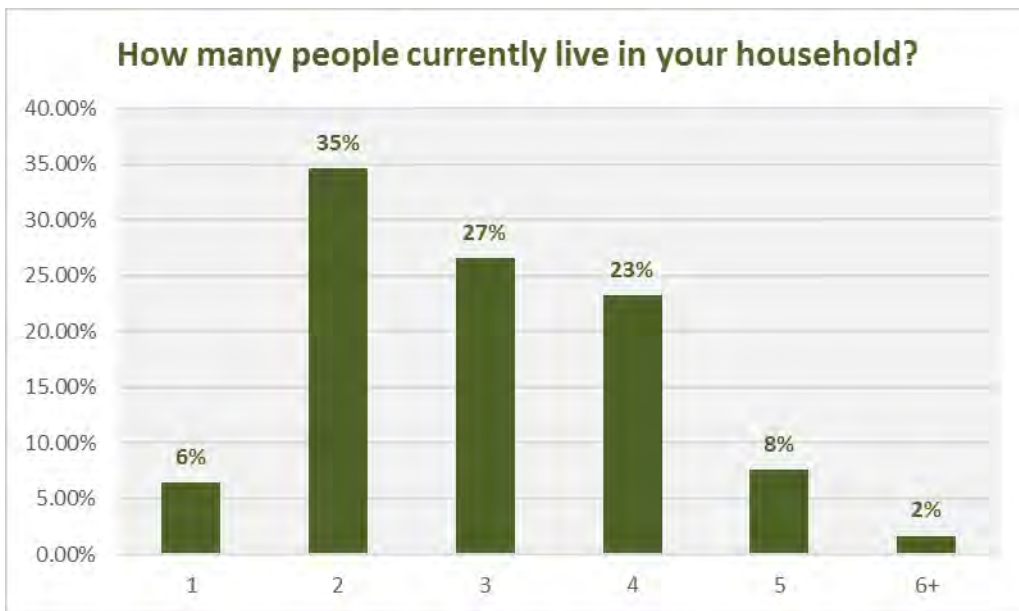
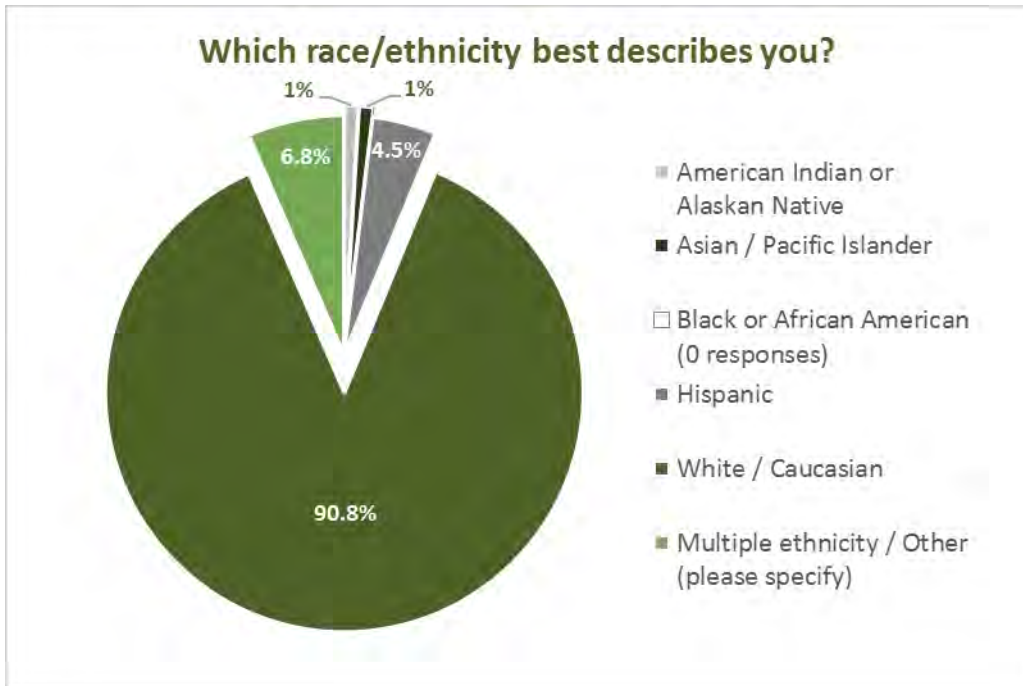
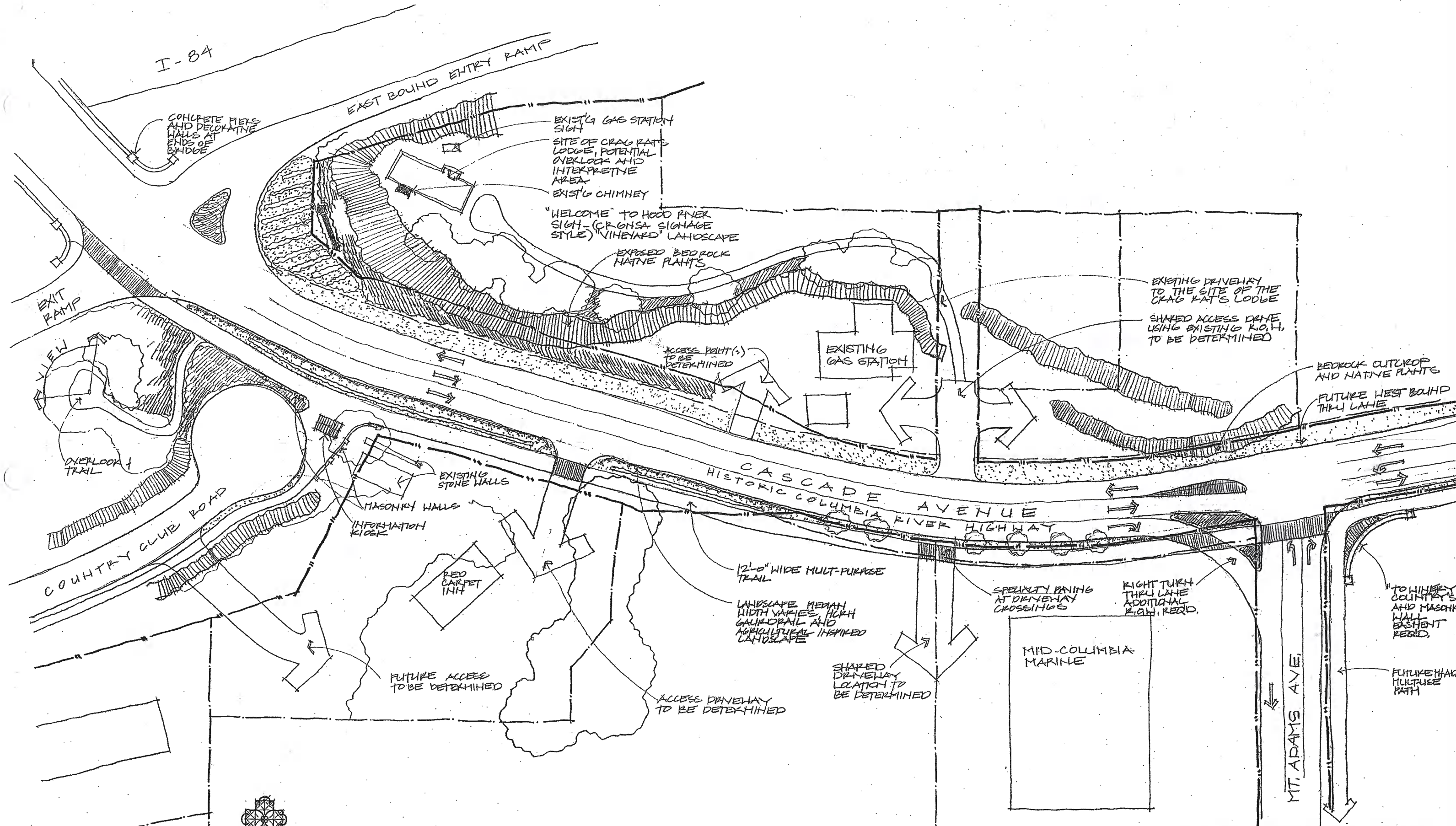


Figure 25. Race/Ethnicity





## APPENDIX F: 2010 EXIT 62 CONCEPT PLAN



Quatrefort, Inc.  
 Design • Landscape Architecture • Space Planning  
 400 SE 8th Ave. Portland, Oregon 97217  
 Tel: (503) 255-2955 Fax: (503) 255-2460

The Office of Bibi Gaston

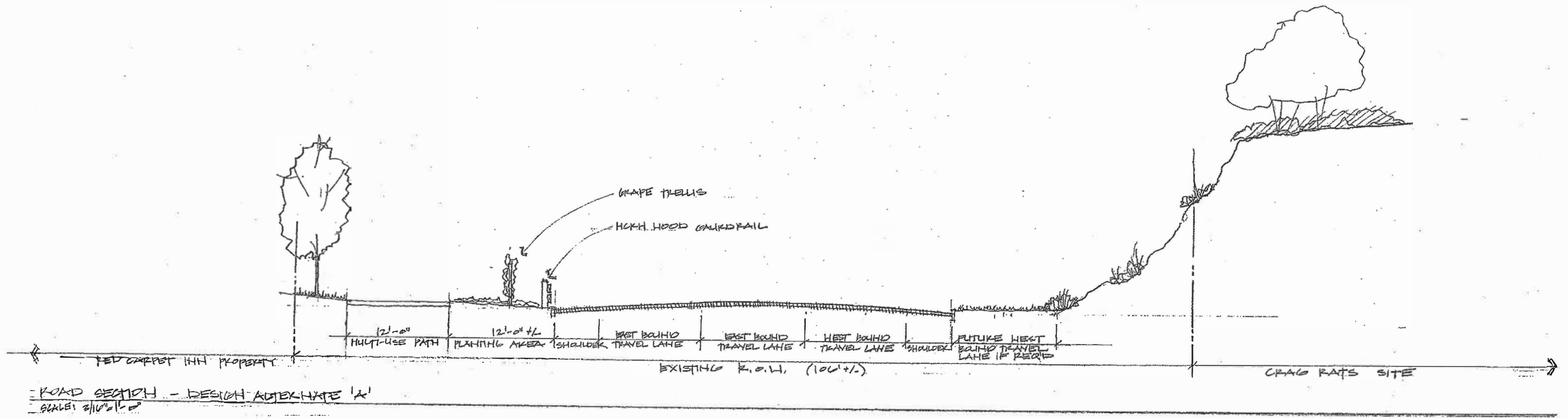
**EXIT 62 STUDY AREA**  
 Historic Columbia River Highway  
 Hood River, Oregon  
 Oregon Department of Transportation

Concept Plan 'Alt A'  
 Scale 1" = 30' - 0"

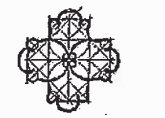
3.22.10

29

SK.1



ROAD SECTION - DESIGN ALTERNATE 'A'  
 SCALE: 3/16" = 1'-0"



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 201 SE 8th Ave. Portland, Oregon 97214

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**EXIT 62 STUDY AREA**  
 Historic Columbia River Highway  
 Hood River, Oregon  
 Oregon Department of Transportation

3.22.10

Road Cross Sections

31 SK13