

**STAFF REPORT**

TO: Clackamas County Planning Commissioners
FROM: Karen Buehrig, Transportation Planning Supervisor
DATE: May 12, 2016
RE: File ZDO-255: Proposed Amendments to the SE 172nd Ave / SE 190th Drive Corridor Management Plan, a Special Transportation Plan adopted into Clackamas County's Comprehensive Plan

PROPOSAL

ZDO-255 is a legislative text amendment to the "*SE 172nd Avenue/SE 190th Drive Corridor Management Plan (Revised April 2016)*" which addresses the re-alignment of the planned intersection at SE 172nd Ave. and SE Troge Rd. to minimize impacts to an identified wetland. The *SE 172nd Avenue/SE 190th Drive Corridor Management Plan* is adopted by reference into the County's Comprehensive Plan (Appendix A) and is one of the Special Transportation Plans identified in Chapter 5 of the County's Comprehensive Plan ("Plan").

Section 7 (Corridor Management Plan) from the *SE 172nd Avenue/SE 190th Drive Corridor Management Plan (Revised April 2016)* is included in this packet (**Attachment 1**). This Section contains the proposed changes related to the new intersection alignment, including modifications to the following figures and to the text on the following pages:

- Page 7-4
- Pages 7-9 through 7-12
- Pages 7-21 through 7-22
- Figure 7-1A
- Figure 7-1B
- Figure 7-2C
- Figure 7-2D

No amendments to the County's Comprehensive Plan policies are proposed or needed.

BACKGROUND

The City of Happy Valley and Clackamas County jointly adopted the *SE 172nd Avenue/SE 190th Drive Corridor Management Plan* in 2012. SE 172nd Ave is an arterial road that is owned and maintained by Clackamas County, but it is located within Happy Valley. The jointly-adopted

plan provides guidance on the location and the cross-sections within the SE 172nd Ave / SE 190th Drive corridor so that as urban levels of development occur, these roads will transition from rural roads into facilities that will meet the needs of surrounding urban uses.

In order to make amendments to the *SE 172nd Avenue/SE 190th Drive Corridor Management Plan*, Happy Valley and Clackamas County are conducting consecutive public hearings. The proposed amendments impact properties that are wholly within Happy Valley. The Happy Valley Planning Commission held a public hearing on April 12th, 2016, taking public comments on the proposed changes and made a recommendation for approval of the proposed amendments to the Happy Valley City Council. The Happy Valley City Council held a public hearing on May 3rd, 2016. The only comment received by the city was a comment in favor of the proposed amendments. The Happy Valley City Council approved the proposed amendments, as noted in the attached ordinance (**Attachment 2**).

The proposed amendments are requested because after the adoption of the original *SE 172nd Avenue/SE 190th Drive Corridor Management Plan*, it was discovered that a key alignment -the east-west collector facility going from SE 162nd Avenue to SE 172nd Avenue through the (former) Pleasant Valley Golf Course and Troge Road - was severely impacted by a much larger than anticipated wetland located along the south side of Troge Road (where the re-aligned road was proposed to exist).

Three alternative alignments were considered for this intersection, as described in **Attachment 3**. The preferred alternative, as adopted by the city of Happy Valley, adjust the location of the east-west collector so that it intersects SE 172nd Ave directly across from Troge Road, then uses the existing Troge Road alignment to connect to areas to the east. This proposal minimizes impacts to the wetlands south of Troge Road.

ANALYSIS AND FINDINGS

The following rules and requirements must be considered for a legislative Comprehensive Plan amendment.

1. **Legislative text amendment.** The proposed amendments to the Comprehensive Plan are legislative. Section 1400 of the Clackamas County Zoning & Development Ordinance (ZDO) establishes procedural requirements for legislative amendments, which have been or are being followed in this case. The ZDO contains no review criteria that must be applied when considering an amendment to the text of the ZDO or the Plan.
2. **Required coordination.** Chapter 11 of the Plan contains a section entitled *City, Special District and Agency Coordination*. Clackamas County, Happy Valley, the potentially impacted service districts, Metro and other identified interested parties were all notified of the proposed Comprehensive Plan amendments. This level of notification furthers the goals and policies of this section of the Plan. .
3. **Procedural Standards for Plan Amendments.** Chapter 11 of the Plan also contains a section

entitled *Amendments and Implementation*, which lays out procedural standards for Plan amendments, requires the Plan and the ZDO to be consistent with Statewide Planning Goals and Guidelines and Metro's Urban Growth Management Functional Plan, and requires the ZDO to be consistent with the Plan. Policy 3.0 establishes procedural standards.

The process followed for ZDO-255 is compliant with these standards. Specifically, notice was mailed to at least 35 days before the scheduled public hearing, and the Department of Land Conservation and Development (DLCD) and Metro were provided with an opportunity to review and comment on the proposed amendments in accordance with state law. An advertised public hearing is being held before the Planning Commission and the Board of County Commissioners to consider the proposed amendments.

Because this proposal includes new road alignments with Metro's boundary that would be adopted into the County's Transportation System Plan (Chapter 5 of the Comprehensive Plan), it also needs to be consistent the Regional Transportation Plan and the Regional Transportation Functional Plan. The Statewide Planning Goals and Guidelines, Urban Growth Management Functional Plan, the Regional Transportation Plan and the Regional Transportation Functional Plan are addressed below.

4. **Statewide Planning Goals and Guidelines.**

- a. **Goal 1 - Citizen Involvement.** The proposed amendments do not propose to change the structure of the county's citizen involvement program. Notice of the proposed amendment was provided to affected cities and a list of interested parties. Also, notice of the Planning Commission and Board of County Commissioners hearings was published in the local newspaper, the *Clackamas Review*. In addition, public hearings were also held by the Happy Valley Planning Commission and City Council.
- b. **Goal 2. Land Use Planning.** Not applicable because the proposed amendments do not propose to change the county's land use planning process.
- c. **Goal 3. Agricultural Lands.** Not applicable because the proposed amendments make changes to the regulation of Agricultural Lands.
- d. **Goal 4. Forest Lands.** Not applicable because the proposed do not proposed changes to the regulation of Forest lands.
- e. **Goal 5. Open Spaces, Scenic and Historic Areas, and Natural Resources.** Not applicable because the proposed amendments do not propose to change regulation of Open Spaces, Scenic and Historic Area and Natural Resources.

- f. Goal 6. Air, Water and Land Resources Quality. Not applicable because the proposed amendments do not propose to change regulation of air, water and land resources.
- g. Goal 7. Areas Subject to Natural Disasters and Hazards. Not applicable because the proposed amendments do not propose to change regulation of areas subject to natural disasters and hazards.
- h. Goal 8. Recreational Needs: Not applicable because the proposed amendments do not propose to change policies pertaining to recreational uses.
- i. Goal 9. Economy of the State. Not applicable because the proposed amendments are consistent with Goal 9 because they do not propose to alter the supply of land designated for employment.
- k. Goal 10: Housing: Not applicable because the text amendments do not propose to change the county's Plan or implementing regulations regarding housing.
- l. Goal 11: Public Facilities and Services: Not applicable because no changes are being proposed to the Public and Facilities Plan.
- m. Goal 12: Transportation: The intent of Goal 12 is *"to provide and encourage a safe, convenient and economic transportation system."* The purpose of the proposed update to the *SE 172nd Avenue/SE 190th Drive Corridor Management Plan* is provide a more efficient and effective solutions to the connection of the east/west collector road at SE 172nd Ave and SE Troge Rd, which will minimize impacts to the wetlands in the area. This proposal is in compliance with Goal 12. Detailed findings of compliance related to OAR 660-12 can be found in number 7 (below).
- n. Goal 13: Energy Conservation: Not applicable because the amendments do not propose to change the county's Plan or implementing regulations regarding energy conservation.
- o. Goal 14: Urbanization: Not applicable because the amendments do not propose to change the county's Plan or implementing regulations regarding urbanization.
- p. Goal 15: Willamette River Greenway: Not applicable because the amendments do not propose to change the county's Plan or implementing regulations regarding the Willamette River Greenway.

Finding: This proposal is consistent with all applicable Statewide Planning Goals.

- 5. Urban Growth Management Functional Plan. Metro was notified of this proposal. To date, no comments have been received. The proposed amendments do not change any of the

implementing regulations related to the Urban Growth Management Functional Plan.

Finding: This proposal is consistent with all applicable Titles of the Metro Urban Growth Management Functional Plan.

6. Metro Regional Transportation Plan (RTP) - 2014 and Regional Transportation Functional Plan (RTFP)

The Regional Transportation Plan (RTP) establishes the framework for regional and local transportation planning.

The sections of the RTP that are applicable to the proposed amendments are

- 2.5.1 *Regional System Design and Placemaking Concept*, including Figure 2.10 and Table 2.6
- 2.5.2 *Arterial and Throughway Network*
- 2.5.4 *Regional Freight Network*

The proposed amendments to the SE 172nd Ave / SE 190th Drive Corridor Plan is consistent with this Section 2.5.1 of the RTP because the proposed design elements are consistent with the Regional Street design, as designated in the RTP. A Regional Street is typically a major arterial with four travel lanes, a turning lane, bike lanes and sidewalk. The street design for 172nd Ave at this location complies with these design guidelines.

The proposed amendments are consistent with Section 2.5.2 because they support connections for regional and local land uses in this area. They will help create a well-connected network of complete streets and improve local and collector street connectivity.

Finally, the amendments are consistent with Section 2.5.4 because they support the Regional Freight Network by allowing for a more efficient and ecologically supportive option for the intersection of 172nd Ave and Troge Road.

Finding: This proposal is consistent with all applicable Metro Regional Transportation Plan regulations.

7. State Statutes and Administrative Rules (Transportation Planning Rule, Oregon Highway Plan and other Plans)

- a. OAR 660-12 (Transportation Planning): The purpose of the TPR is to implement Statewide Planning Goal 12 (Transportation) and “*promote the development of safe, convenient and economic transportation systems that are designed to reduce reliance on the automobile so that the air pollution, traffic and other livability problems faced by urban areas in other parts of the country might be avoided.*”

The proposed amendments do not include any Comprehensive Plan Map or Zoning Map amendments. The existing Comprehensive Plan designations and zoning districts along the corridor are consistent with the identified function, capacity and performance standards of the facilities identified in the Happy Valley TSP and thus meet the “balancing test” delineated within subsection (2)(e). Further, the proposed amendments include changes aimed at fulfilling the City’s transportation policies and requirements of the Transportation Planning Rule (TPR).

Finding: This proposal is consistent with the Transportation Planning Rule.

RECOMMENDATION

Staff recommends that the Planning Commission recommend approval the proposed amendments included in ZDO-255, as described in **Attachment 1**, to the Board of County Commissioners (BCC).

ATTACHMENTS

1. Proposed Clackamas County Comprehensive Plan amendments
 - a. Section 7 (Corridor Management Plan), SE 172nd Ave/ SE 190th Dr Corridor Management Plan (Revised April 2016)
 - b. Appendix A
2. Happy Valley Ordinance No. 494
3. Happy Valley Staff Report and attachments

February 2012

Revised April 2016



SE 172nd Avenue/190th Drive

CORRIDOR MANAGEMENT PLAN



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Final Report

SE 172nd Avenue/190th Drive Corridor Management Plan

Clackamas County, Oregon

Prepared For:

Clackamas County

150 Beavercreek Boulevard
Oregon City, OR 97045
(503) 742-4539

Prepared By:

Kittelson & Associates, Inc.

610 SW Alder, Suite 700
Portland, OR 97205
(503) 228-5230

In association with:

Cascade Earth Sciences, Inc.
Cogan Owens Cogan, LLC
Foundation Engineering, Inc.
Heritage Research Associates, Inc.
Mason, Bruce & Girard, Inc.
Michael Minor and Associates, Inc.
OTAK, Inc.

Project Manager: Marc Butorac, PE, PTOE
Project Engineers: Wade Scarbrough, PE; Eric Hathaway, PE
Project Principal: Dan Seeman

Project No. 10213.0

Initially Prepared : February, 2012

Updated: April 2016



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- Appendix A Environmental Baseline Report
- Appendix B VISUM Analysis of Preferred Alternative
- Appendix C Design Documentation of Preferred Build Alternative
- Appendix D Ordinance Language
- Appendix E Corridor Centerline Survey
- Appendix F Approval Documentation

The above appendixes, as well as the *Technical Appendix* that includes all of the original technical memoranda, are available under separate cover.

Preface

The development of this plan was guided by the Project Management Team (PMT) and Project Advisory Committee (PAC). The PMT and PAC members are identified below, along with members of the consultant team. The PMT was responsible for reviewing all work products and providing overall project direction and final recommendations to the decision making bodies that held public hearings on the plan. The PMT included representation from Clackamas County, Damascus, Gresham, Happy Valley and Metro. The PAC was responsible for reviewing all work products and providing input and local knowledge as well as recommendations to the PMT. The PAC was made up of local citizens, business owners and local officials. Their participation was instrumental in the development of the overall Corridor Management Plan that is presented in this report.

Project Management Team (PMT)

Larry Conrad
Clackamas County, Principal Transportation Planner / County
Project Manager

Steve Gaschler
City of Damascus, Public Works Director

Ellen Rogalin
Clackamas County Community Relations Specialist

Anthony Butzek
Metro Transportation Engineer

Michael Walters
City of Happy Valley, Economic & Community Development
Director

Mike Bezner
Clackamas County
Transportation Engineering Management

Carrie Brennecke
City of Damascus, Associate Planner

Katherine Kelly
City of Gresham,
Transportation Planning Manager

Ross Kevlin
ODOT Contract Manager

Carol Earle
City of Happy Valley City Engineer

Project Advisory Committee (PAC)

Kim Anderson
Sunrise Water Authority

Katya Amato
Area Resident

Ben Baldwin
TriMet

David Widmark
Gresham City Council

Donald Hanna
Damascus Planning Commission

Dale Guenther
Clackamas County Bike/Ped Bike Advisory Committee

Cheryl McGinnis
Clackamas River Basin

Tom Andrusko
Happy Valley City Council

Paul Savas
Clackamas County Board of Commissioners

Stan Bohnstedt
Pleasant Valley Planning Association

Marlo Dean
Damascus City Council

Dan Henninger
Clackamas County WES

Diane Morrow
Happy Valley Planning Commission

Larry Michaelson
Area Resident



Wilda Parks
North Clackamas Chamber

Steve Sala
Area Resident

Michael Temple
Clackamas Fire District

Kevin Reedy
Damascus Committee for Citizen Involvement

Jo Ellen Schiedler
Area Resident

Dan VanScoy
North Clackamas School District

Project Stakeholders

Catherine Albrecht
Happy Valley Traffic & Safety

Richard Anderson
Gresham Planning Commission

Tom Andrusko
Happy Valley Council

Bill Bailey
Gresham Planning Commission

Bruce Butler
Happy Valley Business Alliance

Steve Campbell
Happy Valley Traffic & Safety

Matthew Clark
Johnson Creek Watershed Council

Jeff Corcoran
Gresham Transportation Subcommittee

Harvey Cummings
Damascus Planning Commission

James Finucane
Land Owner

Kenneth Gores
Area Resident

Matt Grady
Gramor Development

Mitch Grubb
Land Owner

Michelle Healy
North Clackamas Park & Recreation

Diana Helm
Damascus City Council

Jason Howard
Johnson Creek Watershed Council

Dan Johnson
Clackamas Count URA

Bruce Kayser
Land Owner

Kenneth Koblitz
Happy Valley Planning Commission

Don Kemp
Clackamas County WES

Mike Kuenzi
Clackamas County WES

Rick Larson
Centennial School District

Charlie McAlister
Centennial School District

George Powell
Abundant Life Church

Karen Rush
Scouters Mountain Elementary School

Donald Schneider
Area Resident

Tom Scott
Land Owner

Randy Shannon
Damascus City Council

Rob Wheeler
Happy Valley City Council

Terry Wilson
Real Estate

Consultant Team

Kittelson & Associates, Inc.

Marc Butorac, PE, PTOE - Project Manager
Wade Scarbrough, PE –Project Engineer
Eric Hathaway, PE – Project Engineer
Shing Tsoi – Project Analyst
Dan Seeman - Project Principal

Cogan Owens Cogan, Inc.

Jim Owens
Kirstin Greene, AICP
Ric Stephens
Alisha Dishaw

Cascade Earth Sciences, Inc.

Ryan Tobias, PE

Foundation Engineering, Inc.

Mitch Schaub, P.E., G.E.

Otak, Inc.

Amanda Owings, PE
Brad Swearingen, PE
Joe Dills, AICP

Mason Bruce and Girard, Inc.

Stuart Myers

Michael Minor Associates, Inc.

Michael Minor

Heritage Research Associates, Inc.

Kathryn Toepel



Section 7 Corridor Management Plan

7. CORRIDOR MANAGEMENT PLAN

This chapter presents the Corridor Management Plan for connecting SE 172nd Avenue and 190th Drive between SE Sunnyside Road and SE Cheldelin Road. Specifically, the plan identifies the following elements:

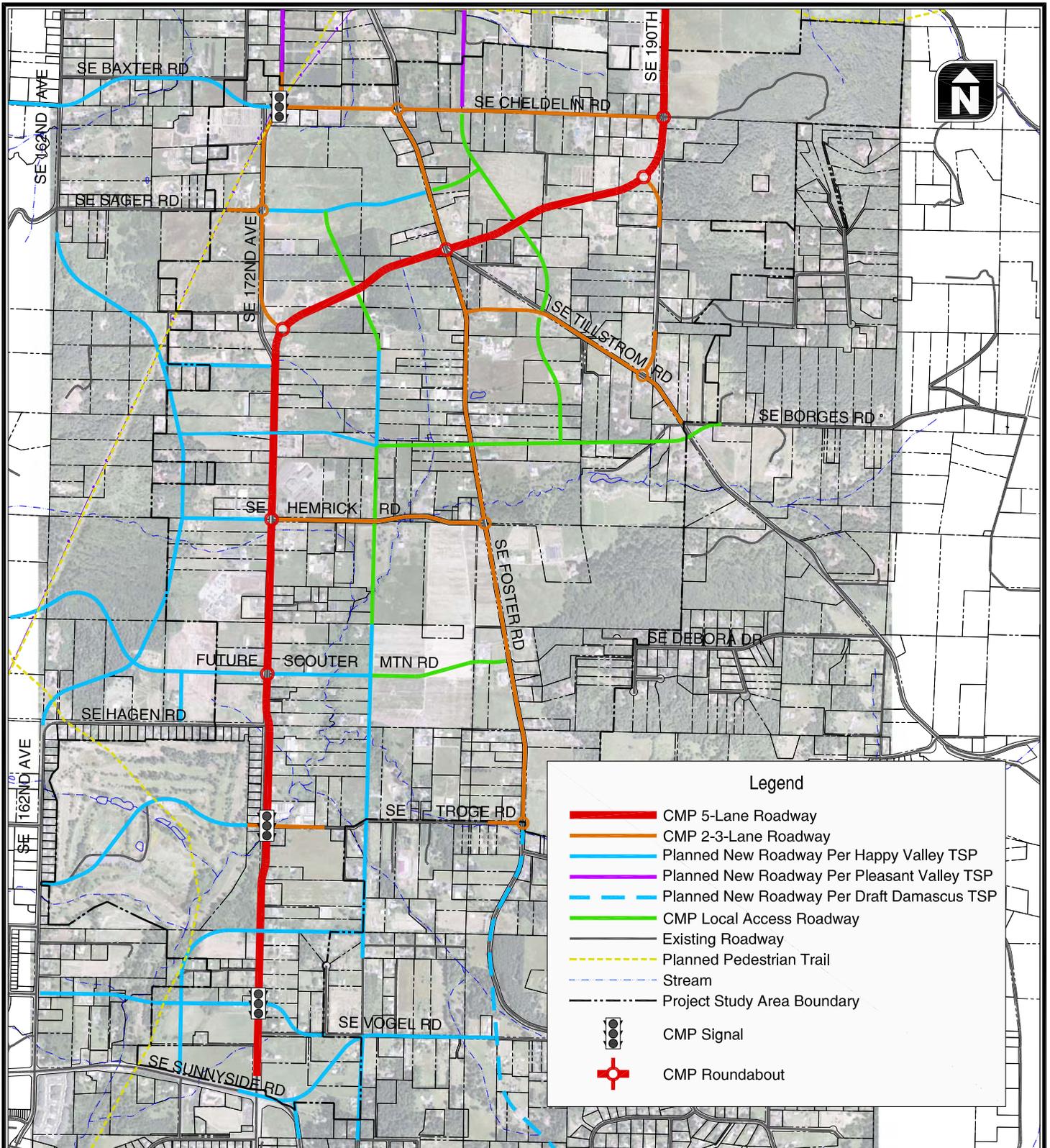
- Preliminary alignment design,
- Typical streetscape sections,
- Intersection lane configurations and traffic control treatments,
- Local access plan,
- Bridge and culvert considerations,
- Construction cost estimate, and
- Other design considerations.

OVERVIEW

The Corridor Management Plan provides a comprehensive plan of transportation improvements to establish the long-term vision for the SE 172nd Avenue/190th Drive Corridor and to serve the growing multi-modal travel needs within the area for the next 25 years and beyond, as described in the purpose and need statement in Chapter 1. The plan was developed with extensive public involvement through the alternative screening and evaluation process, as described in Chapters 2 and 6.

Figure 7-1A and 7-1B present an overview map of the Corridor Management Plan, including the roadway improvements and intersection treatments within the PSA. In addition to the existing roads and environmental features, this map also displays planned new roadways based on the adopted transportation plans from the cities of Gresham and Happy Valley. The City of Damascus's transportation plan is currently under development, and the planned new roadways from the city's *draft* plan are also shown.

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Corridor Management Plan Overview Map

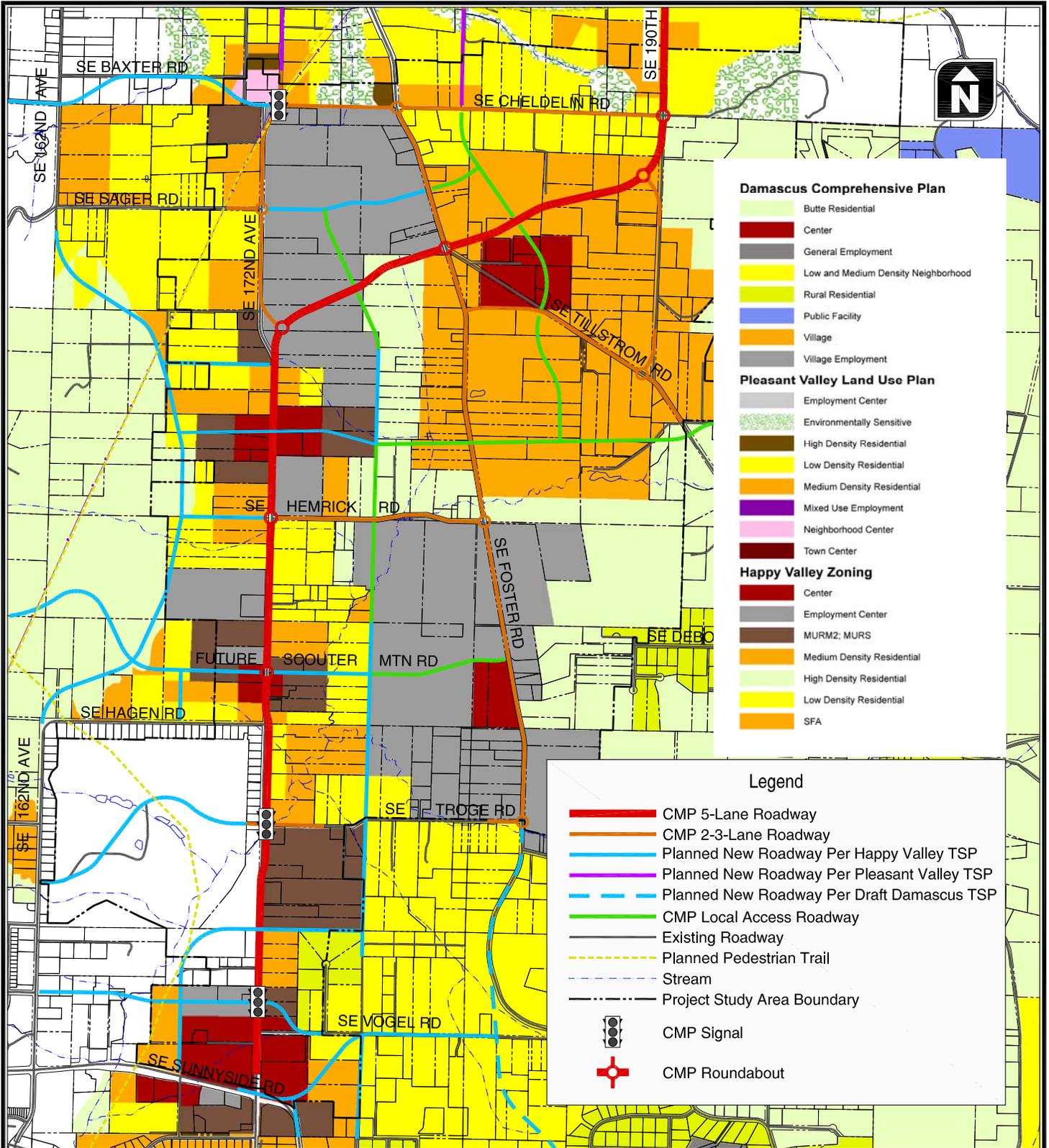


172nd / 190th Corridor Plan



Figure 7-1A

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Corridor Management Plan Overview Map



Figure 7-1B

Table 7-1 summarizes roadway improvement projects identified in this Corridor Management Plan. The list is not comprehensive; minor connections to existing or future roadways will be subject to planning approvals and requirements at the time of development.

Table 7-1: Summary of Corridor Management Plan Roadway Improvements

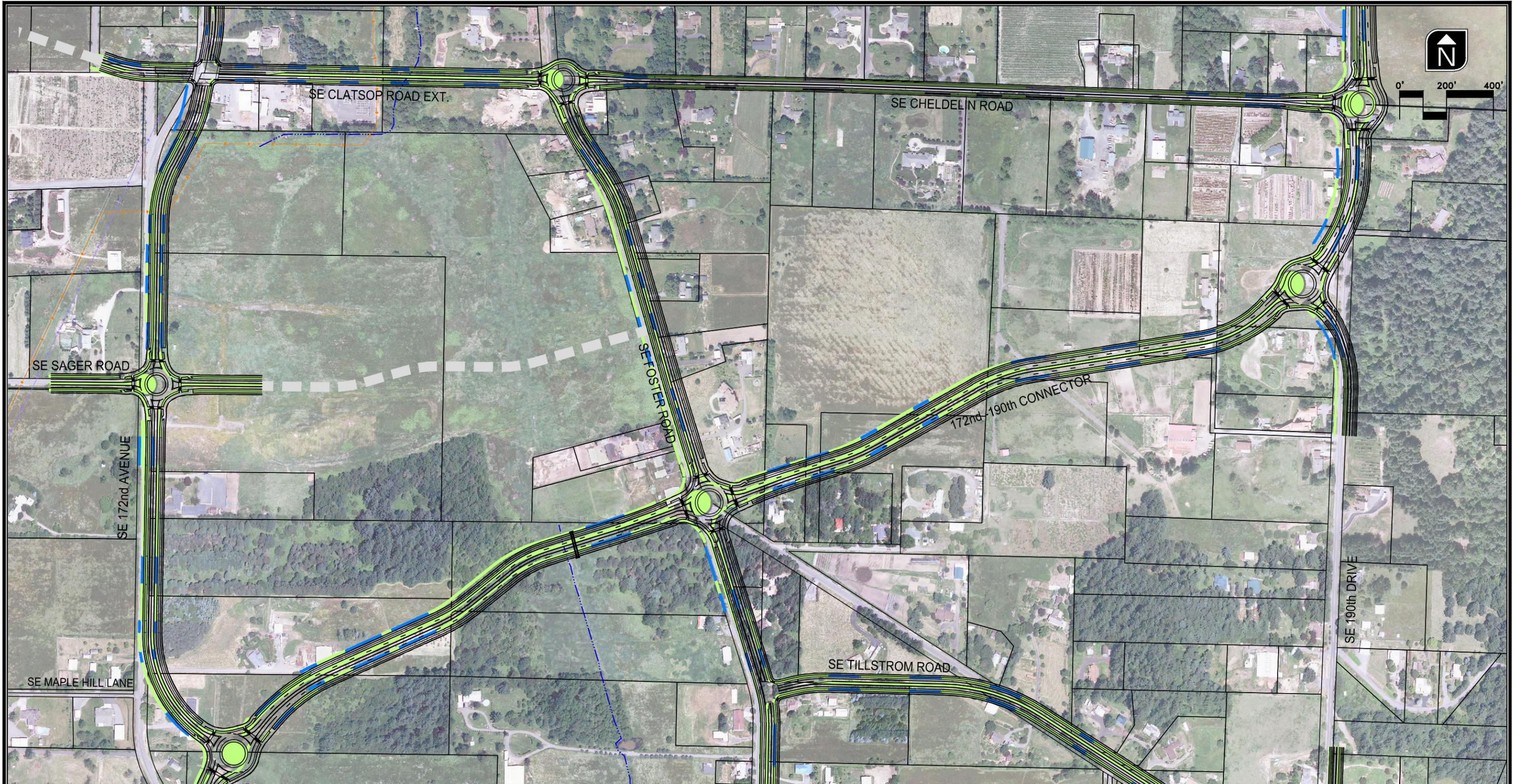
#	Roadway	Location	Description
1	SE 172nd Avenue	SE Sunnyside Road to SE 172nd-190th Connector	Widen to five lanes
2	SE 172nd Avenue	SE 172nd-190th Connector to SE Cheldelin Road	Widen to three lanes
3	SE 172nd-190th Connector	SE 172nd Avenue to SE Foster Road	Construct new five-lane roadway
4	SE 172nd-190th Connector	SE Foster Road to SE 190th Drive	Construct new five-lane roadway
5	SE Cheldelin Road (SE Clatsop Street Extension)	SE 172 nd Avenue to SE Foster Road	Construct new two-lane roadway
6	SE Cheldelin Road	SE Foster Road to SE 190 th Drive	Widen to two lanes
7	SE Foster Road	SE Cheldelin Road to SE Troge Road	Widen to three lanes
8	SE Tillstrom Road	SE Foster Road to SE 190 th Drive	Widen to three lanes and realign at Foster Road intersection
9	SE Hemrick Road	SE 172 nd Avenue to SE Foster Road	Widen to two/three lanes
10	SE Troge Road	SE 172 nd Avenue to approx. 1000' east of SE 172 nd Avenue	Realign roadwayWiden to three lanes and construct new bridge

Details related to the alignments, cross-sections, intersection treatments, and additional design considerations are provided in the remainder of this section.

PRELIMINARY ALIGNMENT DESIGN

The conceptual design for the Corridor Management Plan improvements is shown in Figures 7-2A through 7-2D. These figures display 1"=400' scale drawings of the preliminary (15% level) horizontal design, including intersection layouts, pedestrian and bicycle facilities, and approximate right-of-way needs. Additional design information can be found in *Appendix C*, which includes 1"=100' scale horizontal plan views, preliminary vertical alignment design information, and conceptual stormwater utility plans.

The key features and design considerations for each of the various segments of the Corridor Management Plan are described below.



LEGEND	
	EXISTING CREEK CHANNEL
	EXISTING TAX LOT LINE
	PROPOSED CURB
	PROPOSED ROADWAY STRIPING
	PROPOSED PLANTER / MEDIAN
	PROPOSED STORMWATER FACILITY

Corridor Management Plan Improvements (Sheet 1 of 4)



**Figure
7-2A**



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LEGEND	
	EXISTING CREEK CHANNEL
	EXISTING TAX LOT LINE
	PROPOSED CURB
	PROPOSED ROADWAY STRIPING
	PROPOSED PLANTER / MEDIAN
	PROPOSED STORMWATER FACILITY

Corridor Management Plan Improvements (Sheet 2 of 4)



**Figure
7-2B**



LEGEND	
	EXISTING CREEK CHANNEL
	EXISTING TAX LOT LINE
	PROPOSED CURB
	PROPOSED ROADWAY STRIPING
	PROPOSED PLANTER / MEDIAN
	PROPOSED STORMWATER FACILITY

Corridor Management Plan Improvements (Sheet 3 of 4)



**Figure
7-2C**



LEGEND	
	EXISTING CREEK CHANNEL
	EXISTING TAX LOT LINE
	PROPOSED CURB
	PROPOSED ROADWAY STRIPING
	PROPOSED PLANTER / MEDIAN
	PROPOSED STORMWATER FACILITY

Corridor Management Plan Improvements (Sheet 4 of 4)



**Figure
7-2D**

1) SE 172nd Avenue: SE Sunnyside Road to SE 172nd-190th Connector

The preliminary horizontal design for the SE 172nd Avenue corridor from the new 172nd-190th Connector to SE Sunnyside Road is displayed in Figures 7-2B through 7-2D. As shown, the design consists of widening the corridor to five lanes and matching to the existing five-lane cross-section approximately 350 feet north of SE Sunnyside Road.

The Corridor Management Plan calls for widening symmetrically on both sides of the existing centerline, with the exception of the section generally located between SE Hagen Road and SE Troge Road. This quarter-mile section includes twelve existing single-family residences on the west side, each with individual access to SE 172nd Avenue. Maintaining these accesses onto the five-lane arterial would not be consistent with access management guidelines, and modifying or consolidating accesses while keeping SE 172nd Avenue on its existing centerline would not be feasible without substantially impacting all of the residences. Therefore, the roadway centerline alignment shifts approximately 45 feet east of the existing centerline in this section. As shown on Figure 7-2C, a two-lane frontage road would be constructed between SE Hagen Road and SE Troge Road to provide access to the residential properties on the west side of SE 172nd Avenue. The frontage road will outlet to SE Hagen Road ~~and a new SE Troge Road extension, respectively~~ with a cul-de-sac at its southern end. An emergency access route would be provided at the end of the cul-de-sac. SE Hagen Road will be disconnected from SE 172nd Avenue. ~~Immediately south of the existing SE Troge Road intersection, a~~ new bridge spanning both SE 172nd Avenue and SE Troge Road will replace the existing Rock Creek crossing. This structure will be approximately 140-feet long to account for the ~~sharp~~ angle at which the roadway and stream intersect.

2) SE 172nd Avenue: SE 172nd-190th Connector to SE Cheldelin Road

As shown in Figure 7-2A, the remaining segment of SE 172nd Avenue north of the new 172nd-190th Connector would be widened to provide a three-lane cross-section and would primarily remain on its current alignment from SE Cheldelin Road to the new 172nd-190th Connector intersection. The only exception is the southernmost portion of the roadway, which will be realigned approximately 200 feet north of the SE Maple Hill Lane intersection to the new 172nd-190th Connector intersection. The alignment utilizes a roundabout intersection with the northern leg of SE 172nd Avenue intersecting the new 172nd-190th Connector perpendicularly.

3) SE 172nd-190th Connector: SE 172nd Avenue to SE Foster Road

Figure 7-2A displays the proposed horizontal alignment for the new five-lane roadway connecting SE 172nd Avenue and SE 190th Drive. As shown, this new alignment diverges from the existing SE 172nd Avenue alignment beginning just south of the SE Wooded Heights Road intersection and heads north-northeast connecting to SE 190th Drive just south of SE Cheldelin Road. The new roadway cuts diagonally across existing properties and intersects with SE Foster Road at approximately the location of the existing SE Foster Road/SE Tillstrom Road intersection.

4) SE 172nd-190th Connector: SE Foster Road to SE 190th Avenue

As shown in Figure 7-2A, the SE 172nd-190th Connector completes the connection from SE Foster Road to SE 190th via a new alignment continuing in a northeasterly direction and joining the existing SE 190th alignment immediately south of SE Cheldelin Road.

In conjunction with the new 172nd-190th Connector, SE Tillstrom Road would be realigned beginning at a point approximately 1,200 feet east of SE Foster Road. The realignment entails curving SE Tillstrom Road in a westerly direction and creating a new intersection with SE Foster Road approximately 800 feet (no closer than 600 feet) south of the new 172nd-190th Connector/SE Foster Road intersection.

Similarly, SE 190th Drive would be realigned where it intersects the new 172nd-190th Connector. Beginning at a point approximately 1,200 feet south of SE Cheldelin Road, SE 190th Drive would curve in a northwesterly direction to intersect the new 172nd-190th Connector approximately 800 feet (no closer than 600 feet) south of the 172nd-190th Connector/SE Cheldelin Road intersection.

North of SE Cheldelin Road, SE 190th Drive will be widened symmetrically on both sides to provide a five-lane cross section consistent with the SE 172nd Avenue-190th Drive Connector. As the five-lane expansion extends north of the project study area boundary, the typical cross section may be modified slightly, subject to the requirements of the City of Gresham and the Pleasant Valley District Plan.

5) SE Cheldelin Road: SE 172nd Avenue to SE Foster Road

The conceptual design plan for the SE Foster Road corridor is shown in Figures 7-2A through 7-2C. As demonstrated in the traffic analysis results presented in Section 6, SE Foster Road will function acceptably under projected design year traffic conditions as a three-lane roadway. In this design and per the *Pleasant Valley District Plan*, SE Foster Road will be disconnected to the north beyond SE Cheldelin Road.

Given the multitude of existing and potential future access points along its length, a consistent three-lane cross-section is maintained within the project study area. The design widens SE Foster Road symmetrically on each side of the existing centerline. Ultimately when construction drawings are prepared for the SE Foster Road corridor, it may be appropriate to consider refinements to the design, including possible adjustments to the existing centerline alignment.

6) SE Tillstrom Road

As shown in Figure 7-2A, SE Tillstrom Road will be widened to a three-lane roadway between SE Foster Road and SE Borges Road, with a new roundabout intersection at the realigned SE 190th Drive. Additionally, the western end of the road will be realigned beginning at a point approximately 1,800 feet east of SE Foster Road, in order to separate the SE Tillstrom Road/SE Foster Road intersection by approximately 800 feet (no closer than 600 feet) away from the new 172nd-190th Connector/SE Foster Road intersection. Additionally, SE 190th Drive will be realigned near its southern terminus to form a more perpendicular roundabout intersection with SE Tillstrom Road, as shown in Figure 7-2B.

7) SE Hemrick Road

As a collector roadway, SE Hemrick Road will be widened to urban design standards, including bike lanes and sidewalks. Left-turn lanes may be provided at intersections, depending on future development plans and associated traffic analyses. The cross sectional details of SE Hemrick Road will be based on applicable city and/or county design standards. Figure 7-2B shows a symmetrical widening of SE Hemrick Road about its existing centerline. Extensions to the existing underground culverts will be necessary to provide drainage to the Rock Creek watershed.

8) SE Troge Road

As shown in Figure 7-2C, the Corridor Management Plan includes ~~realigning SE Troge Road beginning approximately 1,000 feet east of SE 172nd Avenue and shifting the SE Troge Road/SE 172nd Avenue intersection approximately 300 feet south of the current intersection location. The purpose of this realignment is twofold: (1) to provide for local circulation to the new frontage road, and (2) to allow the two existing bridges over Rock Creek to be replaced by two single-span bridges. Without the realignment, the structure needed to span Rock Creek would be a complex, three-legged bridge that would cover a large portion of the stream. A new 70-foot long bridge along the western leg of the realigned SE Troge Road will provide access to the future redevelopment of the golf course. widening SE Troge Road to provide a three-lane approach to the intersection with SE 172nd Avenue. To minimize~~

impacting the natural and built environments, the plan retains the existing alignment of SE Troge Road and assumes a future extension of SE Troge Road directly to the west. The widening of SE Troge Road as well as SE 172nd Avenue will involve constructing one long bridge that would follow the existing Rock Creek alignment and span both legs of the intersection. More discussion of the bridge design considerations is provided later in this chapter.

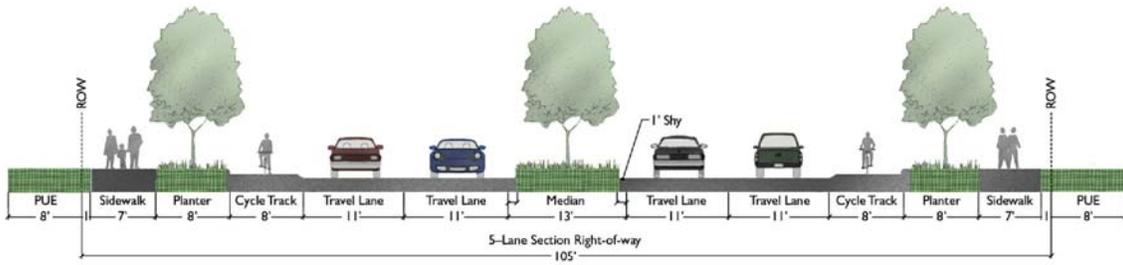
TYPICAL STREETScape SECTIONS

The streetscape characteristics for the SE 172nd Avenue/190th Drive Corridor Management Plan were developed to meet the vehicular travel needs while achieving the other project objectives, including:

- Providing a safe and comfortable route for pedestrians and bicyclists.
- Integrating green street features.
- Supporting future public transit opportunities.
- Encouraging lower speeds within commercial centers.
- Accommodating emergency service vehicles and freight vehicles.
- Providing an aesthetically pleasing design.
- Balancing streetscape features with maintenance considerations.

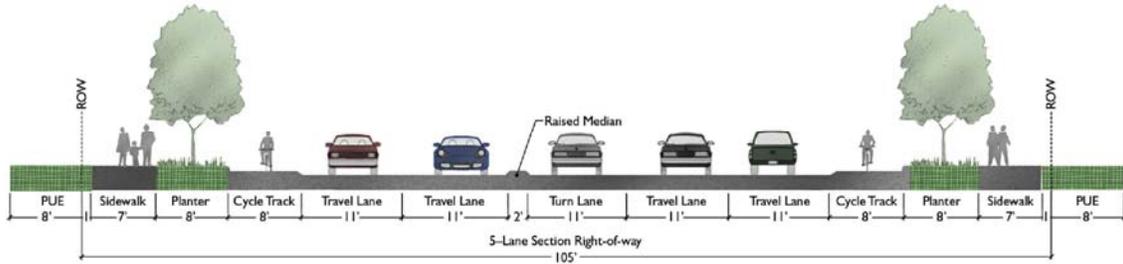
To that end, the streetscape designs shown in Figures 7-3A, 7-3B, and 7-3C were developed for varying lane configuration and land-use environments.

5A-1



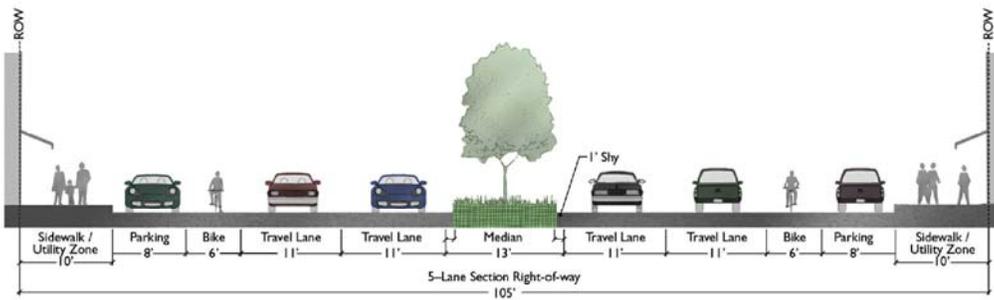
5-Lane Section with Median

5A-2



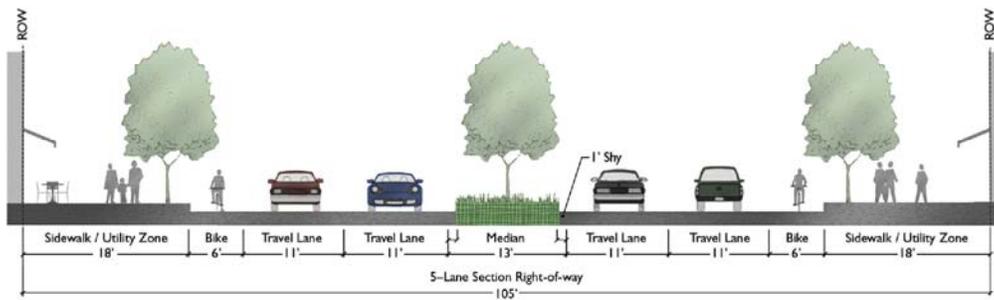
5-Lane Section with Left Turn Lane

5B



5-Lane Section with On-street Parking in Urban Center

5C



5-Lane Section in Urban Center

Corridor Management Plan 5-Lane Streetscape

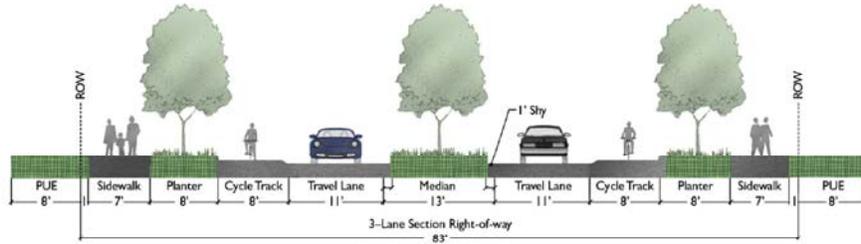


172nd / 190th
Corridor Plan



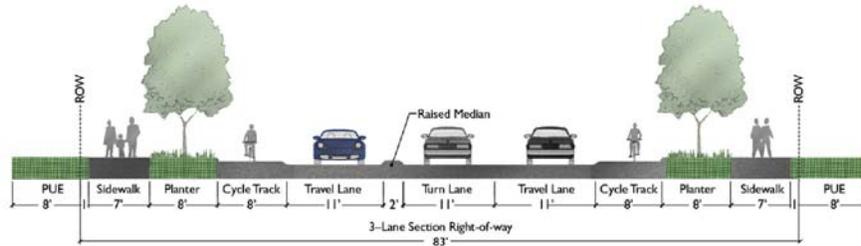
Figure
7-3A

3A-1



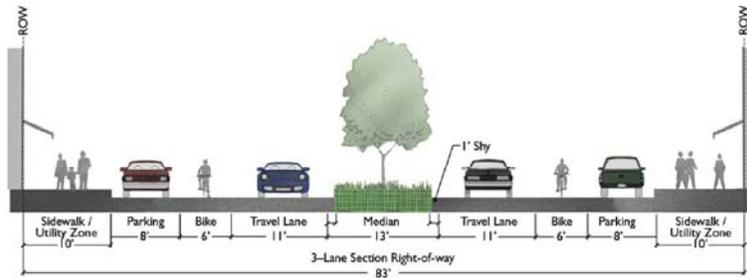
3-Lane Section with Median

3A-2



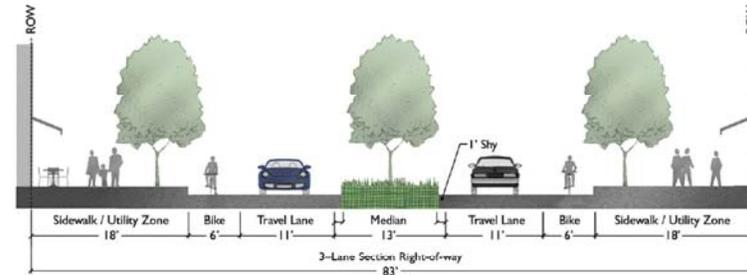
3-Lane Section with Left Turn Lane

3B



3-Lane Section with On-street Parking in Urban Center

3C



3-Lane Section in Urban Center

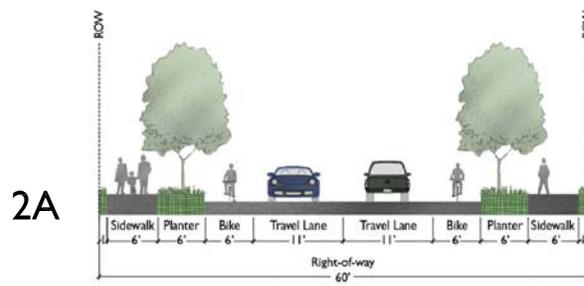
Corridor Management Plan 3-Lane Streetscape



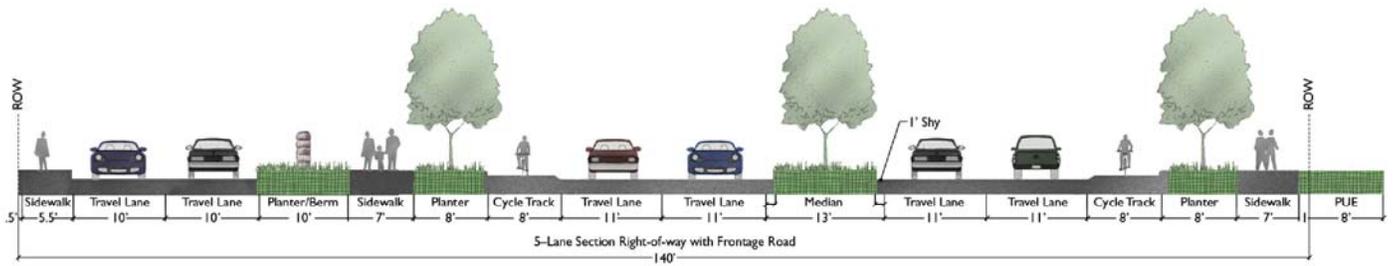
172nd / 190th
Corridor Plan



Figure
7-3B



2-Lane Section



5-Lane Section with Median and Frontage Road

Corridor Management Plan
2-Lane Streetscape



Figure
7-3C

Table 7-2 summarizes the streetscape features and dimensions for various land use environments.

Table 7-2: Corridor Management Plan Streetscape Characteristics and Typical Dimensions

Street Element	Residential or Industrial Areas	Commercial Centers (No Parking)	Commercial Centers with Parking
Vehicle Travel Lane Width	11 feet	11 feet	11 feet
Median Width	13 feet	13 feet	13 feet
Cycle Track Width	8 feet	--	--
Bike Lane Width	--	6 feet	6 feet
Planter Strip Width	8 feet	--	--
Sidewalk Width	7 feet	18 feet	10 feet
Parking	--	--	8 feet
Total ROW – Five-Lane Corridor	105 feet	105 feet	105 feet
Total ROW – Three-Lane Corridor	83 feet	83 feet	83 feet
Five-Lane Corridor Illustration	5A (1 or 2)	5B	5C
Three-Lane Corridor Illustration	3A (1 or 2)	3B	3C
Two-Lane Corridor Illustration	2A	--	--

Additional discussion of the streetscape design elements is provided below.

VEHICLE TRAVEL LANES

Standard lane widths of 11 feet shall be used for the project corridors. These lane widths correspond to the minimum dimension allowed by *Clackamas County Roadway Standards*. Where necessary to accommodate truck turning movements at intersections (especially roundabout intersections), wider travel lanes may be used.

MEDIANS

A consistent median width of 13 feet shall be provided for the 172nd Avenue/190th Drive and SE Foster Road corridors within the PSA. At intersections and access points requiring left-turn lanes, the 13-foot median width can be striped to demarcate an 11-foot left-turn lane with a two-foot median (striped and/or raised) between opposing directions of traffic. For segments between intersections where no left-turn lane is required, a raised landscaped median should generally be provided. The raised median will generally be 11 feet wide, providing one-foot shy distance to the travel lanes on either side.

CYCLE TRACKS

A cycle track is an exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. Although located adjacent to the travel lane (similar to a standard bike lane), cycle tracks on the 172nd Avenue/190th Drive corridor are elevated above the street level using a low-profile curb and a distinctive pavement material. By separating cyclists from motor vehicle traffic, cycle tracks can offer a higher level of security than bike lanes and are attractive to a wider spectrum of the public.



Example cycle track in Bend, Oregon

As shown in Figures 7-3A and 7-3B, cycle tracks shall be eight feet wide, which includes the low-profile curb and shy distance to the vehicular travel lane. The cycle tracks shall be constructed using concrete pavement with coloring to be specified by Clackamas County.

BIKE LANES

For segments of the corridor within commercial centers or on two-lane roadways, the cycle tracks may be eliminated and replaced by standard six-foot bike lanes. In these areas, the two-foot surplus width (in comparison to the eight-foot cycle tracks used elsewhere) will be used to provide wider sidewalks.

PLANTER STRIPS

Planter strips separating the roadway from the sidewalk shall be provided in all areas along the corridor, except within commercial centers. Planter strips will be eight feet wide and may be used to provide water quality treatments and/or other green street design elements.

In commercial centers, planter strips can be eliminated and replaced by wider sidewalks, tree wells, and other street furniture, as shown in Figures 7-3A and 7-3B.

SIDEWALK WIDTH

Sidewalks will generally be at least seven-feet wide for segments of the corridor outside of commercial centers. Within commercial centers, sidewalks will be 18 feet wide where on-street parking is not provided, and 10 feet wide where on-street parking is provided.

PARKING

Parking may be provided within the vicinity of commercial centers. Where provided, parking stalls will be eight feet wide and located between the bike lane and sidewalk, as shown in Figures 7-3A and 7-3B.

RIGHT-OF-WAY WIDTH

As shown in Figures 7-3A and 7-3B, the total required right-of-way width is 105 feet for the five-lane corridor and 83 feet for three-lane corridors. Additionally, an eight-foot public utility easement is required on both sides for all arterial locations, except within the commercial centers where utilities may be provided underground within the right-of-way. Additional slope easements may also be needed outside of the standard right-of-way width, depending on final grading limits. A preliminary assessment of the future right-of-way footprint can be found in the preliminary 15 Percent Design Plans (see *Appendix C*).

INTERSECTION LANE CONFIGURATIONS AND TRAFFIC CONTROL

Traffic analysis results for the 2035 design year were presented in Chapter 6 of this report. Based on the results of the capacity analysis, the lane configurations and traffic control forms were determined for each study intersection. In general, roundabouts were selected as the preferred form for major intersections, if feasible based on the environmental constraints and traffic analysis results. Roundabouts provide several advantages over signalized intersections, including:

- Safety benefits – roundabouts have been shown to have significantly fewer fatal and injury crashes.
- Operational benefits – roundabouts typically have lower overall delay compared to signalized intersections, especially during non-peak travel periods.
- Environmental benefits – roundabouts result in fewer stops and less time idling than signalized intersections.
- Complementary with community values – roundabouts provide opportunities for aesthetic enhancements such as artwork and landscaping. Additionally, roundabouts promote a slower speed environment, which enhances the comfort level for pedestrians, bicyclists, and other non-motorized modes.

At some study intersections, roundabouts were found to require additional travel lanes and/or did not fit well with the surrounding network. In these cases traffic signals were selected as the preferred form

of traffic control. Table 7-3 summarizes the intersection lane configurations and traffic control treatments, as identified in this Corridor Management Plan.

Table 7-3: Summary of Intersection Treatments

Intersection	Proposed Intersection Form
172 nd Ave / Vogel Rd	Signal
172 nd Ave / Troge Rd	Signal
172 nd Ave / Future Scouters Mountain Rd	2-Lane Roundabout
172 nd Ave / Hemrick Rd	2-Lane Roundabout
172 nd Ave / 172 nd -190th Connector	2-Lane Roundabout
172 nd -190th Connector / Foster Rd	2-Lane Roundabout
172 nd -190th Connector / 190 th Ave	2-Lane Roundabout
172 nd -190th Connector / Cheldelin Rd / 190 th Ave	2-Lane Roundabout
172 nd Ave / Sager Rd	1-Lane Roundabout
172 nd Ave / Cheldelin Rd	Signal
Foster Rd / Cheldelin Rd	1-Lane Roundabout
Foster Rd / Tillstrom Rd	Stop Controlled
Foster Rd / Hemrick Rd	1-Lane Roundabout
Foster Rd / Troge Rd	1-Lane Roundabout
190 th / Tillstrom Rd	1-Lane Roundabout

LOCAL ACCESS PLAN

Local access and circulation within the PSA will be accommodated through a combination of new and upgraded collector and local streets. The future network of collector-level roadways is comprised of planned roadways from the City of Happy Valley's *Transportation System Plan* (TSP), the City of Gresham's *Pleasant Valley District Plan*, and a number of additional new roadways from this CORRIDOR MANAGEMENT PLAN. These new collector roadways are shown on the Corridor Management Plan Overview Map in Figure 7-1A and described below.

HAPPY VALLEY TSP

The City of Happy Valley's TSP identifies five existing east-west roadways within the PSA to be extended and upgraded as collector facilities. These roadways are shown schematically in Figure 7-1A and listed as follows:

- SE Baxter Road – to be realigned with SE Clatsop Street and extended from SE 162nd Avenue to SE Foster Road, aligning with SE Cheldelin Road.
- SE Sager Road – to be extended from SE 172nd Avenue to SE Foster Road.
- SE Hemrick Road – to be extended from SE 172nd Avenue to the future extension of SE 162nd Avenue.
- SE Troge Road – to be extended from SE 172nd Avenue to SE 162nd Avenue.
- SE Vogel Road – to be extended from SE 172nd Avenue to SE 162nd Avenue, aligning with SE Misty Drive.

Additionally, the Happy Valley TSP establishes four *new* east-west collector roadways that will cross SE 172nd Avenue within the PSA. These include two new roadways located between SE Sager Road and SE Hemrick Road, the future “Scouters Mountain” roadway between SE Hemrick Road and SE Hagen Road, and a new roadway between SE Troge Road and SE Vogel Road.

Finally, the Happy Valley TSP proposes intermittent north-south connections along the alignment of SE 177th Avenue to be provided between various east-west roadways.

PLEASANT VALLEY DISTRICT PLAN

The City of Gresham’s *Pleasant Valley District Plan* identifies one new collector roadway within the PSA: an extension of SE 182nd Avenue. This future collector would extend from the existing southern terminus of SE 182nd Avenue, follow a portion of the existing SE Richey Road alignment, and connect to SE Cheldelin Road approximately 800 feet east of SE Foster Road.

ADDITIONAL NEW ROADWAYS

This Corridor Management Plan identifies a number of additional collector-level roadways to complete the local circulation network within the PSA. These new roads are shown schematically in Figure 7-1A and described as follows.

- **Future “177th Avenue” Corridor** – The Corridor Management Plan will connect the missing segments of this planned north-south collector corridor from the Happy Valley TSP, to provide a continuous corridor from SE Sager Road to SE Vogel Road. This collector will serve the local circulation needs while SE 172nd Avenue and SE Foster Road will serve more regional travel needs.

- **SE 182nd Avenue Extension** – This new roadway will continue the planned extension of the SE 182nd Avenue corridor (as proposed in the *Pleasant Valley District Plan*) from SE Cheldelin Road south to the future extension of SE Borges Road.
- **SE Sager Road Extension** – The planned extension of SE Sager Road from the Happy Valley TSP will be further extended in an easterly direction from SE Foster Road to the Future SE 182nd Avenue Extension.
- **SE Borges Road Extension** – This improvement would realign the westernmost portion of SE Borges Road to intersect SE Tillstrom Road at a more perpendicular angle. It would then extend the corridor in a westerly direction to the Future “177th Avenue” corridor, aligning with the planned new collector facility as established in the Happy Valley TSP.
- **Future “Scouters Mountain Road” Extension** – The planned new east-west collector from the Happy Valley TSP will be extended eastward from the Future “177th Avenue” to SE Foster Road.

BRIDGE AND CULVERT CONSIDERATIONS

~~Two bridges are~~ One new bridge is designed and included in the plan set and cost estimate. ~~The largest~~ This bridge is located ~~on at the intersection of~~ SE 172nd Avenue ~~south of the existing intersection with~~ and SE Troge Road, crossing Rock Creek. ~~The second bridge is smaller and is located on a new extension of SE Troge Road, immediately west of SE 172nd Avenue. Each~~ The bridge will be a single span structure, straddling the regulated 100-year floodway and will maintain or improve the existing flow capacity. ~~The larger~~ Given the skewed angle of the creek crossing and the need to include two legs of the intersection, the bridge ~~will consist of~~ design assumes precast pre-stressed deck bulb-t girders; ~~the shorter bridge will utilize precast, pre-stressed slabs.~~ Items of note during the final design phase are the high skew angle at the 172nd crossing resulting in a long bridge, and the proximity of the proposed signalized intersection. The construction of the bridge may take at least three stages as it overlaps with both the existing bridge on 172nd Avenue and the existing bridge on Troge Road. To maintain traffic and the required turns, distinct portions of the structure will have to be constructed as well as timed with demolition of the existing bridges.

Scour potential and wildlife corridor crossing will be addressed by raising the bridge and roadway elevation. The proposed roadway typical sections, with the exception of the landscaped planters, will be carried through the bridge segment and appropriate bridge rail will protect pedestrians and bicyclists at the outer edge of the sidewalk. The bridges will accommodate utilities underneath the roadway or sidewalk surface

Two culverts are assumed in this design package: one at a tributary of Rock Creek near the 172nd-190th Connector Road east of the Foster intersection, and one immediately north of the Foster/Hemrick intersection. Each culvert will be a fish-passable box culvert, utilizing either a bottomless structure or a countersunk box. Alternatively, bridges may be used in lieu of culverts, if found to be cost effective. The typical roadway section will be carried through the culvert crossing, with a pedestrian rail at the headwalls to minimize earthwork fill and length of structure. The cost for each structure is provided on an individual basis, and further engineering studies will tighten these costs at the time of final design.

CONSTRUCTION COST ESTIMATE

Planning-level cost estimates were prepared for individual segments of the overall corridor plan using current construction material costs, tax assessor data for property acquisitions, and historical cost data. The major disciplines comprising roadway construction were consulted in preparing estimates: roadway/civil engineering, bridge/structural engineering, stormwater treatment, traffic design, wetland mitigation, and property analysis. For each discipline, an estimate of the materials necessary to complete construction was made. While not comprehensive in scope, the items quantified are intended to define the major construction elements needed to complete the work using a typical engineering design. For example, estimates include a cost per foot of roadway section; features such as landscaped medians or widened road versus new roadway are noted. Aggregated items shown in previous reports have been separated into further detail for ease of tracking costs and isolating construction activities.

The unit costs for construction materials are provided in 2011 dollars and are based upon historic bid tabulation data from the Oregon Department of Transportation (ODOT), estimate work from previous arterial roadway and bridge construction, and other estimating procedures based on project experience and construction cost trends in the region.

Finally, contingencies were included as a percentage of the overall construction cost. Three separate contingencies are noted. Soft costs, set at 30%, account for costs incurred through necessary permitting, plan review fees, additional studies, and design and consultation fees. Construction contingencies, also set at 30%, account for the general level of design detail available upon which to complete the estimate, material price fluctuations, and to cover items not quantified or for which a cost cannot currently be determined. Construction Engineering contingency, set at 10%, is a standard contingency found in both planning projects and those anticipating construction. This contingency covers administration of the construction contract, inspections, and testing services.

Preliminary cost estimates, including contingencies, for each segment of the Corridor Management Plan are shown in Table 7-4.

Table 7-4: Estimated Construction Costs

#	Project	Estimated Cost
1	SE 172nd Avenue (SE Sunnyside Road to SE 172nd-190th Connector)	\$43M
2	SE 172nd Avenue (SE 172nd-190th Connector to SE Cheldelin Road)	\$10M
3	SE 172nd-190th Connector (SE 172nd Avenue to SE Foster Road)	\$10M
4	SE 172nd-190th Connector (SE Foster Road to SE 190th Avenue)	\$18M
5	SE Cheldelin Road (SE 172 nd Ave to SE Foster Rd)	\$5M
6	SE Cheldelin Road (SE Foster Rd to SE 190 th Dr)	\$7M
7	SE Foster Road (SE Cheldelin Rd to SE Troge Rd)	\$28M
8	SE Tillstrom Road (SE Foster Rd to SE Borges Rd)	\$11M
9	SE Hemrick Road (SE 172 nd Ave to SE Foster Rd)	\$8M
10	SE Troge Road (SE 172 nd Ave to approx. 1000' east of SE 172 nd Ave)	\$4M
	GRAND TOTAL	\$144M

Details of the construction cost estimates can be found in *Appendix C*.

OTHER DESIGN CONSIDERATIONS

Retaining Walls

The preliminary design shown on the 15 Percent Design Plans anticipates mechanically-stabilized earth (MSE) retaining walls. Walls of this type consist of a wall panel (typically concrete blocks) tied into the slope using reinforcing materials between compacted soil layers. Retaining walls are proposed in areas where the roadway section requires a cut or fill with a depth over five-feet. Areas with a depth less than five-feet will be graded to catch the existing ground at a 2H:1V slope and may require slope easements.

Relocation of Significant Utilities

Relocation of utilities will generally be a minor task in reconstruction of the roadway network within the PSA. The two utilities that are unlikely to be relocated and shall be considered as fixed in future planning efforts are the 30-inch natural gas pipeline and the overhead electrical transmission lines. Cost and coordination efforts for relocating these items will likely surpass efforts to prepare alternate roadway alignments. Careful design and coordination with these utility providers will be critical when designing the roadway widening of SE 172nd Avenue and the new intersection of Cheldelin and 172nd Avenue for the protection of the gas main and electrical lines.

Several existing electrical lines converge near the widening of SE 172nd Avenue just south of the new intersection with Cheldelin. The final design for the roadway widening should aim to avoid impacting the existing steel towers, but may impact a number of wood pole structures and guy anchors. The crossing of SE 172nd Avenue over the gas line occurs at a 90-degree angle, minimizing the crossing impacts; however, careful protection of the underground pipe will be necessary when compacting the structural section for the widened roadway. Any construction activity across or near the large gas line will likely require a permit from the pipeline owner; coordination is anticipated to require a 6-month lead time. Additionally, the large water main paralleling SE 172nd Avenue from SE Sunnyside Road to SE Troge Road will require careful consideration when altering surrounding roadways and the proposed bridge structure crossing Rock Creek.

Utility Infrastructure

Perhaps more significant than relocation is the opportunity to bring new public infrastructure to the properties within the PSA as the 172nd/190th Corridor Plan develops. While nearly all properties in the PSA are served by electricity and communication utilities, public services such as domestic water, sanitary sewer, and stormwater treatment do not extend north beyond Scouters Mountain School, the most recent development in the PSA. Careful coordination among utility designers will allow for upgrades to existing lines and an opportunity to expand service areas.

In planning the improvements to the roadways, the design team included the cost for new public utilities. These costs, while managed by separate public agencies/jurisdictions, are included to reflect the overall cost for public improvements. This includes stormwater conveyance, detention storage and treatment, sanitary sewer mainlines, and domestic water pipes and appurtenances. Pipe sizing is provided in the cost estimate resulting from general approximations. A detailed engineering study to determine pipe sizing should be performed prior to any construction improvements.

Proposed domestic water infrastructure will likely begin at connection point near Scouters Mountain School. An 18-inch water line exists within SE 172nd from this point south to SE Sunnyside Road. It is estimated that the water main, with an average pipe diameter of 12 inches, will be extended throughout the project on all improved streets. Appurtenances including hydrants, air release valves, valves at intersections, and service connections are estimated at 10% of the mainline cost. Reservoir improvements, pressure release valves, booster pumps or the like are not included in the design and estimate at this phase.

The cost estimate includes line items for proposed sanitary sewer infrastructure to connect the majority of the PSA properties which utilize septic tanks and drain fields. An existing sanitary sewer

trunk line runs up the Rock Creek corridor from SE Sunnyside Road to SE Troge Road, then continues up SE 172nd Avenue to Scouters Mountain School. For all other road improvements, new sanitary lines are provided in the estimate. Using the roadway lengths, 8 and 12-inch sanitary lines are estimated, with the 8-inch lines serving the roadways at the high points – generally from the northeast corner of the PSA running downhill to the southwest corner at the connection point near Rock Creek.

The stormwater conveyance system proposed at this level of design considers the contributing area for roadway improvements only, not future developments. Per Clackamas County Stormwater Management Guidelines, new developments are required to detain and treat stormwater onsite prior to releasing the water to a public system or stream. Depending on timing of property developments, a parallel stormwater sewer system serving adjacent property developments may be constructed within the right-of-way before outfalling to the nearest body of water. Pipe sizing for the stormwater system results from general approximations to convey the roadway runoff. The stormwater pipe sizes were estimated using the CIA method to relate required pipe sizes to contributing impervious area:

- 12-inch pipe for contributing areas less than 5 acres,
- 18-inch pipe for contributing areas between 5 and 15 acres, and
- 24-inch pipe for contributing areas over 15 acres.

Other utility infrastructure that may be incorporated as the roadway network develops may include natural gas, telecommunications, ITS technology for traffic management, and electricity. Each roadway is planned for an eight-foot public utility easement (PUE) on each side of the proposed roadway. This area will serve the private utility companies, providing a space for an underground joint trench and vaults or for placement of poles for aerial utilities. The space was reserved, but the cost to supply and install the infrastructure is not included in the cost estimates, with the exception of conduit for ITS infrastructure.

Drainage Constraints

Designers will need to provide for water quality treatment and detention for all runoff from new or redeveloped impervious area, utilizing vegetated treatment facilities where appropriate. Soils appear to have relatively low permeabilities and on-site testing will be necessary to assess how well any proposed infiltration facilities will drain. Clackamas County WES requires infiltration of the first 0.5 inches of runoff, detention for a range of storm events, and water quality treatment for all runoff from new or redeveloped impervious area. Infiltration rates will depend upon numerous factors including the soil characteristics and the depth to groundwater. Many of the suggested pond sites are in relatively low areas and may be impacted by the seasonal water tables found in those areas

Planning for right-of-way acquisition and roadway design will consider the area required for stormwater treatment facilities such as swales and planters adjacent to roads.

Water Quality Treatment

Clackamas County has placed a high priority on using vegetative treatment of runoff water. These facilities utilize infiltration of water and are most cost effective if underdrains are not required. On-site infiltration tests will be required to assist in choosing the type of water quality treatment system to be applied to different sections of the project. For the contributing roadway surface area, treatments for managing stormwater runoff may include a variety of options such as linear swales and rain gardens located at low positions within the eight-foot landscape strip within the roadways rights of way.

Regional Detention Facilities

Opportunities for developing regional detention facilities beyond the project boundaries should be evaluated. These could serve the proposed SE 172nd Avenue/190th Drive Corridor Management Plan as well as other privately-owned properties needing detention. As an interim design, 17 smaller detention ponds are sized and located throughout the PSA to collect runoff from the roadway surface only. Future development could increase the size and number of detention ponds, whose size and location must be determined through a separate analysis. The right-of-way needed for the ponds is shown on the 15 Percent Design Plans and provided in the estimate.

Appendix A

MAPS AND DOCUMENTS ADOPTED BY REFERENCE

The following maps and documents have been adopted by reference to the Comprehensive Plan. These documents are available for review at the Clackamas County Planning and Zoning Division.

NATURAL RESOURCES AND ENERGY

Habitat Conservation Area Maps

Water Quality Resource Area Maps

Board Order 2014-14 (In the Matter of a Comprehensive Plan Amendment, Zone Map Amendment, and Site Plan Review request from Tonquin Holdings, LLC, on property described as T3S R1W Section 04A, Tax Lots 100 and 102) and All Attachments

TRANSPORTATION

Clackamas County Pedestrian Master Plan

Clackamas County Bicycle Master Plan

Clackamas County Airport Plan

SE 172nd Avenue/ 190th Drive Corridor Management Plan, ~~December 2011R~~
February 2012; Revised April 2016 (adopted 2/9/2012; 6/15/2016)

Clackamas County Active Transportation Plan, June 1, 2015

COMMUNITY AND DESIGN PLANS, Clackamas Regional Center Area Design Plan

Phillips Creek Greenway Framework Plan

Clackamas Regional Center Pedestrian/Bicycle Plan

ORDINANCE NO. 494
CITY OF HAPPY VALLEY

AN ORDINANCE AMENDING THE CITY'S COMPREHENSIVE PLAN SPECIFIC TO THE ADOPTION OF AN UPDATE TO THE 172ND AVENUE/190TH DRIVE CORRIDOR MANAGEMENT PLAN ("172ND PLAN") AND, DECLARING AN EMERGENCY.

WHEREAS, the City provided legal notice that the City's Planning Commission and City Council would consider the proposed Comprehensive Plan Amendments; and

WHEREAS, the proposed 172nd Plan Update is more accurate for current/future transportation planning efforts and has been coordinated on between communications from City staff to Clackamas County Department of Transportation and Development (DTD) staff; and

WHEREAS, the proposed 172nd Plan Update is timely due to development interests in the 172nd Avenue/Troge Road intersection area; and

WHEREAS, the City Council considered the proposed amendments at its regularly scheduled City Council meeting on May 3, 2016; and

Now, therefore, based on the foregoing,

THE CITY OF HAPPY VALLEY ORDAINS AS FOLLOWS:

Section 1. The City of Happy Valley declares that the 172nd Plan be updated and that City staff provide County staff with all associated materials to provide for "mirrored" updates.

Section 2. The City Council adopts the subject amendments (Exhibit A) and the associated Staff Report to the Planning Commission and Exhibits dated April 12, 2016 (Exhibit B).

Section 4. The Planning Official is directed to:

1. Amend the 172nd Plan within the City's Comprehensive Plan.
2. Said changes shall become effective immediately upon adoption of this Ordinance.

COUNCIL APPROVAL AND UNANIMOUS ADOPTION AT ONE MEETING: [May 3, 2016]


Lori DeRemer
Mayor

Adoption and date attested by:


Marylee Walden
City Recorder



**CITY OF HAPPY VALLEY
PLANNING COMMISSION HEARING
AGENDA**

**April 12, 2016
7:00 p.m.**

7:00 P.M. CALL TO ORDER

1. CONSENT AGENDA

- A. Minutes Dated November 10, 2015
- B. Minutes Dated December 8, 2015
- C. Minutes Dated January 12, 2016
- D. Minutes Dated February 9, 2016
- E. Minutes Dated March 8, 2016

2. CUP-01-15 THE GREEN PLANET MEDICAL MARIJUANA DISTRIBUTION FACILITY

Continued from March 8, 2016

3. CPA-02-16/LDC-02-16 COMPREHENSIVE PLAN/ZONING MAP AMENDMENT

The applicant, Gramor, Inc. seeks a Comprehensive Plan/Zoning Map Amendment to change the subject property, located at the southeast corner of 157th Avenue and Misty Drive, from its existing comprehensive plan designation/zoning district of Mixed Use Commercial (MUC) to a comprehensive plan/designation/zoning district of Mixed Use Residential – Multifamily (MUR-M2), in order to develop multifamily housing, through a separate Design Review application, on the subject property.

4. CPA-04-16 COMPREHENSIVE PLAN AMENDMENT SPECIFIC TO AN UPDATE OF THE 172ND /190TH CORRIDOR MANAGEMENT PLAN

After the adoption of the original 172nd Avenue/190th Drive Corridor Management Plan in 2012, it was discovered that a key alignment through the Beall Family properties (former Pleasant Valley Golf Course) and Troge Road were severely impacted by a much larger than anticipated wetland being located along the south side of Troge Road. This challenge was discovered during the proposal and subsequent approval of “Rock Creek Meadows”.

5. COMMISSIONERS CONCERNS AND COMMENT

6. ADJOURNMENT



**CITY OF HAPPY VALLEY
STAFF REPORT TO THE PLANNING COMMISSION**

APRIL 12, 2016

**COMPREHENSIVE PLAN AMENDMENT SPECIFIC TO AN UPDATE OF THE 172nd
AVENUE/190th DRIVE CORRIDOR MANAGEMENT PLAN**

FILE NO. CPA-04-16

I. GENERAL INFORMATION:

APPLICABLE CRITERIA:

Applicable Statewide Planning Goals; applicable Oregon Administrative Rule (OAR) sections; and, applicable Sections of Title 16 (Development Code) of the City of Happy Valley Municipal Code.

EXHIBITS:

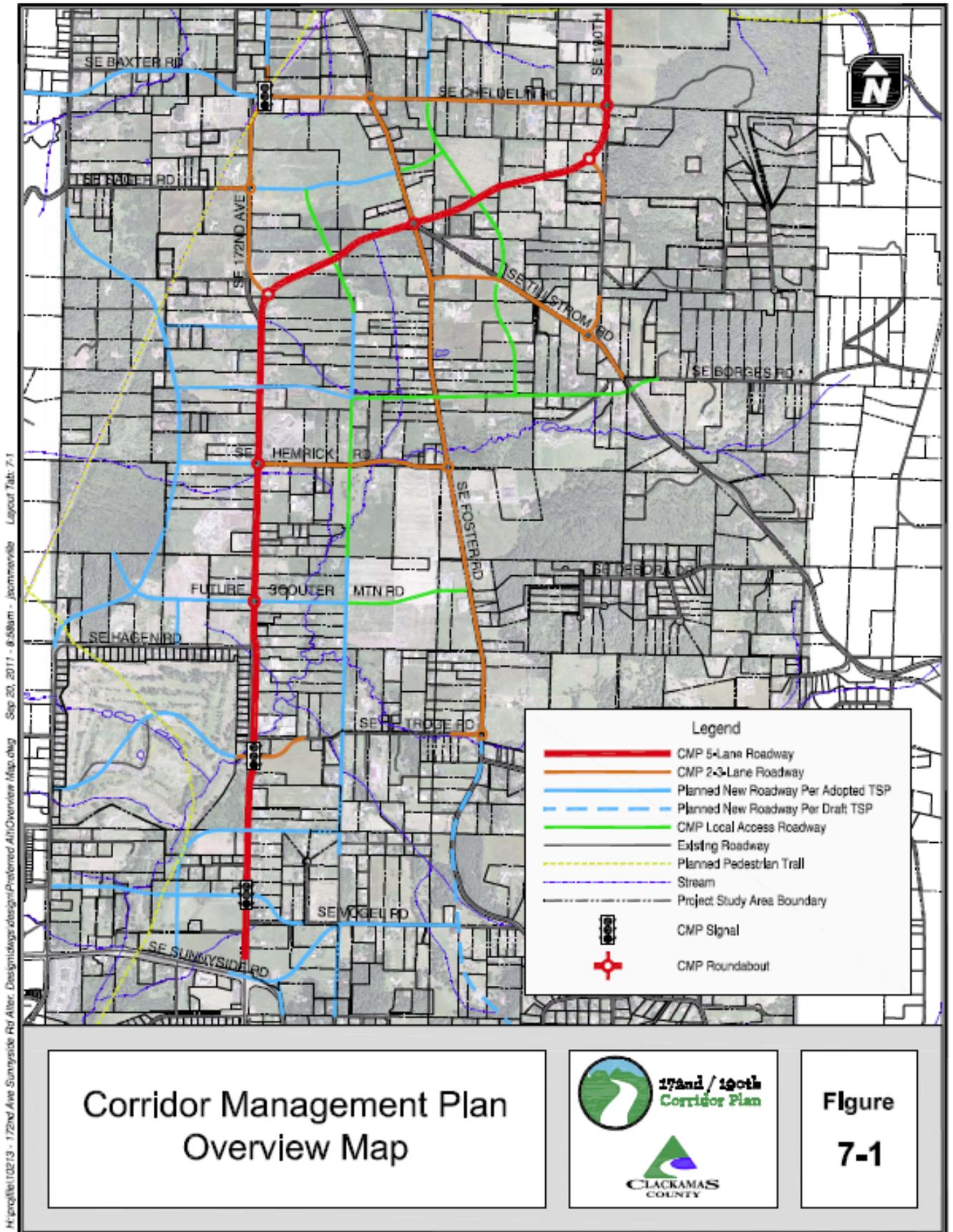
- A. Staff Report and Findings of Fact
- B. 172nd Avenue/190th Drive Corridor Management Plan Update (Final Memo)
- C. Published Notice

BACKGROUND:

After the adoption of the original 172nd Avenue/190th Drive Corridor Management Plan (“172nd Plan”) in 2012, it was discovered that a key alignment (the east-west Collector Facility going from 162nd Avenue to 172nd Avenue through the Beall Family properties (former Pleasant Valley Golf Course) and Troge Road (see the blue and orange lines with a signal symbol just south of Troge Road in Figure 7.1 below), were severely impacted by a much larger than anticipated wetland being located along the south side of Troge Road (where the re-aligned road was proposed to exist). This challenge was discovered during the proposal and subsequent approval

16000 SE Misty Drive, Happy Valley, Oregon 97086-4288
Telephone: (503) 783-3800 Fax: (503) 658-5174
happyvalleyor.gov

of “Rock Creek Meadows”, a 127-lot PUD located just east of 172nd Avenue and south of Troge Road. During that approval, staff proposed that rather than having the applicant be conditioned to build the Collector Facility through the approximately five-acre wetland, that the wetland preservation take precedence and that a 172nd Plan Update be explored. That exploration is encapsulated within Exhibit B.



Corridor Management Plan Overview Map



**Figure
 7-1**

AGENCY AND INTERESTED PERSONS COMMENTS

Notification and materials were delivered to the Oregon Department of Land Conservation and Development (DLCD), the required 35 days prior to this initial evidentiary hearing. In addition, notice and materials were sent to the regional government (Metro) and other affected public and private agencies, including Clackamas County Dept. of Transportation and Development (DTD). As of the date this report was written, no communications had been received.

II. RECOMMENDATION

The proposed 172nd Plan Update details the existing alignment and three alternatives (Concept 1, 2 and 2A). In addition, the report contains Attachment A (Natural Resources Analysis) and Attachment B (Constructability and Cost Analysis). Within these documents, the various costs and benefits of the revised alignment options are explored. Due to the combination of factors found within these reports, coupled with the fact that the Beall Family Properties (that are being analyzed for a future Master Plan/PUD) has ownership of land that is directly across (west of) Troge Road, staff recommends that the Planning Commission forward a recommendation of approval of CPA-04-16 based on Concept 2 to the City Council.

III. FINDINGS OF FACT

1. The following Statewide Planning Goals are applicable to the subject request:

“Goal 1 (Citizen Involvement)

To develop a citizen involvement program that ensures the opportunity for citizens to be involved in all phases of the planning process.

Staff Response:

Statewide Planning Goal 1 requires governing bodies charged with preparing and adopting a comprehensive plan to adopt and publicize a program for citizen involvement that clearly defines the procedures by which the general public will be involved. Clackamas County facilitated extensive amounts of public involvement in regard to the original 172nd Plan, including an entire Public Involvement Process. The changes explored here involve a relatively minor amendment to the greater 172nd Plan. In addition, the City of Happy Valley has noticed the 172nd Plan amendments hearings before the Planning Commission and City Council via published notice (see Exhibit C). Therefore, this criterion has been satisfied by the citizen involvement process centered on the proposed 172nd Plan Update.

[...]

Goal 12 (Transportation)

To provide and encourage a safe, convenient and economic transportation system.”

Staff Response:

The intent of Goal 12 is “to provide and encourage a safe, convenient, and economic transportation system.” The very purpose of the proposed 172nd Plan Update is to provide and

encourage a safer, more convenient and economic transportation system for the public. Therefore, this criterion has been satisfied by the proposed amendments.

2. The following Oregon Administrative Rules (OAR) are applicable to the subject request:

“OAR Chapter 660, Division 12 (Transportation Planning)

660-012-0060

Plan and Land Use Regulation Amendments

[...]

(2) If a local government determines that there would be a significant effect, then the local government must ensure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility measured at the end of the planning period identified in the adopted TSP through one or a combination of the remedies listed in (a) through (c) below, unless the amendment meets the balancing test in subsection (2)(e) of this section or qualifies for partial mitigation in section (11) of this rule. A local government using subsection (2)(e), section (3), section (10) or section (11) to approve an amendment recognizes that additional motor vehicle traffic congestion may result and that other facility providers would not be expected to provide additional capacity for motor vehicles in response to this congestion.

(a) Adopting measures that demonstrate allowed land uses are consistent with the planned function, capacity, and performance standards of the transportation facility.

(b) Amending the TSP or comprehensive plan to provide transportation facilities, improvements or services adequate to support the proposed land uses consistent with the requirements of this division; such amendments shall include a funding plan or mechanism consistent with section (4) or include an amendment to the transportation finance plan so that the facility, improvement, or service will be provided by the end of the planning period.

(c) Amending the TSP to modify the planned function, capacity or performance standards of the transportation facility.

(d) Providing other measures as a condition of development or through a development agreement or similar funding method, including, but not limited to, transportation system management measures or minor transportation improvements. Local governments shall, as part of the amendment, specify when measures or improvements provided pursuant to this subsection will be provided.

(e). Providing improvements that would benefit modes other than the significantly affected mode, improvements to facilities other than the significantly affected facility, or improvements at other locations, if the provider of the significantly affected facility provides a written statement that the system-wide benefits are sufficient to balance the significant effect, even though the improvements would not result in consistency for all performance standards.”

Staff Response:

The proposed 172nd Plan Update does not include any Comprehensive Plan/Zoning Map amendments – existing Comprehensive Plan designations/zoning districts along the corridor are consistent with the identified function, capacity, and performance standards of the facilities identified as demonstrated within the City’s TSP and thus meet the “balancing test” delineated within subsection (2)(e). Further, the proposed 172nd Plan Update includes changes aimed at

fulfilling the City's transportation policies and the requirements of the Transportation Planning Rule (TPR). Therefore, these criteria are satisfied by the proposed amendments.

3. The following sections of the Metro Regional Transportation Plan (RTP) – 2010 are applicable to the subject request:

“[...]

2.5.1 Regional System Design and Placemaking Concept, including Figure 2.10 and Table 2.6:

Staff Response:

The proposed 172nd Plan Update is consistent with this section of the RTP due to the fact that proposed design elements in the 172nd Plan are consistent with the Regional Street design classification. A Regional Street is typically a major arterial with four travel lanes, a turning lane, bike lanes and sidewalks. That is, in the Happy Valley portion of the greater plan area, the 172nd Ave./190th Drive Connector are identified as Major Arterials, include designs for pedestrians, bicyclists and transit users, and fit the general definition of Regional Streets. Therefore, these criteria are satisfied by the proposed amendments.

2.5.2 Arterial and Throughway Network:

Policy 1. Build a well-connected network of “complete” streets that prioritize safe and convenient pedestrian and bicycle access

Policy 2. Improve local and collector street connectivity

Staff Response:

The proposed 172nd Plan Update is consistent with this section of the RTP due to the fact that the proposed roadway facilities would add connections both for regional and local use in this area and provide new bicycle and pedestrian facilities on roads with limited current opportunities for these modes and will assist in the development of a well-connected network of complete streets and improve local and collector street connectivity. Therefore, these criteria are satisfied by the proposed amendments.

2.5.4 Regional Freight Network:

Policy 1. Use a systems approach to plan for and manage the freight network.

Policy 2. Reduce delay and increase reliability.

Staff Response:

The proposed 172nd Plan Update is consistent with this section of the RTP due to the fact that the 172nd Ave./190th Drive Connector is designated as a Roadway Connector on the Regional Freight Network in this section of the RTP. A Roadway Connector is a designated freight route that connects freight facilities to main roadway routes. In addition, the development of the preferred roadway alignment included consideration of freight, which will serve existing and future employment/industrial lands. Also, the connection of 172nd Ave to 190th Dr. will add a more direct north/south connection to reduce delay and increase reliability for freight travel between Highway 212 and US 26 and I-84. Therefore, these criteria are satisfied by the proposed amendments.

2.5.5 Regional Bicycle Network:

Policy 1. Provide an interconnected network of bicycle facilities that provides seamless access to 2040 target areas.

Policy 2. Improve bike-transit connections.

Staff Response:

The proposed 172nd Plan Update is consistent with this section of the RTP due to the fact that the 172nd Ave./190th Drive Connector is designated as a Community Bikeway and Foster Road is designated as a Regional Bikeway on the Regional Bicycle Network in this section of the RTP. Both designations are bikeways that directly connect regional destinations and/or attractions. The proposed roadway designs will provide exclusive bicycle facilities along both the 172nd Ave./190th Dr. Connector corridor and Foster Road that will connect to regional destinations and/or other regional bicycle facilities. The proposed roadway facilities will also add bicycle facilities to these roads, which are expected to provide transit service in the future. Therefore, these criteria are satisfied by the proposed amendments.

2.5.6 Regional Pedestrian Network:

Policy 1. Promote walking as a primary mode for short trips.

Policy 2. Build a well-connected network of pedestrian facilities that serves all ages and abilities.

Policy 3. Improve pedestrian-transit connections”

Staff Response:

The proposed 172nd Plan Update is consistent with this section of the RTP due to the fact that the 172nd Ave./190th Drive Connector and Foster Road are designated as Mixed-use Corridors on the Regional Pedestrian Network in this section of the RTP. Mixed-use Corridors are identified as priority areas for pedestrian improvements in the region. The future roadway facilities will add pedestrian facilities to several arterials and local roads that currently do not have pedestrian facilities and which are expected to provide transit service in the future. Therefore, these criteria are satisfied by the proposed amendments.

4. The following sections of Title 16 of the Happy Valley Municipal Code (DEVELOPMENT CODE) are applicable to this request:

“Chapter 16.67 COMPREHENSIVE PLAN MAP, SPECIFIC AREA PLANS, LAND USE DISTRICT MAP AND TEXT AMENDMENTS

[...]

16.67.015 Initiation of a plan amendment.

A. Any change in the text, map or implementing ordinances of adopted Happy Valley land use regulations may be initiated by the City [...]

16.67.020 Legislative amendments.

Legislative amendments are policy decisions made by City Council. Except in the case of expedited annexation, they are reviewed using the Type IV procedure in Section 16.61.050 and shall conform to the Transportation Planning Rule provisions in Section 16.67.060, as applicable.”

Staff Response:

The proposed 172nd Plan Update is initiated by the City and has been processed as legislative amendments through a Type IV process. Therefore, these criteria have been satisfied by the proposed amendments.



TECHNICAL MEMORANDUM

SE 172nd Avenue/SE 190th Drive Corridor Management Plan Amendment

SE Troge Road/SE 172nd Avenue Intersection Realignment Analysis

Date: March 4, 2016

Project #:18766

To: Michael Walter

From: Wade Scarbrough, PE; Marc Butorac, PE; and Stefan Bussey

This memorandum summarizes the design and evaluation of a proposed amendment to the *SE 172nd Avenue/190th Drive Corridor Management Plan* (Reference 1, hereafter referred to as the *Corridor Management Plan*). Specifically, the proposed amendment considers changing the planned location and alignment of SE Troge Road at its intersection with SE 172nd Avenue. Kittelson & Associates, Inc. (KAI), together with project team partners OTAK and Mason Bruce & Girard (MB&G), has evaluated the proposed amendment concept with respect to the project evaluation criteria established in the Corridor Management Plan. The remainder of this memorandum describes the proposed amendment concepts, the evaluation results, and recommended next steps.

BACKGROUND

The Corridor Management Plan was finalized in February, 2012 and later adopted by both the City of Happy Valley and Clackamas County. The plan establishes an alignment and cross-section for approximately three miles of new/improved roadway connecting from the SE 172nd Avenue/SE Sunnyside Road intersection on the south end to the SE 190th Drive/SE Cheldelin Road intersection on the north end. Within the vicinity of the SE Troge Road intersection, the plan calls for SE Troge Road to be realigned approximately 300 feet south of its current alignment to form a new signalized intersection at SE 172nd Avenue. The plan also calls for extending SE Troge Road to the west, allowing for a connection to the future redevelopment of the Pleasant Valley Golf Course.

Recent development activities in this vicinity have revealed the presence of wetlands within the vicinity of the SE Troge Road realignment. These wetland areas were not known at the time the original plan was developed. This study, therefore, considers several revised concepts for the alignment of SE Troge Road with the intent of minimizing impacts to the known wetland areas.

PROJECT STUDY AREA

The project study area includes the intersection of SE 172nd Avenue and SE Troge Road and the planned realignment and extension of SE Troge Road, from approximately 1,000 feet east of SE 172nd Avenue to approximately 500 feet west of SE 172nd Avenue.

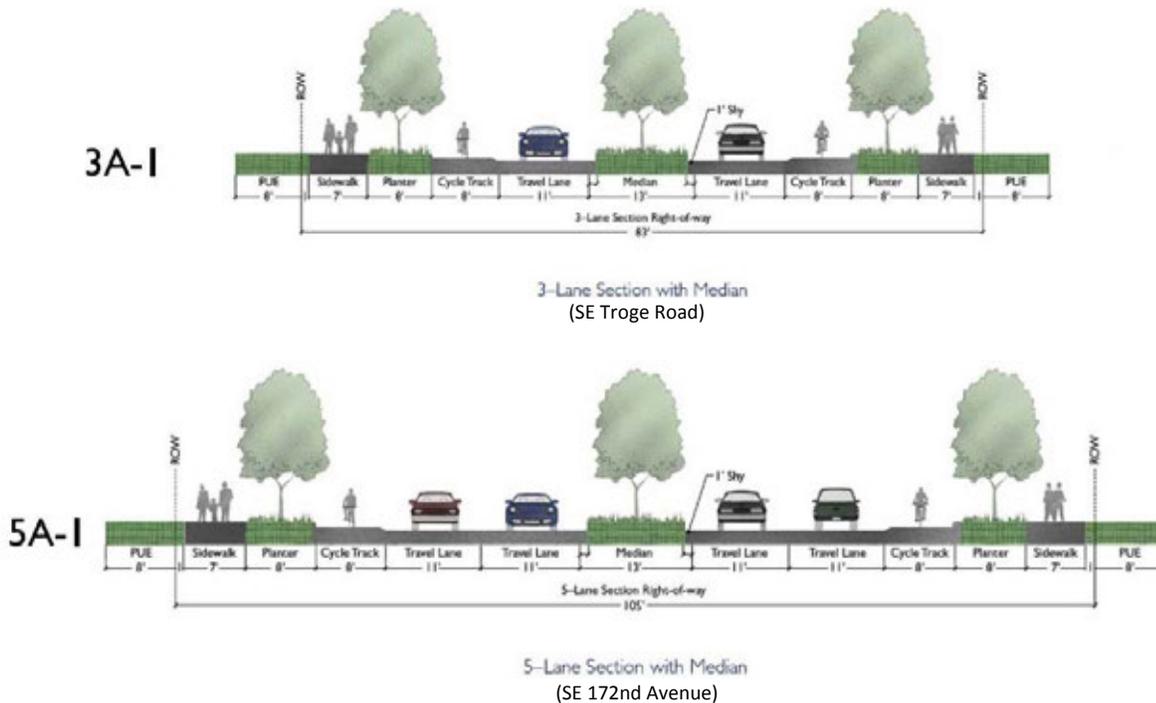
PLANNED ROADWAY CROSS SECTIONS

All revised concepts presented below would retain the core streetscape characteristics identified in the adopted Corridor Management Plan. In summary, these cross sections address vehicular travel needs as well as the following project objectives:

- Provide safe and comfortable routes for cyclists and pedestrians;
- Integrate green street features;
- Support future public transit opportunities
- Encourage lower speeds in commercial centers;
- Accommodate emergency services and freight vehicles;
- Provide an aesthetically pleasing design; and
- Balance streetscape features with maintenance considerations.

The planned cross section along SE 172nd Avenue within the vicinity of SE Troge Road is comprised of a five-lane roadway with a raised center median (or left-turn lane, where needed), two travel lanes in each direction, eight-foot wide cycle tracks, planter strips, and sidewalks. The planned cross-section for SE Troge Road is a three-lane cross-section featuring a raised center median (or left-turn lane, where needed), one travel lane in each direction, eight-foot wide cycle tracks, planter strips, and sidewalks. The two cross sections from the adopted corridor management plan are depicted below in Exhibit 1.

Exhibit 1: SE 172nd Avenue and SE Troge Road Cross Sections



ALIGNMENT ALTERNATIVES

KAI investigated a total of four alignment alternatives as part of this study. The first alternative is the alignment from currently-adopted plan, which is known as Concept AT-2 based on the nomenclature developed during the original alternatives development process. KAI developed two potential revision concepts for the SE Troge Road/SE 172nd Avenue intersection. Labeled as Revision Concept 1 and Revision Concept 2, these two concepts would maintain SE Troge Road on its existing alignment and consider slightly different alignments for SE 172nd Avenue. Lastly, the project team identified a potential variation of Revision Concept 2, which has been labeled Revision Concept 2A.

The four concepts under review are depicted in Figures 1 – 4. A brief description of each concept is provided below.

Concept AT2 (Current Adopted Alignment)

Concept AT2 (shown in Figure 1) is the layout from the adopted Corridor Management Plan. It realigns SE Troge Road approximately 300 feet to the south of the existing intersection and shifts SE 172nd Avenue approximately 50 feet east of its present centerline alignment. A new frontage road would provide access to the existing residential properties on the west side of SE 172nd Avenue between SE Hagen Road and SE Troge Road. The frontage road would connect to the SE Troge Road Extension approximately 200 feet west of SE 172nd Avenue.

The adopted Corridor Management Plan had proposed realigning SE Troge Road for two primary reasons:

1. It simplifies the bridge construction. Relocating the intersection allows for the construction of two separate bridges over Rock Creek, rather than one large bridge spanning diagonally across the intersection.
2. It provides space for the proposed frontage road to outlet to the new SE Troge Road Extension.

Revision Concept 1

Revision Concept 1 (Figure 2) retains the existing alignment of SE Troge Road and assumes a future extension of SE Troge Road directly to the west. The concept also retains the existing centerline alignment of SE 172nd Avenue through the Troge Road intersection and begins the proposed realignment approximately 100' north of Troge Road. As shown in Figure 2, this concept has substantial impacts to four existing lots on the northwest corner of SE 172nd Avenue/SE Troge Road. After initially reviewing this concept, both the City of Happy Valley and Clackamas County have **eliminated this concept from further consideration**, due to its impacts to numerous existing residential properties as compared to Revision Concept 2 (described below).

Revision Concept 2

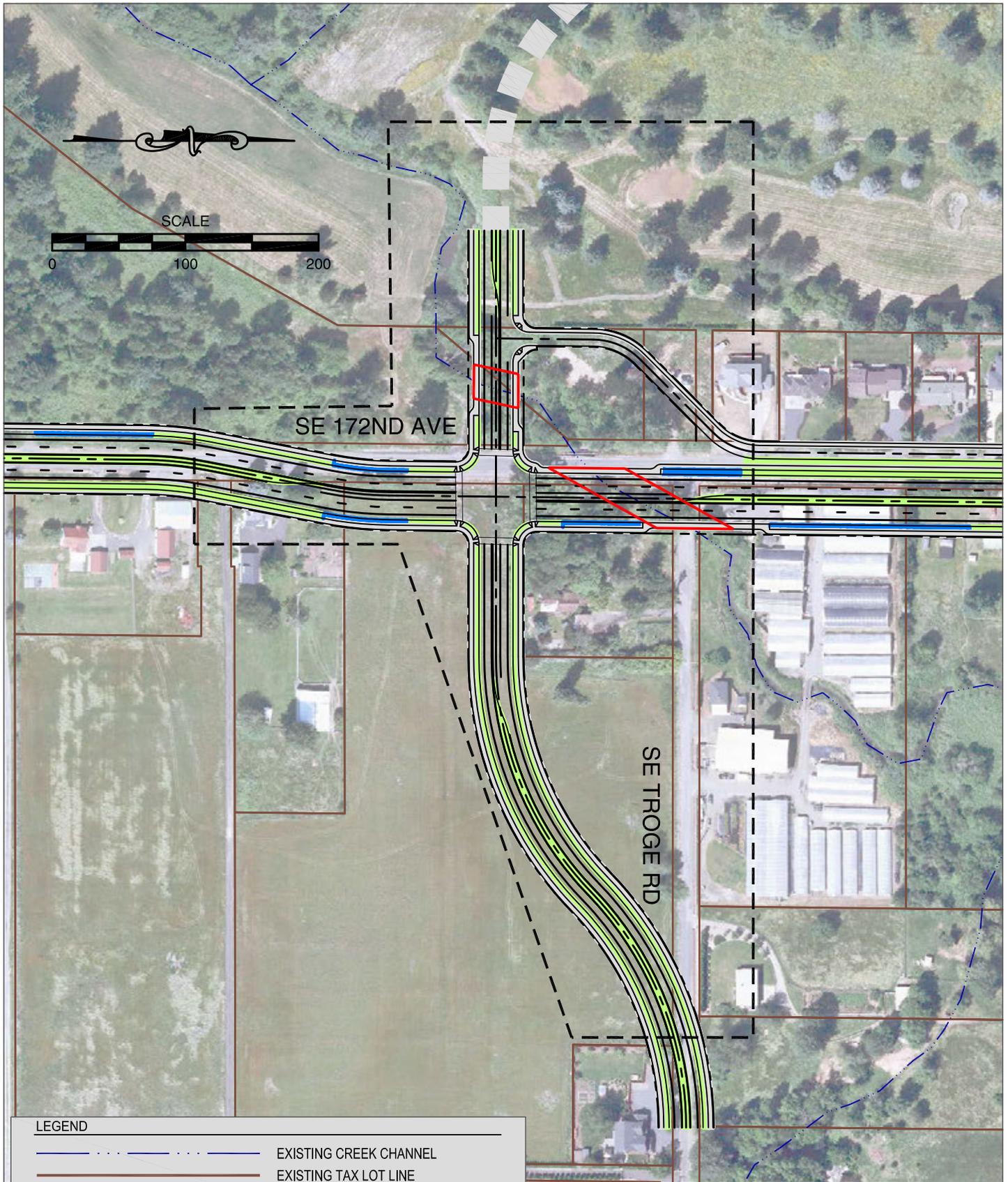
Revision Concept 2 (Figure 3) retains the existing alignment of SE Troge Road on the east side of SE 172nd Avenue and assumes a future extension of SE Troge Road directly to the west. The realignment of SE 172nd Avenue begins south of the SE Troge Road intersection to reduce the impacts to the existing properties on the northwest corner. Similar to the previous concepts, a frontage road would provide access to the residential properties on the west side of SE 172nd Avenue. However, in this concept the frontage road would not have an outlet to SE Troge Road, and thus the only outlet would be to SE Hagen Road¹. As shown in the Corridor Management Plan, a future roadway connection between SE Hagen Road and Future Scouter Mountain Road would provide the connection to SE 172nd Avenue.

As shown on Figure 3, this alignment alternative will involve constructing one long bridge that would follow the existing Rock Creek alignment and cut diagonally across the entire intersection.

Revision Concept 2A

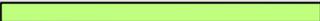
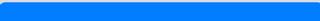
Revision Concept 2A (Figure 4) would provide the same roadway configuration as Concept 2, but it would include realigning Rock Creek in order to simplify the bridge configuration and reduce construction cost. As depicted in Figure 4, this concept would result in two shorter span bridges, one on each road, to facilitate the crossing of the realigned creek.

¹ Note: an emergency access route would likely be provided at the end of the cul-de-sac.



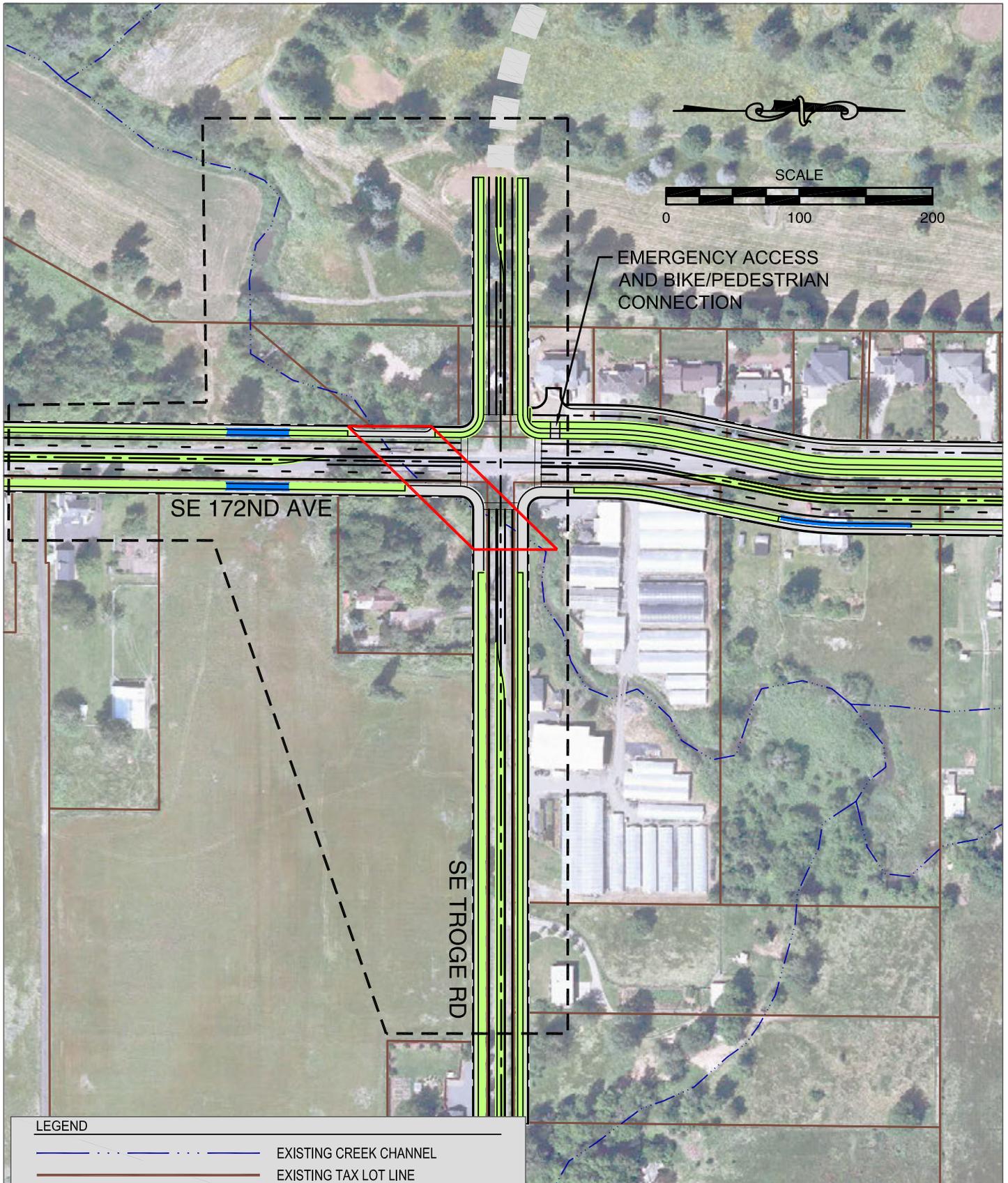
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LEGEND

-  EXISTING CREEK CHANNEL
-  EXISTING TAX LOT LINE
-  PROPOSED BRIDGE
-  PROPOSED PLANTER / MEDIAN
-  PROPOSED STORMWATER FACILITY
-  STUDY AREA

Adopted Corridor Plan
(Concept AT2)

Figure
1



EMERGENCY ACCESS
AND BIKE/PEDESTRIAN
CONNECTION

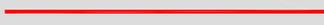
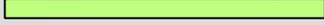
SCALE

0 100 200

SE 172ND AVE

SE TROGE RD

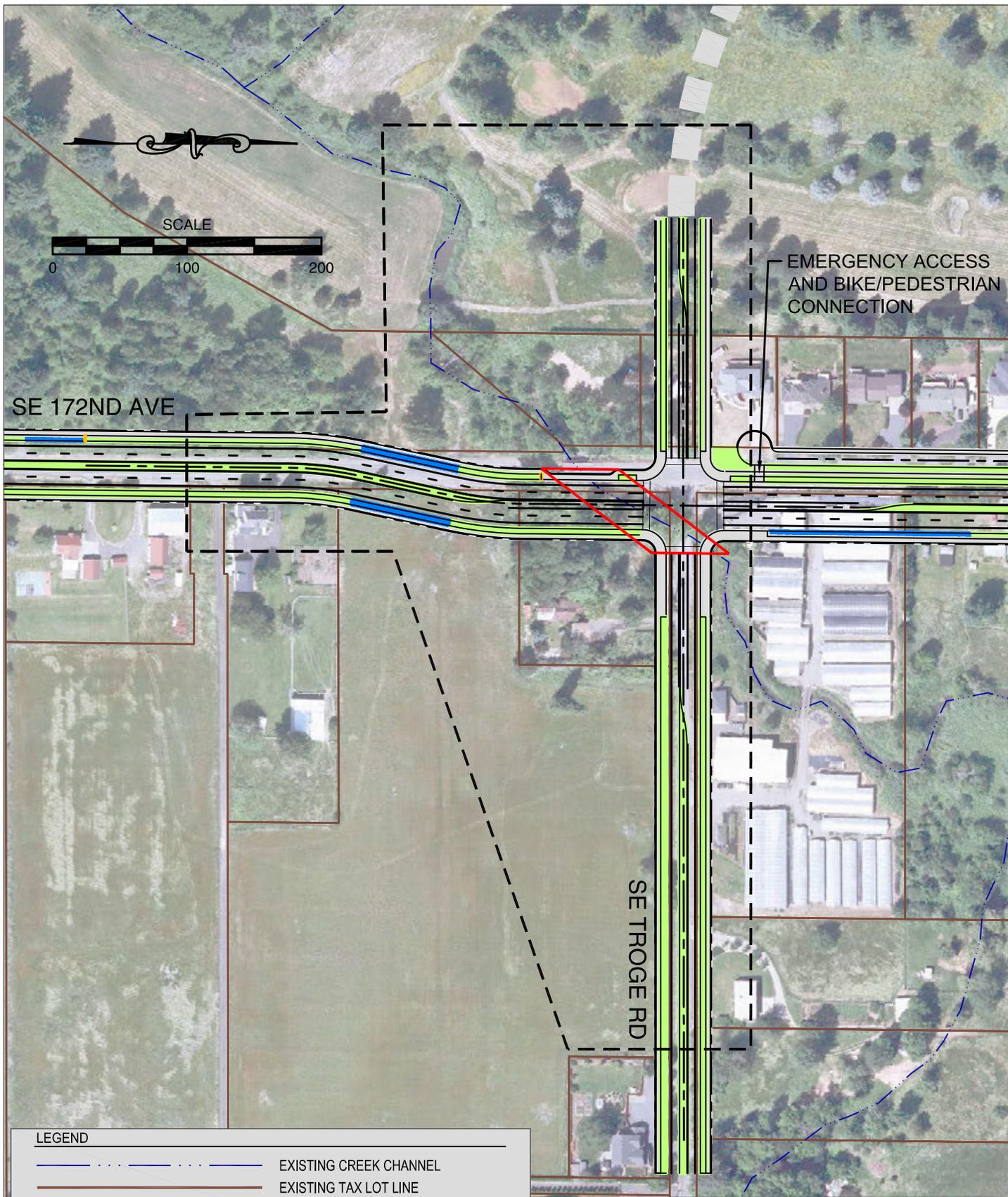
LEGEND

-  EXISTING CREEK CHANNEL
-  EXISTING TAX LOT LINE
-  PROPOSED BRIDGE
-  PROPOSED PLANTER / MEDIAN
-  PROPOSED STORMWATER FACILITY
-  STUDY AREA

Revision Concept 1

Figure
2

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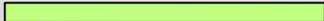
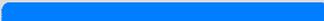


EMERGENCY ACCESS AND BIKE/PEDESTRIAN CONNECTION

SE 172ND AVE

SE TROGE RD

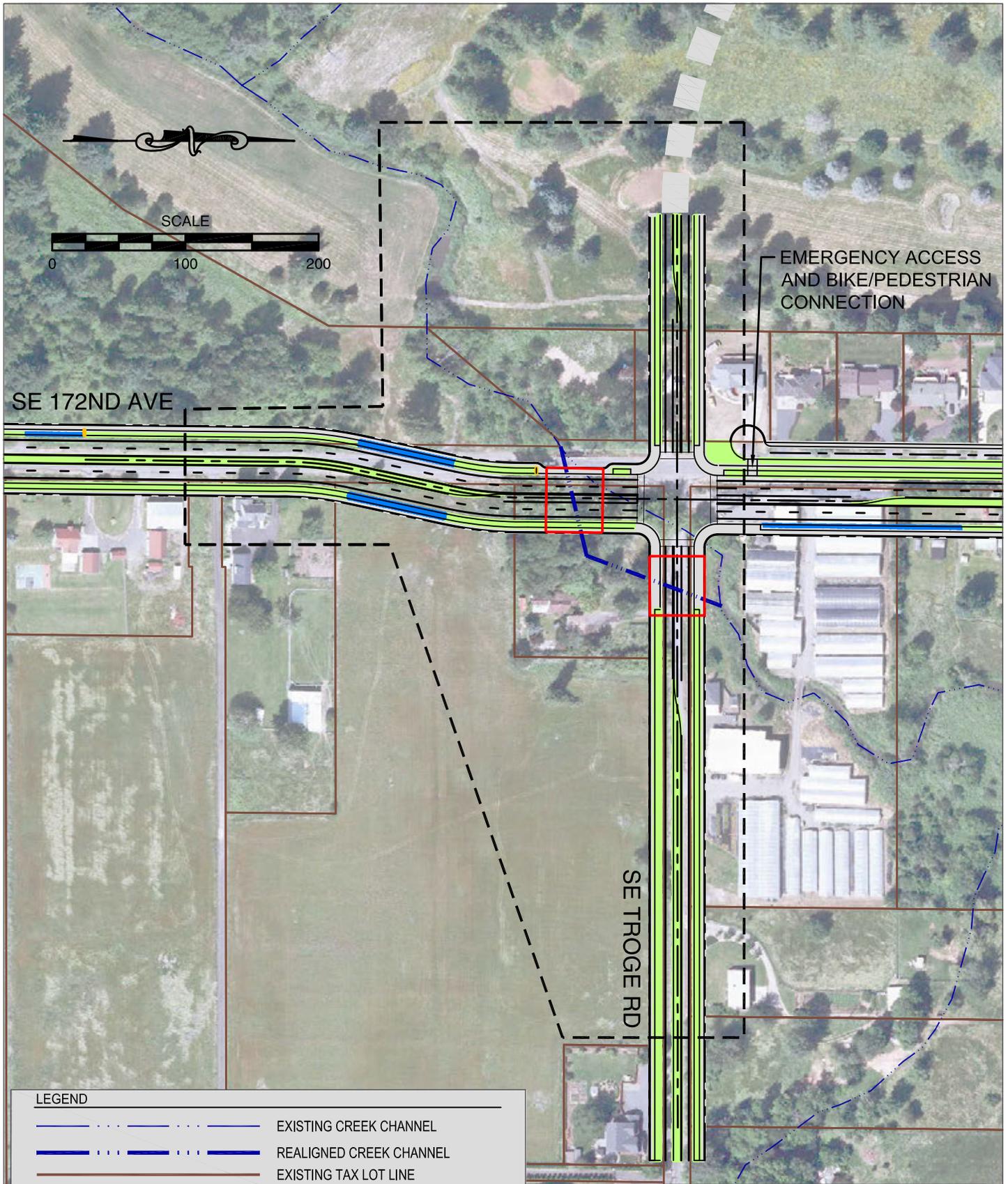
LEGEND

-  EXISTING CREEK CHANNEL
-  EXISTING TAX LOT LINE
-  PROPOSED BRIDGE
-  PROPOSED PLANTER / MEDIAN
-  PROPOSED STORMWATER FACILITY
-  STUDY AREA

Revision Concept 2

Figure 3

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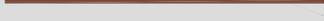
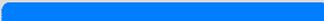


EMERGENCY ACCESS AND BIKE/PEDESTRIAN CONNECTION

SE 172ND AVE

SE TROGE RD

LEGEND

-  EXISTING CREEK CHANNEL
-  REALIGNED CREEK CHANNEL
-  EXISTING TAX LOT LINE
-  PROPOSED BRIDGE
-  PROPOSED PLANTER / MEDIAN
-  PROPOSED STORMWATER FACILITY
-  STUDY AREA

Revision Concept 2A

Figure 4

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CONCEPT EVALUATION

The project team applied the evaluation criteria from the Corridor Management Plan to evaluate the proposed revision concepts. These criteria are summarized below in Table 1. Those criteria highlighted in gray were reviewed and found to be addressed equally by all three concepts. As such, these criteria do not play a factor in differentiating between concepts. The remaining criteria (i.e. those not shaded in the table below) are the key criteria that were used to compare and assess the revision concepts.

Table 1: Evaluation Criteria

CRITERIA	PROJECT OBJECTIVES	NOTES
Vehicular Mobility	<ul style="list-style-type: none"> Provide an efficient north-south connection Accommodate vehicles entering from the east and west 	All concepts provide equivalent capacity, connectivity, and travel speed.
Multi-Modal Mobility	<ul style="list-style-type: none"> Enhance travel distance and comfort of pedestrians and bicyclists Provide connections to trails and other multi-modal facilities Minimize grade increases and decreases 	All concepts provide similar facilities for non-automotive modes.
Local Access	<ul style="list-style-type: none"> Maintain or enhance access to neighborhoods, businesses, and public facilities Provide efficient access for future development 	See scorings in next section.
Multi-Modal Safety	<ul style="list-style-type: none"> Improve safety and comfort for all users, especially non-auto travelers Improve emergency response time Provide flat terrain and intersections without skewed angles 	All concepts provide similar facilities for non-automotive modes. The geometry and intersection control is equivalent in all concepts.
Impacts to Natural Environment	<ul style="list-style-type: none"> Minimize impacts to streams, wetlands, riparian areas, wildlife habitats, open spaces, and other natural resources Minimize stream crossings Minimize new pavement and encroachments on area buttes 	See scorings in next section.
Impacts to Built Environment	<ul style="list-style-type: none"> Minimize right-of-way impacts on existing and future development Minimize socio-economic and cultural resource impacts Minimize noise/air impacts Minimize hazardous waste sites 	See scorings in next section.
Land Use Compatibility	<ul style="list-style-type: none"> Provide consistency with plans and standards of Clackamas County, Damascus, Happy Valley, Gresham, Metro, and special districts Provide connections to proposed future retail and residential developments 	All concepts are similarly compatible with the land uses in the study area.
Flexibility of Implementation	<ul style="list-style-type: none"> Accommodate phased construction Accommodate expansion concurrent with development needs 	All concepts provide a similar level of flexibility.
Cost	<ul style="list-style-type: none"> Provide positive economic benefits compared to costs Provide high overall value 	See scorings in next section.
Aesthetic Character	<ul style="list-style-type: none"> Enhance potential visual character of the corridor Provide aesthetic elements such as landscaping Preserve the rural character of the corridor 	All concepts will provide the same streetscape features and character.
Environmental Enhancement	<ul style="list-style-type: none"> Minimize environmental impact of street footprint Provide green street features 	All concepts will provide the same footprint and green street features.
Maintenance	<ul style="list-style-type: none"> Minimize on-going maintenance and upkeep, including drainage systems, pavement, and landscaping 	Maintenance needs (including structures) are expected to be similar for all concepts.
Functionality	<ul style="list-style-type: none"> Effectively serve role as a major arterial Provide efficient movements for all travel modes 	All concepts provide equivalent level of functionality and efficiency.

The project team evaluated each of the two revision concepts plus the original concept with respect to the above criteria using information obtained from site visits, topographical survey, aerial photography, GIS-based data, and the previous environmental baseline reports (Reference 1). A detailed assessment

of the natural resources within the conceptual design area was conducted by MB&G and is documented in a separate memorandum, which is contained in Attachment “A.” Additionally, OTAK conducted a comparative assessment of construction costs, right-of-way costs, and constructability issues; this work is documented in a separate memorandum contained in Attachment “B.”

Consistent with the methodology used in the Corridor Management Plan, a numeric scoring system was applied to assess each concept with respect to the criteria. Each alignment concept was assigned a +1 score (good), zero score (fair/neutral), or -1 score (poor) depending on how the concept does, or does not, meet each of the specific evaluation considerations. These ratings were then averaged to determine a total average score for that criterion. Concepts receiving the highest numeric value are those that best meet the criteria.

Tables 2 through 7, in the following sections, display the evaluation results for each of the criteria.

Local Access

The *local access* criterion assesses vehicular access to the neighborhoods, businesses, and public facilities along the corridor and within the study area. Concepts that preserve or enhance access to existing uses as well as provide efficient access to future land uses scored highly in this category.

Table 2 summarizes the evaluation scores for the local access criterion and provides notes with justification for each score.

Table 2: Local Access

LOCAL ACCESS CONSIDERATIONS	AT2	2	2A
Maintain or enhance access to existing neighborhoods, businesses, and public facilities	0	-1	-1
Provide efficient access for future development	+1	+1	+1
AVERAGE SCORE	+0.5	0	0

CONCEPT	LOCAL ACCESS CONSIDERATIONS	SCORE	NOTES
AT2	Maintain or enhance access to existing neighborhoods, businesses, and public facilities	0	Maintains access for the existing properties along the west side of SE 172nd Avenue via the frontage road, which is connected to both SE Hagen Road and SE Troge Road.
	Provide efficient access for future development	+1	Provides future signalized access for redevelopment of the Pleasant Valley golf course property.
2	Maintain or enhance access to existing neighborhoods, businesses, and public facilities	-1	Frontage Road would be connected only to SE Hagen Road, no connection to SE Troge Road.
	Provide efficient access for future development	+1	Provides future signalized access for redevelopment of the Pleasant Valley golf course property.
2A	Maintain or enhance access to existing neighborhoods, businesses, and public facilities	-1	Frontage Road would be connected only to SE Hagen Road, no connection to SE Troge Road.
	Provide efficient access for future development	+1	Provides future signalized access for redevelopment of the Pleasant Valley golf course property.

Impacts to Natural Environment

Evaluating impacts to natural resources focused on assessing the impact of each roadway concept on the existing wetlands and streams within the project study area. Details of the natural resources assessment are summarized in the MB&G Memorandum, contained in Attachment “A.”

Table 3 summarizes the evaluation scores for the natural environment criterion and provides notes with justification for each score.

Table 3: Impacts to the Natural Environment

IMPACTS TO NATURAL ENVIRONMENT CONSIDERATIONS	AT2	2	2A
Minimize impacts to Wetlands A and B	-1	+1	+1
Minimize impacts to Wetlands C	-1	+1	+1
Minimize impacts to Wetlands D	-1	+1	+1
Minimize impacts to Rock Creek	+1	+1	-1
Minimize Rock Creek crossings	-1	+1	-1
AVERAGE SCORE	-0.6	+1	+0.2

CONCEPT	IMPACTS TO NATURAL ENVIRONMENT CONSIDERATIONS	SCORE	NOTES
AT2	Minimize impacts to Wetlands A and B	-1	Concept AT2 will significantly impact Wetland A and Wetland B of which Wetland B has been identified as locally significant.
	Minimize impacts to Wetlands C	-1	Concept AT2 will impact comparatively more of Wetlands C (Beall Property and Rock Creek terrace).
	Minimize impacts to Wetlands D	-1	Concept AT2 will impact comparatively more of Wetlands D (wetlands on both sides of SE 172nd Avenue).
	Minimize impacts to Rock Creek	+1	Concept AT2 does not involve realigning Rock Creek.
	Minimize Rock Creek crossings	-1	This concept includes two new stream crossings over Rock Creek.
2	Minimize impacts to Wetlands A and B	+1	Based on the desktop review and MB&G field reconnaissance, Concepts C2 will only require sliver impacts to Wetland A and Wetland B in order to widen SE Troge Road and realign SE 172nd Avenue.
	Minimize impacts to Wetlands C	+1	Concept 2 will impact comparatively less of Wetlands C (Beall Property only).
	Minimize impacts to Wetlands D	+1	Concept 2 will impact comparatively less of Wetlands D (only wetlands east of SE 172nd Avenue).
	Minimize impacts to Rock Creek	+1	Concept 2 does not involve realigning Rock Creek.
	Minimize Rock Creek crossings	+1	This concept includes one new stream crossing over Rock Creek.
2A	Minimize impacts to Wetlands A and B	+1	Based on the desktop review and MB&G field reconnaissance, Concepts C2A will only require sliver impacts to Wetland A and Wetland B in order to widen SE Troge Road and realign SE 172nd Avenue.
	Minimize impacts to Wetlands C	+1	Concept 2A will impact comparatively less of Wetlands C (Beall Property only).
	Minimize impacts to Wetlands D	+1	Concept 2A will impact comparatively less of Wetlands D (only wetlands east of SE 172nd Avenue).
	Minimize impacts to Rock Creek	-1	Concept 2A does involve realigning Rock Creek.
	Minimize Rock Creek crossings	-1	This concept includes two new stream crossings over Rock Creek.

Impacts to the Built Environment

This criterion evaluates the impacts of the proposed roadway expansion on existing and future development in the study area, including property acquisition requirements, socio-economic impacts, cultural resources, and hazardous waste sites. There are no known cultural resources or hazardous waste sites within the project study area (Reference 1); therefore, this assessment of revision concepts focuses entirely on right-of-way acquisition impacts.

Table 4 summarizes the evaluation scores for the impacts to the built environment criterion and provides notes with justification for each score.

Table 4: Impacts to the Built Environment

IMPACTS TO BUILT ENVIRONMENT CONSIDERATIONS	AT2	2	2A
AVERAGE SCORE	-1	+1	+1

CONCEPT	IMPACTS TO BUILT ENVIRONMENT CONSIDERATIONS	SCORE	NOTES
AT2	Minimize right-of-way impacts on existing and future development	-1	Requires significant additional right-of-way for the realignment of SE Troge Road, including property currently under development.
2	Minimize right-of-way impacts on existing and future development	+1	Requires relatively minor additional right-of-way for the widening of SE Troge Road. Right-of-Way could be dedicated as part of redevelopment.
2A	Minimize right-of-way impacts on existing and future development	+1	Requires relatively minor additional right-of-way for the widening of SE Troge Road. Right-of-Way could be dedicated as part of redevelopment.

Cost

The cost criterion evaluates the relative overall magnitude of design and construction costs, including engineering, roadway construction, structures, and maintenance of traffic. For this assessment of the potential revision concepts, the cost analysis was broken down into three key elements that will contribute to differences in costs between the concepts: bridge construction, environmental mitigation, and right-of-way acquisition. The OTAK memorandum, contained in Attachment “B,” provides a more in-depth comparative analysis of the anticipated costs associated with each alternative.

Table 5 summarizes the evaluation scores for the cost criterion and provides notes with justification for each score.

Table 5: Cost

IMPACTS TO BUILT ENVIRONMENT CONSIDERATIONS	AT2	2	2A
AVERAGE SCORE	0	0	+1

CONCEPT	COST CONSIDERATIONS	SCORE	NOTES
AT2	Consider cost differences associated with bridges and structures, environmental mitigations, and right-of-way acquisition	0	This concept has a moderate cost compared to other concepts. Total cost for bridges, environmental mitigations, and right-of-way is estimated to be approximately \$4.3M.
2	Consider cost differences associated with bridges and structures, environmental mitigations, and right-of-way acquisition	0	This concept has a moderate cost compared to other concepts. Total cost for bridges, environmental mitigations, and right-of-way is estimated to be approximately \$4.5M.
2A	Consider cost differences associated with bridges and structures, environmental mitigations, and right-of-way acquisition	+1	This concept has the lowest cost compared to other concepts. Total cost for bridges, environmental mitigations, and right-of-way is estimated to be approximately \$3.8M.

Summary of Scores

Table 6 provides the overall scoring results for the three alternatives. Within each box is the average score shown in previous tables.

Table 6: Summary of Alternative Evaluation Scores

EVALUATION CRITERIA	AT2	2	2A
Vehicular Mobility	0	0	0
Multi-Modal Mobility	0	0	0
Local Access	+0.5	0	0
Multi-Modal Safety	0	0	0
Impacts to Natural Environment	-0.6	+1.0	+0.2
Impacts to Built Environment	-1.0	+1.0	+1.0
Land Use Compatibility	0	0	0
Flexibility of Implementation	0	0	0
Cost	0	0	+1
Aesthetic Character	0	0	0
Environmental Enhancement	0	0	0
Maintenance	0	0	0
Functionality	0	0	0
TOTAL SCORE	-1.1	+2.0	+2.2

CONCLUSIONS AND RECOMMENDATIONS

Upon review of the total scores for each of the alternatives, the project team finds that Revision Concepts 2 and 2A provide a more advantageous alignment configuration than that of the currently adopted Corridor Management Plan. As noted above, Revision Concept 2 would provide appreciably fewer impacts to both the natural environment and the built environment within the project study area. For these reasons, the project team recommends that the Corridor Management Plan be revised to reflect the roadway alignments shown in Revision Concept 2.

NEXT STEPS

The information presented in this technical memorandum should be presented and reviewed by the appropriate staff and officials of the City of Happy Valley and Clackamas County. Pending the concurrence of the both agencies, the Corridor Management Plan should then be amended to reflect the revised roadway alignments at the SW 172nd Avenue/SE Troge Road intersection. The following is a list of exhibits, tables, and text from the Corridor Management Plan that should be revised:

- Figure 7-1A (Corridor Management Plan Overview Map)
- Figure 7-1B (Corridor Management Plan Overview Map)
- Table 7-1 (Summary of Corridor Management Plan Roadway Improvements)
- Figure 7-2C (Corridor Management Plan Improvements (Sheet 3 of 4))
- Figure 7-2D (Corridor Management Plan Improvements (Sheet 4 of 4))
- Text page 7-11 (description of SE Troge Road realignment)

REFERENCES

1. Clackamas County. *SE 172nd Avenue/190th Drive Corridor Management Plan*. Prepared by Kittelson & Associates, Inc. February 2012.

ATTACHMENTS

- A. Mason, Bruce & Girard Memorandum: Environmental Analysis
- B. OTAK Memorandum: Constructability and Cost Analysis Memorandum

Attachment A
Mason, Bruce & Girard Memorandum:
Natural Resources Analysis

MEMORANDUM

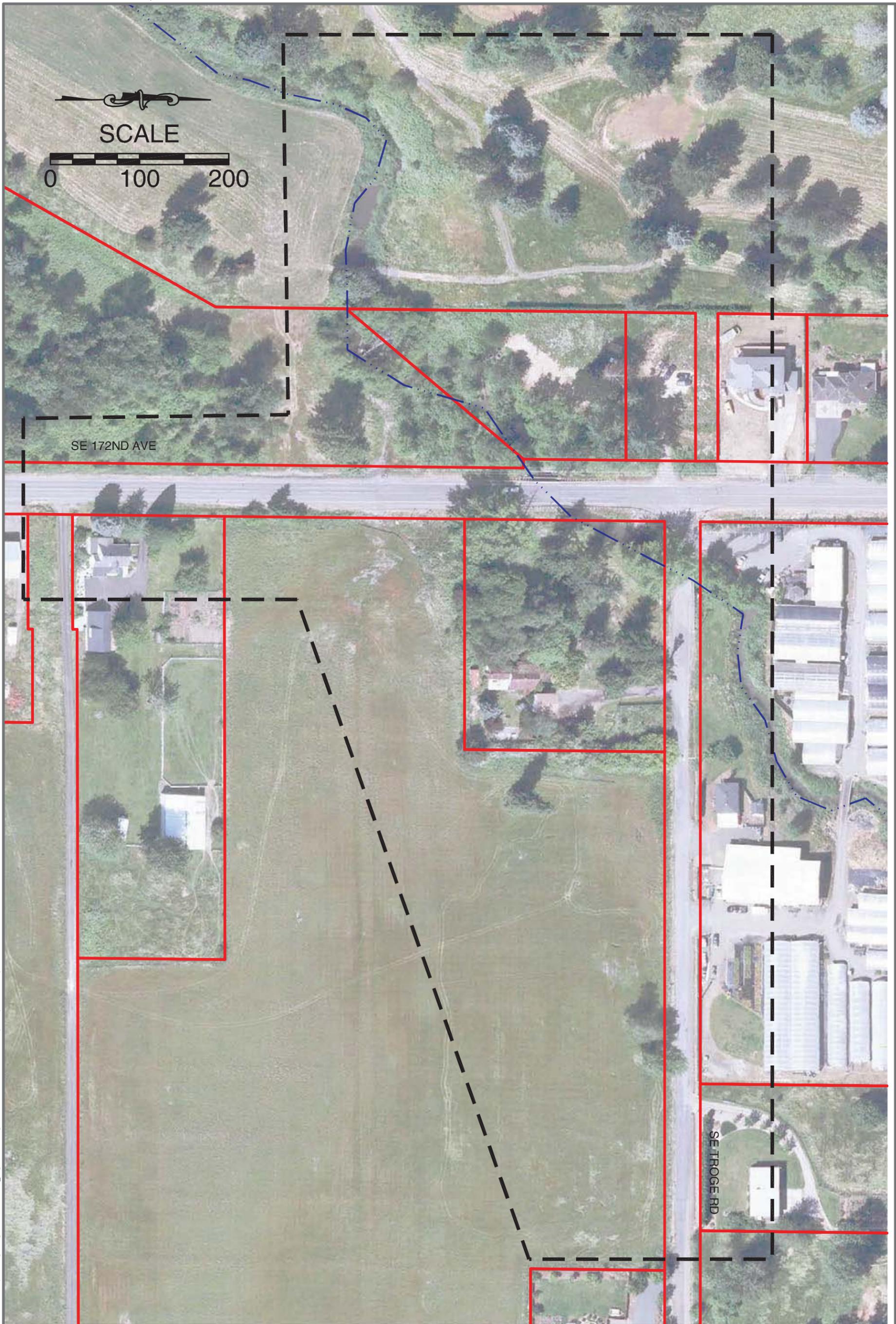
DATE: January 15, 2016
TO: Wade Scarbrough, Kittelson & Associates, Inc.
FROM: Alexis Casey, Biologist, Mason, Bruce & Girard Inc. (MB&G)
SUBJECT: Field Summary Reconnaissance Memo for the 172nd / 190th Corridor Plan Update

1.0 INTRODUCTION

The purpose of the original 172nd/190th Corridor Plan Project (Corridor Plan Project) was to address congestion and existing safety problems within the 172nd/190th Corridor Plan Project Study Area (Corridor Plan PSA); serve future north-south traffic demand; serve expected growth in Damascus, Happy Valley, and Gresham; and serve the growing demand for regional travel. The 172nd/190th Corridor Update Project (Corridor Plan Update Project) addresses the City of Happy Valley's (City's) request for a revision to the conceptual roadway improvements identified in the Corridor Plan PSA along SE 172nd Avenue near SE Troge Road.

The purpose of this summary memorandum is to document natural resources within three conceptual design areas within the 172nd/190th Corridor Plan Update Project Study Area (Corridor Plan Update PSA) (Figure 1). These natural resources were identified during a desktop review of existing documentation and a field reconnaissance. This information will be used by the project team to guide the design alternative selection process in the Corridor Plan Update PSA to ensure that impacts to natural resources are avoided and/or minimized to the extent possible.

The Corridor Plan Update PSA has been developed to encompass all potential areas that may be improved for the three proposed design concepts for the 172nd Avenue/SE Troge Road intersection. Figure 2 and Figure 3(a-c), which are located in Appendix A, include detailed depictions of each conceptual design. The previously-adopted concept (AT2 Alignment) for the Corridor Plan Project includes the realignment of SE Troge Road approximately 300 feet to the south of the existing intersection and the realignment of SE 172nd Avenue approximately 80 feet to the east of its existing location (Figure 3a). As part of the Corridor Plan Update, the Concept 2 Alignment includes widening SE Troge Road in its existing alignment and realignment of SE 172nd Avenue approximately 80 feet to the east of its existing location (Figure 3b). The Concept 2A Alignment (Figure 3c) is similar to Concept 2 except that the proposal includes realigning Rock Creek to the south and east in order to eliminate the need for one long bridge over the creek, which results in the need for two smaller bridges over Rock Creek.



Study Area

Existing Conditions
Happy Valley, OR

Figure
1

H:\proj\8\18766-172nd-190th Corridor Plan Update\dwg\design\pers\15543\230_Original 11x17.dwg Nov 19, 2015 - 9:21am - sbussey Layout Tab: Study Area - EX Conditions

2.0 METHODS

Mason, Bruce & Girard (MB&G) Biologists (Alexis Casey and Maitreyee Sinha) conducted the field reconnaissance within the Corridor Plan Update PSA on December 22, 2015. Prior to the field reconnaissance, MB&G reviewed the following resources:

- U.S. Fish and Wildlife Service (USFWS) list of federally listed, proposed, candidate species and species of concern which may occur in Clackamas County (USFWS 2015a);
- A project-specific Oregon Biodiversity Information Center (ORBIC) database search (ORBIC 2015);
- A StreamNet database search (StreamNet 2015);
- The Oregon Department of Agriculture (ODA) list of state-listed threatened or endangered plant species which may occur in Clackamas County (ODA 2015);
- U.S. Geological Survey topographic maps (USGS 1984);
- USFWS National Wetlands Inventory (NWI) mapping (USFWS 2015b);
- Local Wetland Inventory (LWI) mapping records for the City of Happy Valley (Vigil Agrimis 2009);
- Oregon Explorer Map Viewer for the Oregon Rapid Wetland Assessment Protocol (ORWAP) (Rempel et al. 2009);
- The Soil Survey of Clackamas County, Oregon (NRCS 2015);
- A previous wetland delineation report addressing areas within the PSA (Consultant 2013);
- The Natural Resource Assessment for Tax lots 1501 and 1801 (Tax Map 1 3E 31D) (Consultant 2014).

During the field reconnaissance, MB&G noted the general boundaries of likely jurisdictional wetlands and waters and assessed general habitat conditions for sensitive wildlife, plant, and fish species within the PSA. MB&G conducted the field reconnaissance from public road rights-of-way along SE Troge Road and SE 172nd Avenue. In addition, MB&G obtained right-of-entry to the Beall Property located immediately west of the existing 172nd Avenue / SE Troge Road intersection (refer to Figure 1). Potentially jurisdictional wetlands within the Beall property were identified in accordance with the criteria and methods described in the *1987 U.S. Army Corps of Engineers (USACE) Delineation Manual* (Environmental Laboratory Technical Report 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0* (Regional Supplement) (USACE 2010) by inspecting soils, indicators of wetland hydrology, and vegetation. Potentially jurisdictional wetlands that were outside of the Beall property were identified based on observed topography and evident wetland vegetation as visible from the road right-of-ways; soils and hydrology were not inspected outside the Beall property as additional rights-of-entry were not obtained for the field reconnaissance.

3.0 SUMMARY OF WETLAND, WATERS AND SENSITIVE SPECIES IN PSA

The following sections of this memorandum summarize the primary natural resources identified during the desktop review of available information and field reconnaissance of the Corridor Plan Update PSA on December 22, 2015.

Wetlands

Numerous jurisdictional wetlands are mapped within the Corridor Plan Update PSA based on review of a previous wetland delineation conducted in the area and the MB&G field reconnaissance. Two large wetlands (Wetlands A and B) were identified in a previous wetland delineation south of SE Troge Road and east of SE 172nd Avenue (Figure 4 in Appendix A) (Consultant 2013). Wetland A is a Palustrine Emergent Wetland (PEM) adjacent to SE 172nd Avenue and south of SE Troge Road (Consultant 2013). Wetland B is PEM wetland greater than 1 acre in size and adjacent to SE Troge Road (Consultant 2013). Wetland B is also distinguished as a Locally Significant Wetland due to its size (greater than 1 acre) and proximity to Rock Creek, which is an Oregon Department of Environmental Quality (DEQ) 303(d) listed stream (Vigil Agrimis 2009). Locally Significant Wetlands are ‘wetland sites that provide functions or exhibit characteristics that are pertinent to community planning decisions made at a local scale’ (Oregon Administrative Rules [OAR] 141-086-0330[5]). In addition, MB&G identified a PEM/Palustrine Scrub-Shrub (PSS) wetland complex (Wetlands C) on the terrace northwest of Rock Creek and west of SE 172nd Avenue, which includes the Beall Property. MB&G also identified multiple PEM/PSS wetlands (Wetlands D) immediately adjacent to the Ordinary High Water Mark (OHWM) of Rock Creek both west and east of SE 172nd Avenue.

When the Corridor Plan Update PSA is refined, a wetland/waters delineation should be conducted to identify all wetlands within the Corridor Plan Update PSA and determine the exact location of each wetland feature for avoidance or minimization of wetland impacts.

Waters

One stream (Rock Creek) and five roadside drainage ditches were identified within the Corridor Plan Update PSA based on LWI data (Vigil Agrimis 2009) and MB&G’s field reconnaissance. Two of these five roadside ditches are also identified in a previous wetland delineation conducted in the area (Consultant 2013) (Figure 4).

Unlike most fluvial systems west of the Cascade Range, the gradient of Rock Creek increases as the creek flows through its watershed. As such, a large (approximately 22-foot) waterfall occurs in Rock Creek approximately 1.6 mile west and downstream of the Corridor Plan Update PSA. This waterfall is a passage barrier for all anadromous salmonid fish species and is approximately 0.9 mile upstream of the creek’s confluence with the Clackamas River (StreamNet 2015). However, anadromous lamprey species are able to migrate upstream of this waterfall and into the upper reaches of Rock Creek.

A wetland/waters delineation should be conducted within the Corridor Plan Update PSA in the next phases of the project to identify all waterbodies and roadside drainage ditches within the Corridor Plan Update PSA. This will identify the exact location of each waters feature and determine if the features are potentially jurisdictional for avoidance or minimization of waters impacts. In addition, the average active channel width of Rock Creek should be assessed in order to determine the required bridge spans relative to state and federal fish passage requirements.

Sensitive Species

USFWS and ODA identify eight sensitive botanical species that may occur within the vicinity of the Corridor Plan Update PSA (USFWS 2015a, ODA 2015). These species are listed in Table 1 in Appendix B along with their preferred habitat and whether or not critical habitat has been designated for the species. No sensitive botanical species were identified within a 2-mile radius of the Corridor Plan Update PSA (ORBIC 2015). Based on the site reconnaissance, potential habitat may also exist within the Corridor Plan Update PSA for Nelson’s checkermallow (*Sidalcea nelsoniana*), peacock larkspur (*Delphinium pavonaceum*), and white rock larkspur (*Delphinium leucophaeum*) (Table 2); all of which are either state- or federally-listed as Threatened or Endangered. A rare plant survey should be conducted within the revised Corridor Plan Update PSA during the peak flowering period of these species to determine if any sensitive species are located within the Corridor Plan Update PSA.

Table 2. Sensitive Botanical Species whose habitat may exist within the Corridor Plan Update PSA.

Common Name	Scientific Name	Federal Listing Status	State Listing Status	Flowering Period
Nelson’s checkermallow	<i>Sidalcea nelsoniana</i>	T	T	Late May through mid-July.
Peacock larkspur	<i>Delphinium pavonaceum</i>	SOC	E	Late April through June.
White rock larkspur	<i>Delphinium leucophaeum</i>	SOC	E	May through June.

USFWS and ORBIC identify 17 sensitive wildlife species that may occur within the vicinity of the Corridor Plan Update PSA (USFWS 2015a, ORBIC 2015). These species are also listed in Table 1 in Appendix B along with their preferred habitat and if critical habitat has been designated for the species. This list also includes species identified by USFWS as Migratory Birds/Birds of Conservation Concern that have the potential to inhabit Clackamas County (USFWS 2015a). In addition, the list includes one Federal Species of Concern (Oregon slender salamander *Batrachoseps wright*) (ORBIC 2015). Based on the site reconnaissance, no habitat for Threatened or Endangered species was identified within the Corridor Plan Update PSA. However, the Corridor Plan Update PSA does have the potential to provide habitat for migratory birds.

USFWS, StreamNet, and ORBIC identify five sensitive fish species that may occur within the vicinity of the Corridor Plan Update PSA (USFWS 2015a, StreamNet 2015, ORBIC 2015). These species are listed in Table 1 in Appendix B along with their respective Evolutionarily Significant Units (ESU) and Distinct Population Segments (DPS), and if critical habitat has been designated for the species. Pacific lamprey (*Lampetra tridentata*) and rainbow trout (*Oncorhynchus mykiss*) are known to occur within the Corridor Plan Update PSA in Rock Creek and coho salmon (*O. kisutch*), Chinook salmon (*O. tshawytscha*), and steelhead (anadromous rainbow trout) (*O. mykiss*) are known to occur downstream of the Corridor Plan Update PSA due to the impassable waterfall downstream on Rock Creek. As such, no listed fish species occur in the Corridor Plan Update PSA. Rainbow trout and Pacific lamprey are also considered native migratory fish under the jurisdiction of Oregon’s Fish Passage Law.

4.0 RESOURCE IMPACTS AND POTENTIAL PERMITTING IMPLICATIONS

The three proposed design concepts addressed in this memorandum will largely follow an identical permitting pathway regarding wetlands, waters, and sensitive species. As such, this section provides a discussion of the potential impacts common to all three design concepts with a note below to describe where the alignments' permitting pathway diverges.

A wetland/water delineation and report will be required for the proposed project to determine accurate wetland/waters locations and dimensions. Review of the report and a jurisdictional determination will be required from the Oregon Department of State Lands (DSL) and USACE.

Impacts to wetlands and waters are likely to result from implementation of the proposed project; therefore, the following laws and regulations will apply to the project: Section 404 of the Clean Water Act, administered by the USACE; and the Removal Fill Law, administered by the DSL.

Due to the extensive wetlands preliminarily identified in all quadrants of the Corridor Plan Update PSA, it is likely that wetland impacts will exceed 0.20 acre and a functional assessment utilizing the ORWAP (Oregon Rapid Wetland Assessment Protocol) or Hydrogeomorphic Assessment for the Willamette Valley will be required.

If proposed impacts are less than 0.5 acre, then the proposed project may qualify for the USACE Nationwide Permit (NWP) #14, Linear Transportation Projects authorization. This NWP also authorizes temporary structures, fills, and work necessary to construct linear transportation projects; however, temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations and must be revegetated, as appropriate.

To qualify for DSL's General Permit (GP) for Transportation-Related Structures, impacts are limited to a total of 5,000 cubic yards of material filled, removed, or altered in non-wetland waters with no greater than 0.5 acre of permanent wetland impacts.

If the project impacts exceed these thresholds, an Individual Permit will be required from both the USACE and DSL. Application for a NWP and GP are made using the DSL/USACE Joint Permit Application.

Note: All three design concepts will likely impact Wetland A and Wetland B, which were preliminarily identified west of SE 172nd Avenue; as well as Wetlands D (adjacent to the Rock Creek OHWM). However, based on the desktop review and MB&G field reconnaissance, the AT2 Concept will significantly impact Wetland A and Wetland B (Figure 4 in Appendix A) of which Wetland B has been identified as locally significant (Vigil Agrimis 2009). While avoidance and minimization measures should be applied to all wetlands, Locally Significant Wetlands should be particularly avoided because they are protected by the City of Happy Valley Code as part of the National Resource Overlay Zone (NROZ) (HVMC 16.34.020). Alternatively, based on the desktop review and MB&G field reconnaissance, Concepts C2 and C2A will only require sliver impacts to Wetland A and Wetland B in order to widen SE Troge Road and realign SE 172nd Avenue. It is important to note that this assessment is based on limited access to the Corridor Plan Update PSA (public rights-of-way and Beall Property right-of-entry). As such, additional wetlands are likely present within the PSA and, as mentioned previously, a wetland/waters delineation and report should be prepared and conducted in order to determine accurate wetland/waters locations and dimensions within the PSA.

Note: Concept 2A would likely have significantly higher impacts to Rock Creek to account for the realignment of the creek within the Corridor Plan Update PSA.

Impacts to wetlands/waters of the U.S. and State will require compensatory mitigation by both the USACE and DSL. The Corridor Plan Update PSA is located within the Foster Creek Wetland Mitigation Bank service area and wetland credits are currently available at this bank for \$250,000 per acre. If bank credits are unavailable during the permitting process, alternative forms of mitigation will need to be considered, including payment-in-lieu (for DSL-jurisdictional impacts only) or on- or off-site wetland creation, enhancement, or restoration. If on- or off-site mitigation is proposed, the DSL and USACE will require preparation of a compensatory wetland mitigation plan and at least five years of post-construction monitoring to meet performance criteria. A Compensatory Non-Wetland Mitigation Plan will likely also be required for the proposed project. This plan will need to address mitigation strategies that will be employed to offset impacts to Rock Creek and potential jurisdictional roadside drainage ditches within the Corridor Plan Update PSA and will likely be subject to a three year monitoring period to meet performance criteria. These strategies may include onsite riparian plantings, stormwater management, and the addition of fish-friendly stream substrate, etc.

DEQ's 401 Water Quality Certification (WQC) process will be triggered if an USACE permit is required for wetland/waters impacts due to the addition of impervious surfaces for the proposed project. If a 401 WQC is required, a Stormwater Management Plan should be prepared and will need to be approved by DEQ. This plan should follow the DEQ's Stormwater Management Plan requirements as detailed in the *Stormwater Management Plan Submission Guidelines for Removal/Fill Permit Applications which Involve Impervious Surfaces* (2005). The PSA will be subject to stormwater management requirements unless no wetland/waters impacts are required or all stormwater for the PSA's contributing impervious surface is infiltrated. Stormwater requirements include water quality treatment for post-construction stormwater runoff from all contributing impervious area. Flow control (water quantity treatment) may also be required. The design requirements are dictated by the most conservative of local requirements which for this project will likely be Endangered Species Act (ESA) compliance mechanism (discussed in more detail below).

Project construction activities are anticipated to disturb more than 1 acre of land. As a result, the National Pollutant Discharge Elimination System (NPDES) permit program, administered under Section 402 of the Clean Water Act, will require an NPDES 1200-C or 1200-CA permit to be secured for the project. Clackamas County currently holds a 1200-CA permit, therefore a permit would only need to be applied for if an entity other than the County constructs the project or if the County's permit expires. This permit also requires that the holder prepare an Erosion and Sediment Control Plan (ESCP) which utilizes approved Best Management Practices (BMPs) to prevent erosion and control sediment runoff from the construction site. In addition, the permit requires the applicant to inspect and maintain erosion controls to ensure they are working properly.

ESA-listed fish species are known to occur downstream of the Corridor Plan Update PSA within Rock Creek and the Clackamas River. Although the proposed project will likely include in-water work (bridge construction, culvert removal), direct effects to ESA-listed fish are not likely because they are not found within the Corridor Plan Update PSA (due to the 22-foot waterfall downstream of the Corridor Plan Update PSA). However, these listed species could be affected indirectly by stormwater runoff originating from impervious surfaces within the Corridor Plan Update PSA.

This combined with a project federal nexus (receipt of federal funding or a federal permit) requires that the project comply with the federal ESA. Consultation with the National Marine Fisheries Service (NMFS) will be necessary and a Biological Assessment documenting the project's impacts and minimization measures will be required. This can likely be accomplished through use of a programmatic Biological Opinion (BO), in particular, the Federal Aid Highway Programmatic (FAHP) BO which can be utilized if Federal Highway Administration funding is being applied to the proposed project. If waters impacts are anticipated and federal funding is not being applied, a Standard Local Operating Procedures for Endangered Species (SLOPES V) BO compliance document will need to be prepared. A botanical survey should be conducted during the appropriate blooming period for Nelson's checkermallow, peacock larkspur, and white rock larkspur to identify whether these species occur within the Corridor Plan Update PSA. Pending the outcome of this survey, it may be possible for a No Effect Memorandum to be prepared to document the lack of project effects on these species.

There are known resident native migratory fish (Pacific lamprey and rainbow trout) within the Corridor Plan Update PSA. As such, the new or improved crossings at Rock Creek will need to be designed to provide fish passage in accordance with Oregon's Fish Passage Law. Oregon Department of Fish and Wildlife (ODFW) Fish Passage Plans will need to be prepared to document the project's compliance.

The Rock Creek bridge replacements should be designed to span the Rock Creek average active channel width for resident fish (Pacific lamprey and rainbow trout) to comply with the Oregon Fish Passage Law. In addition, as part of the FAHP and SLOPES programmatic BOs (mentioned above), NMFS requires bridges to be designed to 1.5 times the average active channel width (for single span bridges) for ESA-listed species; however, due to the lack of ESA-listed fish within the Corridor Plan Update PSA, this requirement can likely be waived in pre-consultation negotiations with NMFS representatives. These requirements also apply to temporary bridges that may be needed to facilitate construction over Rock Creek.

Engaging ODFW and NMFS early in the design process will be essential to streamlining the review and approval of the fish passage plans (and ESA compliance documents mentioned above).

Note: Two fish passage plans will need to be prepared for both the AT2 and Concept 2A proposed projects because these projects include two bridges. In addition, the fish passage plans for Concept 2A would also need to address the proposed realignment of Rock Creek to ensure that realigned creek channel meets fish passage criteria.

All in-water activities within Rock Creek should be scheduled during ODFW-preferred In-Water Work Window for the Clackamas River/Johnson Creek and their tributaries (July 15 through August 31) (ODFW 2008).

Migratory birds have the potential to inhabit the Corridor Plan Update PSA. To avoid conflicts with the Migratory Bird Treaty Act (MBTA), vegetation clearing should occur between September 1 and February 28 to avoid impacts to nesting migratory birds.

8.0 REFERENCES

- Consultant. 2014. Natural Resource Assessment prepared by SWCA Environmental Consultants for Tax lots 1501 and 1801 (Tax Map 1 3E 31D). Happy Valley, Oregon.
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Appendix A. Figures

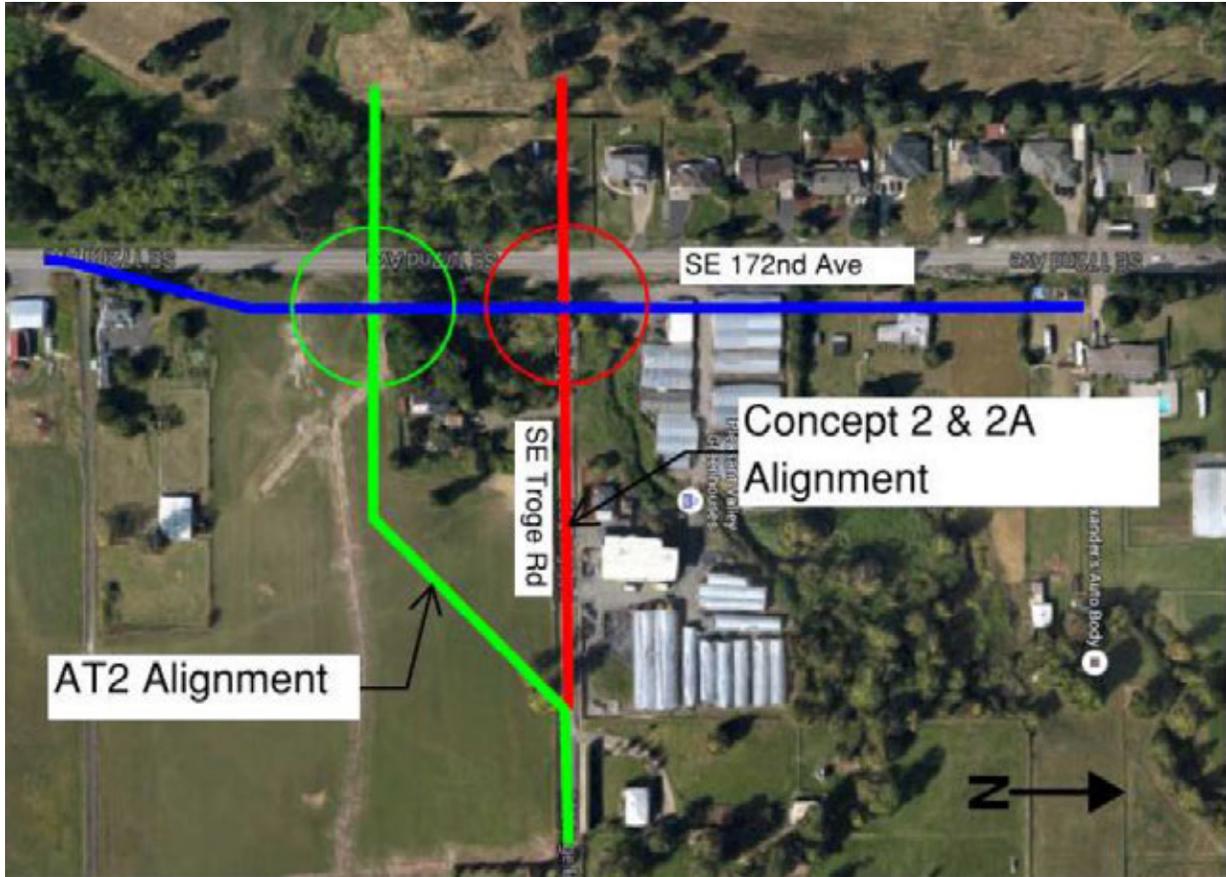


Figure 2. Three proposed concepts for the SE 172nd Avenue / SE Troge Road intersection.

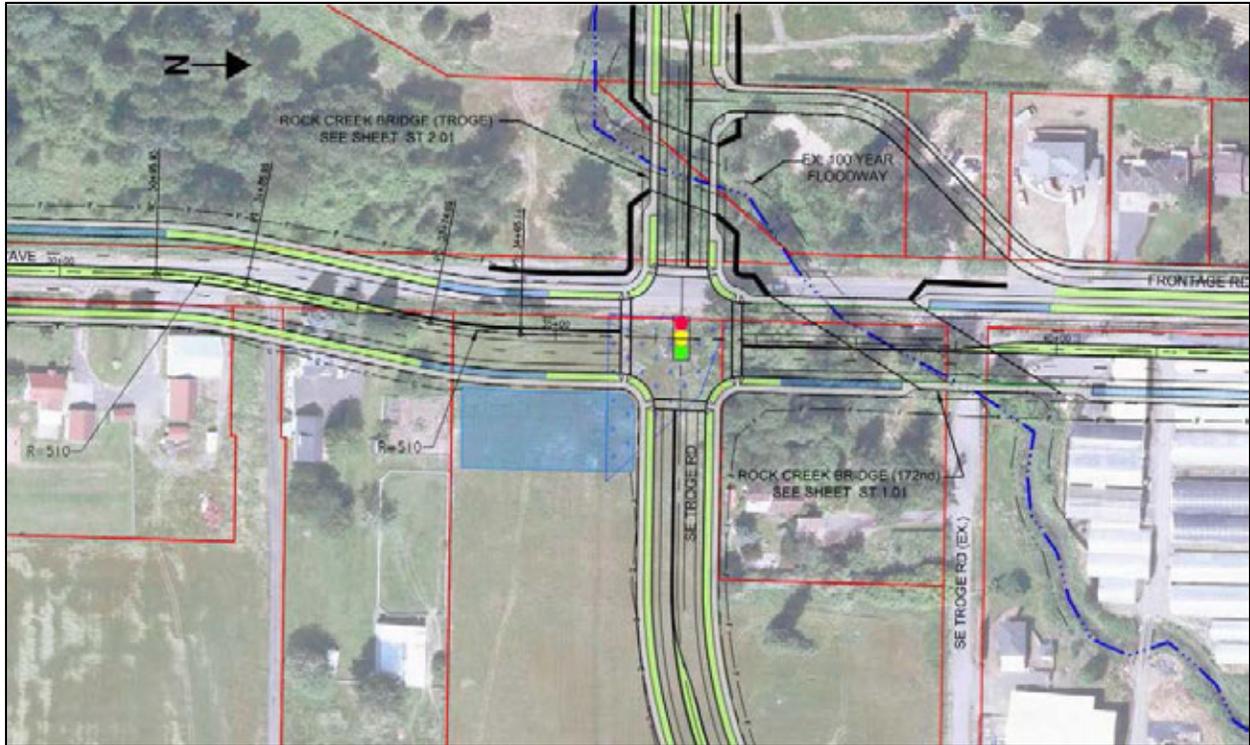


Figure 3a. Concept AT2 Alignment

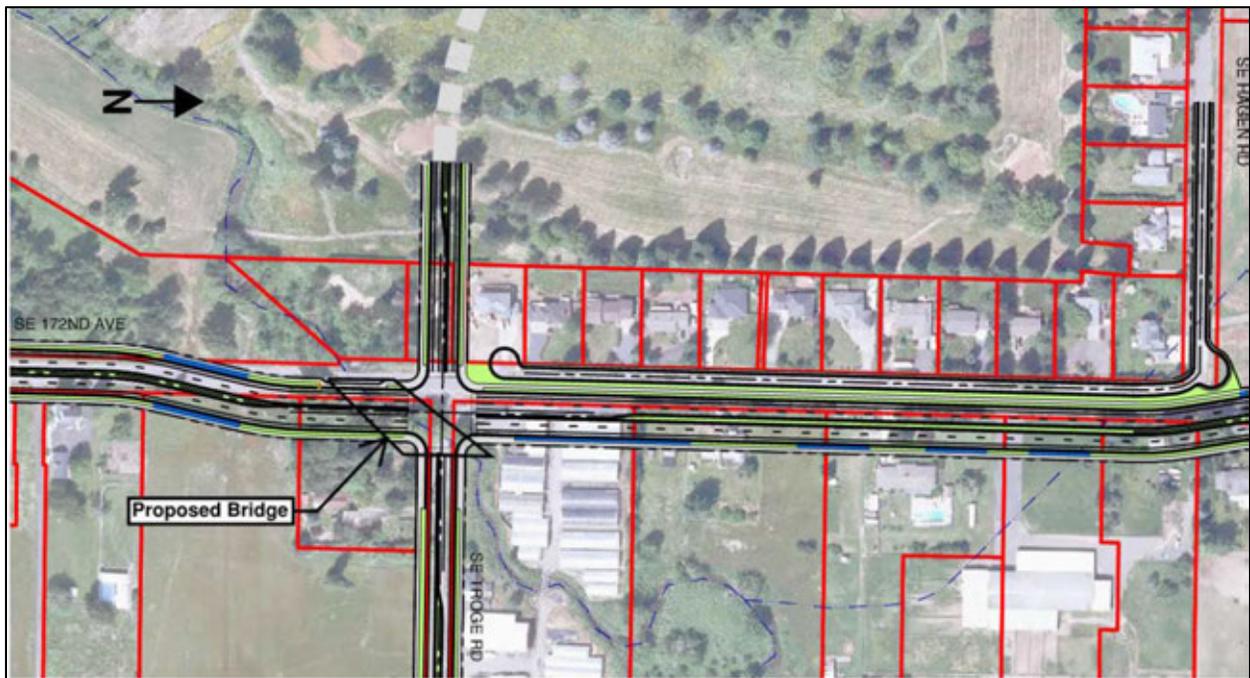


Figure 3b. Concept 2 Alignment

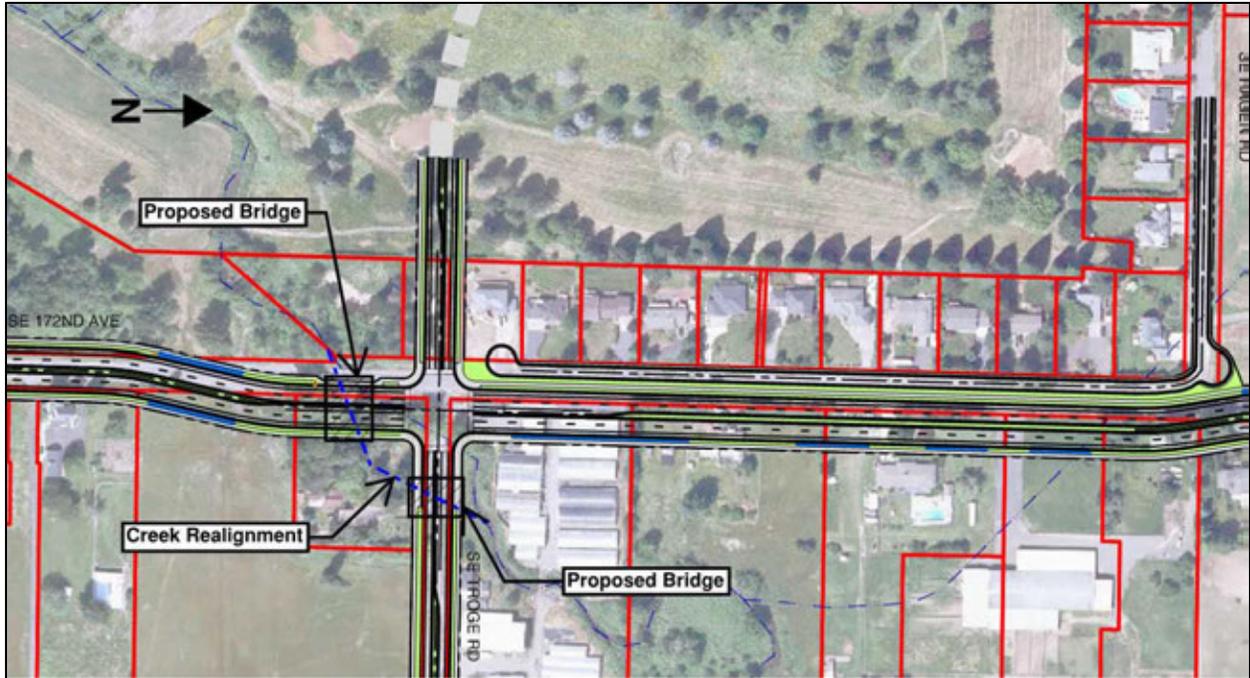
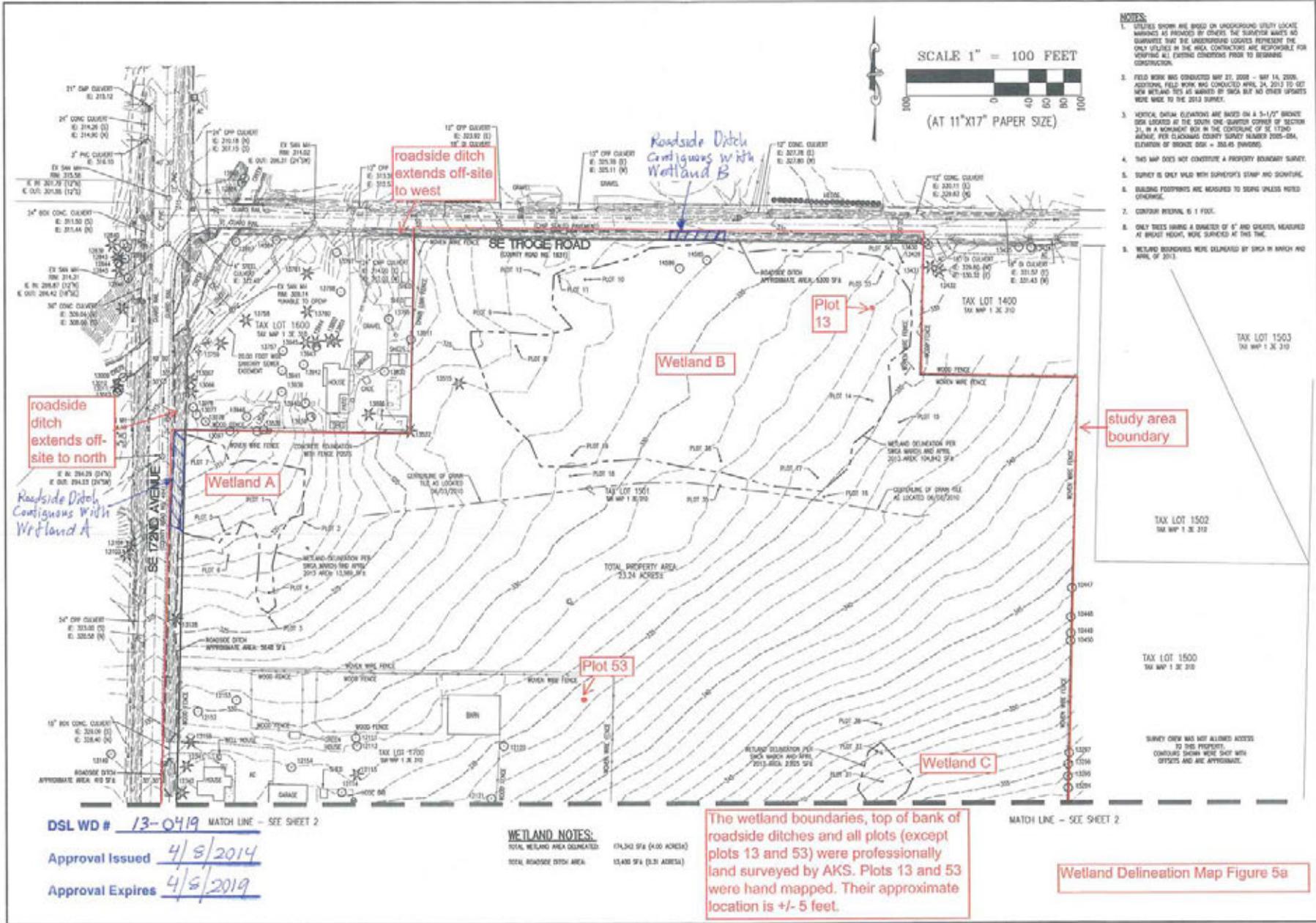


Figure 3c. Concept 2A Alignment



- NOTES:**
- UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS AS PROVIDED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND LOCATIONS REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
 - FIELD WORK WAS CONDUCTED MAY 27, 2008 - MAY 14, 2009. ADDITIONAL FIELD WORK WAS CONDUCTED APRIL 24, 2013 TO SET NEW WETLAND TIES AS MARKED BY SIGMA BUT NO OTHER UPDATES WERE MADE TO THE 2013 SURVEY.
 - VERTICAL DATUM ELEVATIONS ARE BASED ON A 5-1/2" BROWNIE 2008 LOCATED AT THE SOUTH ONE-QUARTER CORNER OF SECTION 31, IN A MONUMENT BOX IN THE CORNER OF SE 172ND AVENUE, PER CLATSOP COUNTY SURVEY NUMBER 2005-284, ELEVATION OF BROWNIE BOX = 354.45 (TWAS).
 - THIS MAP DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.
 - SURVEY IS ONLY VALID WITH SURVEYOR'S STAMP AND SIGNATURE.
 - BUILDING FOOTPRINTS ARE REQUIRED TO BEING UNLESS NOTED OTHERWISE.
 - CONTOUR INTERVAL IS 1 FOOT.
 - ONLY TREES HAVING A DIAMETER OF 4" AND GREATER MEASURED AT BREAST HEIGHT, WERE SURVEYED AT THIS TIME.
 - WETLAND BOUNDARIES WERE DELINEATED BY SIGMA IN MARCH AND APRIL OF 2013.



ROCK CREEK MEADOWS
HAPPY VALLEY OREGON

EXISTING CONDITIONS PLAN AND WETLAND MAP

DESIGNED BY: JAM
DRAWN BY: JAM
CHECKED BY: MBI
SCALE: AS NOTED
DATE: 12-19-2013
REGISTERED PROFESSIONAL LAND SURVEYOR
PHIL IMMINAH
NO. 12,381
MANAGER & PRINCIPAL
SIGMA
ROAD, DRIVE
SEASIDE, OR 97138

JOB NUMBER: 3403
SHEET: 1 OF 2

DSL WD # 13-0419 MATCH LINE - SEE SHEET 2
Approval Issued 4/8/2014
Approval Expires 4/8/2019

WETLAND NOTES:
TOTAL WETLAND AREA DELINEATED: 174,242 SF (4.00 ACRES)
TOTAL ROADSIDE DITCH AREA: 13,430 SF (0.31 ACRES)

The wetland boundaries, top of bank of roadside ditches and all plots (except plots 13 and 53) were professionally land surveyed by AKS. Plots 13 and 53 were hand mapped. Their approximate location is +/- 5 feet.

Wetland Delineation Map Figure 5a

Appendix B.

Table 1. Sensitive Species Identified During Records Review of the 172nd/190th Corridor Plan Update PSA.

Table 1. Sensitive Species Identified During Records Review of the 172nd/190th Corridor Plan Update PSA.

Common Name	Scientific Name	Mapped Critical Habitat (Yes or No)	Preferred Habitat	Habitat Potentially Present within PSA?	Federal Listing Status	State Listing Status	Source
Sensitive Botanical Species							
Bradshaw's Desert-parsley	<i>Lomatium bradshawii</i>	No	Seasonally saturated or flooded prairies, adjacent to creeks and small rivers.	No	E	E	USFWS
Kincaid's Lupine	<i>Lupinus sulphureus ssp. kincaidii</i>	Yes (outside the PSA)	Native grassland habitats, native upland prairie.	No	T	T	USFWS
Nelson's checkermallow	<i>Sidalcea nelsoniana</i>	No	Relatively open areas on damp soil, in meadows, wet prairie remnants, fencerows	Yes	T	T	USFWS, ODA
Peacock larkspur	<i>Delphinium pavonaceum</i>	No	Dry roadsides, well-drained native prairie.	Yes	SOC	E	USFWS, ODA
Water howellia	<i>Howellia aquatilis</i>	No	Freshwater ponds, lakes, sloughs that may dry up by the end of summer.	No	T	T	ODA, USFWS
White rock larkspur	<i>Delphinium leucophaeum</i>	No	Dry bluffs and open ground, now restricted to ditches and fencerows; rocky basalt cliffs.	Yes	SOC	E	USFWS, ODA
Whitetop aster	<i>Sericocarpus rigidus</i>	No	Low elevation, moist native prairies, on well-drained upland soils in oak savannas.	No	SOC	T	USFWS, ODA
Willamette daisy	<i>Erigeron decumbens</i> var. <i>decumbens</i>	Yes (outside of PSA)	Native wetland and upland prairie, oak savanna, heavier soils, restricted to native prairie grassland.	No	E	E	USFWS, ODA
Sensitive Wildlife Species							
Bald eagle	<i>Haliaeetus leucocephalus</i>	No	Mature coniferous and hardwood forests near open water	No	Delisted/ BCC	T	ORBIC, USFWS
Brewer's sparrow	<i>Spizella breweri</i>	No	Open flats covered with sagebrush, open prairie, pinyon-juniper woodland.	Yes	None/ BCC	None	USFWS
Calliope Hummingbird	<i>Stellula calliope</i>	No	Forest glades, canyons, usually mountains; favors open shrubby areas.	No	None/ BCC	None	USFWS
Flammulated Owl	<i>Otus flammeolus</i>	No	Open pine forests in mountains. Favors open forests of ponderosa pine, or aspen groves	No	None/ BCC	None	USFWS
Fox Sparrow	<i>Passerella iliaca</i>	No	Wooded areas, undergrowth, brush. Requires brushy areas for breeding	Yes	None/ BCC	None	USFWS
Northern red-legged frog	<i>Rana aurora aurora</i>	No	Requires cool-water ponds, lake edges or slow streams for breeding	No	SOC	SV	ORBIC
Northern spotted owl	<i>Strix occidentalis caurina</i>	Yes (Outside of PSA)	Mature and old-growth coniferous forests	No	T	T	USFWS
Olive-sided flycatcher	<i>Contopus cooperi</i>	No	Conifer forests, burns, clearings. Breeds around edge of open areas in forests.	Yes	SOC/ BCC	SV	USFWS
Oregon slender salamander	<i>Batrachoseps wrighti</i>	No	Moist Douglas fir and mixed maple, hemlock and red cedar woodlands; found in downed logs and crevices.	Yes	SOC	SU	ORBIC

Common Name	Scientific Name	Mapped Critical Habitat (Yes or No)	Preferred Habitat	Habitat Potentially Present within PSA?	Federal Listing Status	State Listing Status	Source
Peregrine falcon	<i>Falco peregrinus</i>	No	Tall cliffs located near water; tall urban bridges	No	Delisted/ BCC	N/A	USFWS
Purple finch	<i>Carpodacus purpureus</i>	No	Woods, groves, and suburbs. Breeds in coniferous and mixed woods	Yes	None/ BCC	N/A	USFWS
Rufous Hummingbird	<i>Selasphorus rufus</i>	No	Forest edges, clearings, streamside, mountain meadows.	Yes	None/ BCC	N/A	USFWS
Short-eared Owl	<i>Asio flammeus</i>	No	Prairies, marshes, dunes, and tundra, open country/farms with rodents.	Yes	None/ BCC	N/A	USFWS
Streaked Horned Lark	<i>Eremophila alpestris strigata</i>	Yes (Outside PSA)	Open, bare areas with no adjacent trees; airports, agricultural fields	No	T	N/A	USFWS
Tricolored Blackbird	<i>Agelaius tricolor</i>	No	Cattail or tule marshes; forages in fields and farms.	No	None/ BCC	N/A	USFWS
Vesper sparrow	<i>Pooecetes gramineus</i> ssp. <i>Affinis</i>	No	Open areas such as meadows, fields, prairies, roadsides, dry ground with open soil.	Yes	None/ BCC	N/A	USFWS
Willow flycatcher	<i>Empidonax trailii</i>	No	Bushes, willow thickets, brushy fields, upland coves	Yes	None/ BCC	N/A	USFWS
Sensitive Fish Species							
Bull trout	<i>Salvelinus confluentus</i>	Yes (Outside of PSA)	Cold, stable perennial streams; unblocked migratory corridors	No	T	T	USFWS
Chinook salmon (Lower Columbia River ESU, fall run)	<i>Oncorhynchus tshawytscha</i>	Yes (Downstream of PSA)	Perennial streams (known to occur in Rock Creek downstream of PSA)	No; known to occur in Rock Creek downstream of PSA	T	SC/ NMF	Streamnet, ORBIC
Coho salmon (Lower Columbia River ESU)	<i>Oncorhynchus kisutch</i>	No	Perennial streams (known to occur in Rock Creek downstream of PSA)	No; known to occur in Rock Creek downstream of PSA	T	E/ NMF	Streamnet, ORBIC
Pacific lamprey	<i>Lampetra tridentata</i>	No	Perennial streams	Yes; known to occur in Rock Creek within PSA	SOC	SC/ NMF	Streamnet
Steelhead (lower Columbia River DPS, winter run)/ resident rainbow trout	<i>Oncorhynchus mykiss</i>	Yes (Downstream of PSA)	Perennial streams (Steelhead known to occur in Rock Creek downstream of PSA; Rainbow Trout known to occur in Rock Creek within the PSA)	No; known to occur in Rock Creek downstream of PSA	T/SOC	SC/SC/ NMF	Streamnet, ORBIC

E= Listed Endangered; T= Listed Threatened SOC= Species of Concern SC= Sensitive critical; SV= Sensitive vulnerable; SU= undetermined status; BCC= Bird of Conservation Concern; NMF = Native Migratory Fish.

Table 1 Impacts to Wetlands and Streams

IMPACTS TO WETLANDS AND STREAMS	AT2	2	2A
Minimize impacts to Wetlands A and B	-1	+1	+1
Minimize impacts to Wetlands C	-1	+1	+1
Minimize impacts to Wetlands D	-1	+1	+1
Minimize impacts to Rock Creek	+1	+1	-1
Minimize Rock Creek crossings	-1	+1	-1
AVERAGE SCORE	-3	+5	+1

Alternative	Impacts to Wetlands and Streams	Score	Notes
AT2	Minimize impacts to Wetlands A and B	-1	AT2 Concept will significantly impact Wetland A and Wetland B of which Wetland B has been identified as locally significant.
	Minimize impacts to Wetlands C	-1	AT2 Concept will impact comparatively more of Wetlands C (Beall Property and Rock Creek terrace).
	Minimize impacts to Wetlands D	-1	AT2 Concept will impact comparatively more of Wetlands D (wetlands on both sides of SE 172 nd Avenue).
	Minimize impacts to Rock Creek	+1	The AT2 Concept does not involve realigning Rock Creek.
	Minimize Rock Creek crossings	-1	This concept includes two new stream crossings over Rock Creek.
Concept 2	Minimize impacts to Wetlands A and B	+1	Based on the desktop review and MB&G field reconnaissance, Concepts C2 will only require sliver impacts to Wetland A and Wetland B in order to widen SE Troge Road and realign SE 172 nd Avenue.
	Minimize impacts to Wetlands C	+1	Concept 2 will impact comparatively less of Wetlands C (Beall Property only).
	Minimize impacts to Wetlands D	+1	Concept 2 will impact comparatively less of Wetlands D (only wetlands east of SE 172 nd Avenue).
	Minimize impacts to Rock Creek	+1	The 2 Concept does not involve realigning Rock Creek.
	Minimize Rock Creek crossings	+1	This concept includes one new stream crossing over Rock Creek.
Concept 2A	Minimize impacts to Wetlands A and B	+1	Based on the desktop review and MB&G field reconnaissance, Concepts C2A will only require sliver impacts to Wetland A and Wetland B in order to widen SE Troge Road and realign SE 172 nd Avenue.
	Minimize impacts to Wetlands C	+1	Concept 2A will impact comparatively less of Wetlands C (Beall Property only).
	Minimize impacts to Wetlands D	+1	Concept 2A will impact comparatively less of Wetlands D (only wetlands east of SE 172 nd Avenue).
	Minimize impacts to Rock Creek	-1	Concept 2A does involve realigning Rock Creek.
	Minimize Rock Creek crossings	-1	This concept includes two new stream crossings over Rock Creek.

Attachment B
OTAK Memorandum:
Constructability and Cost Analysis

Memorandum



808 SW 3rd Avenue
Suite 300
Portland, OR 97204
Phone (503) 287-6825
Fax (503) 415-2304

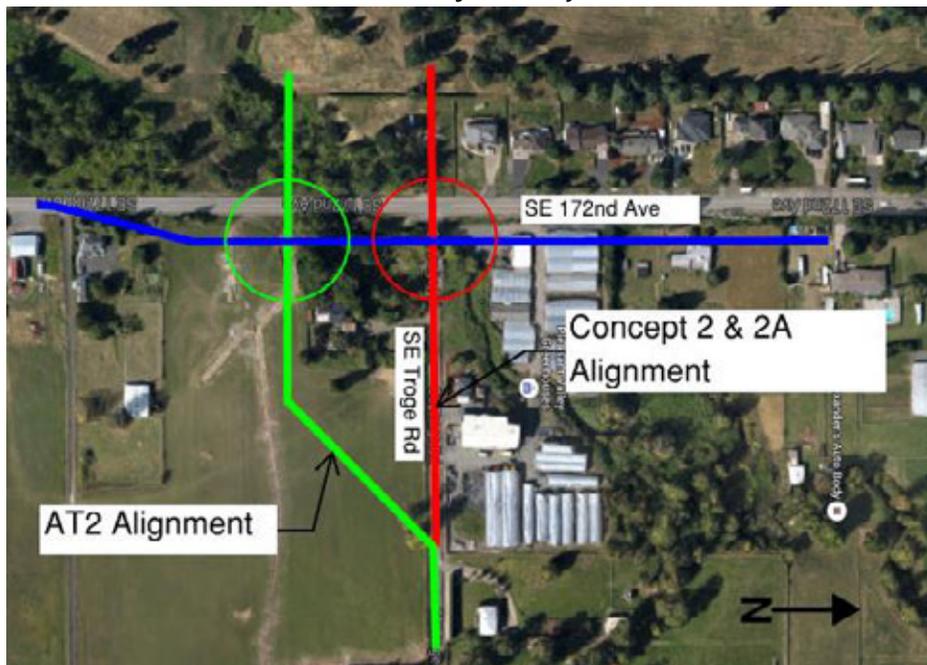
To: Wade Scarbrough, PE, Kittelson & Associates, Inc.
From: Adrian Esteban, PE
Copies: Project File
Date: January 27, 2016
Subject: SE 172nd Avenue and SE Troge Road Intersection Alignment
Project No.: 15343

This memorandum is intended to accompany an Alignment Option criteria matrix prepared for Kittelson & Associates, Inc. This document is for internal discussion purposes, and does not constitute a commitment to any alternative or design consideration for the SE 172nd Avenue and SE Troge Road Intersection project.

Study Area

The project study area (Exhibit 1) includes the intersection of SE 172nd Avenue and SE Troge Road, and the planned realignment of SE 172nd Avenue between SE Vogel Road and SE Hagen Road, and of SE Troge Road between SE 172nd Avenue and SE Foster Road. For the purposes of evaluation, the study area includes: (1) Adopted SE 172nd/SE 190th Corridor Plan AT2 Alignment; (2) Proposed Revision Concept 2 Alignment; and (3) Proposed Revision Concept 2A Alignment, which realigns Rock Creek. The following discussion outlines the characteristics and considerations for each alignment.

Exhibit 1. Project Study Area



Design Parameters

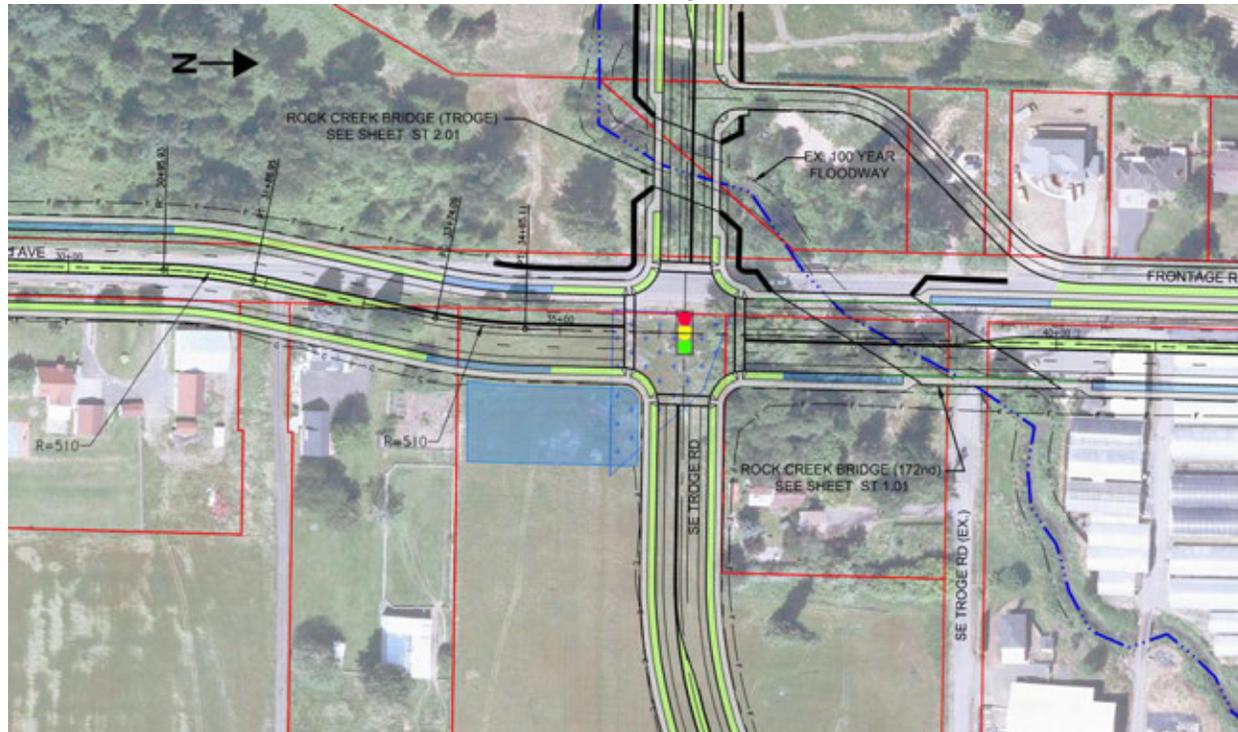
The design parameters for the structures are based on the following assumptions:

- SE 172nd Avenue roadway width (Bridge width) is 80 feet.
- SE Troge Road width (Bridge width) is 60 feet.
- Due to clearance requirements under the bridge, a shallow superstructure will be required which in turn necessitates multi-span bridges, versus using a single span.
- The Active Channel Width (ACW) is approximately 30 feet; therefore, the SLOPES requirement for bridge length is 2.2 times the ACW, which is 66 feet.
- Bridges will require deep foundations for the abutments (assume steel piling).

Adopted AT2 Alignment

The Adopted AT2 Alignment (Exhibit 2), adopted as part of the SE 172nd/SE 190th Corridor Plan, includes the realignment of SE Troge Road approximately 300 feet to the south of the existing intersection as well as the realignment of SE 172nd Avenue approximately 80 feet to the east of its existing location. The alignment includes two new bridges over Rock Creek, one bridge on SE Troge Road and one bridge on SE 172nd Avenue. The realignments of SE 172nd Avenue and SE Troge Road would result in private property impacts and environmental impacts.

Exhibit 2. Adopted Alignment AT2



Some of the key analysis points of Alignment AT2 include:

- The SE Troge Road bridge is approximately 70 feet long and 60 feet wide and the SE 172nd Avenue Bridge is approximately 140 feet long (due to the large skew) and 80 feet wide.
- The construction cost for the structures on this alignment is \$3.2M.

- The alignment of the roads will impact the vegetated corridor.
- An estimated additional 38,000 square feet of right-of-way (ROW) would need to be acquired for the SE Troge relocation when compared to the Proposed Revision Concept 2 Alignment. Approximate ROW Cost: \$990,000
- Environmental impacts of this alignment include the overall length of covered stream of approximately 240 feet. Approximate Mitigation Cost: \$75,000

The construction of the Troge Road Bridge will be relatively straightforward, as it is a new road section and the bridge can be constructed in one season. The construction of the 172nd Avenue Bridge will be more complicated, as it overlaps with the existing structure, requiring the construction to occur over two seasons in order to maintain continuous traffic flow. The first season would entail construction of half of the bridge, and the second season would demolish the existing bridge and construct the second half of the new bridge. The double mobilization adds cost to the project. Additionally, the sharp skew angle of the bridge makes the construction more difficult, as the standard precast sections can warp and have differential deflections if the skew angles are large. There are means to accommodate this but they increase cost over standard bridge construction.

Proposed Revision Concept 2 Alignment

The Proposed Revision Concept 2 Alignment (Exhibit 3), proposed as a revision to the Adopted AT2 Alignment of the SE 172nd/SE 190th Corridor Plan, includes widening of SE Troge Road in its existing alignment and realignment of SE 172nd Avenue approximately 80 feet to the east of its existing location. The alignment includes one new bridge over Rock Creek at the intersection of SE Troge Road and SE 172nd Avenue. The realignment of SE 172nd Avenue and the widening of SE Troge Road would result in private property impacts and environmental impacts.

Exhibit 3. Proposed Revision Concept 2 Alignment



Some of the key analysis points of the Revised Concept 2 Alignment include:

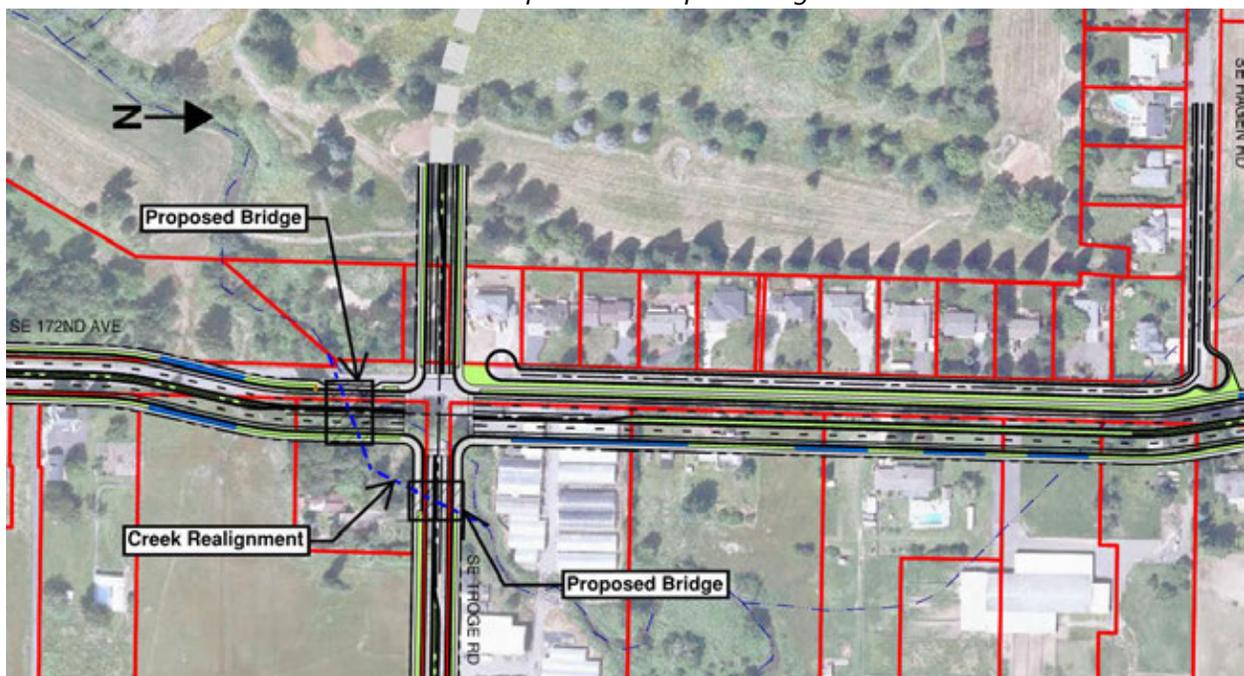
- This alignment is being proposed as a revision to the AT2 Alignment that was adopted as part of the SE 172nd/SE 190th Corridor Plan.
- This alignment involves one long bridge that follows the existing Rock Creek alignment and cuts diagonally across the entire intersection.
- The bridge configuration is approximately 120 feet and 80 feet wide, but has a large skew.
- The construction cost for the structures on this alignment is \$3.8M (Highest).
- Environmental impacts of this alignment include the overall length of covered stream of approximately 230 feet. Approximate Mitigation Cost: \$50,000
- The total required ROW for SE Troge is approximate 38,000 SF less than the Adopted AT2 Alignment as it widens the existing roadway alignment. Approximate ROW Cost: \$610,000

The construction of the bridge in this option may take at least three stages as it overlaps with both the existing bridge on 172nd Avenue and the existing bridge on Troge Road. To maintain traffic and the required turns, distinct portions of the structure will have to be constructed as well as timed demolition of the existing bridges. This long bridge also has a large skew angle, invoking several of the difficulties of construction as noted in the AT2 alignment 172nd Avenue Bridge.

Proposed Revision Concept 2A Alignment

The Proposed Revision Concept 2A Alignment (Exhibit 4) is the same as that of Proposed Revision Concept 2A, but it includes the realignment of Rock Creek to eliminate the large, skewed structure that is part of the Proposed Revision Concept 2 Alignment. By realigning Rock Creek the alignment would now require two new bridges over Rock Creek, one bridge at SE Troge Road and one bridge on SE 172nd Avenue, which is similar to the Adopted AT2 Alignment.

Exhibit 4. Proposed Concept 2A Alignment



Some of the key analysis points of the Revised Concept 2A Alignment include:

- This alignment is being proposed as an alternative to the Proposed Revision Concept 2 Alignment.
- This alignment involves two bridges over Rock Creek, one bridge on SE Troge Road north of the intersection and one bridge on SE 172nd Avenue, east of the intersection. Both bridges will follow the proposed creek orientation.
- The SE Troge Road Bridge would be 65 feet long and 60 feet wide and the SE 172nd Avenue Bridge would be 65 feet long and 80 feet wide.
- The construction cost for the structures on this alignment is \$2.9M (Lowest) and includes estimated cost for Rock Creek reconstruction.
- The alignment would have the largest environmental impact due to the realignment of the creek and would increase permitting costs and require a longer schedule.
- Environmental impacts of this alignment include the overall length of covered stream of approximately 170 feet. Approximate Mitigation Cost: \$150,000
- The total required ROW is the same as Concept 2A but this option would require additional ROW for relocation of the creek. Approximate ROW Cost: \$735,000

The construction of each bridge (SE 172nd Avenue and SE Troge Road) should be relatively straightforward as they are independent of each other, independent of the existing bridges and they have shallow skew angles. There may still need to be work during two seasons, but if the new bridges are shifted outside of the Ordinary High Water Mark (OHWM) of the existing stream, they along with the new realigned stream channel could be constructed at any time of the year, and the connection to the existing stream and demolition of the existing bridges only would be restricted to the in-water work window.

In all three options, the new bridges would be constructed in accordance with AASHTO and ODOT guidelines, and presumably have concrete abutment walls and precast concrete superstructures. All the bridges would be properly drained and use modern durable materials for the deck, railings and other exposed items. From a short term or long term maintenance standpoint of the bridge structures, there is no real differences between the alternatives.

From the stream crossing standpoint, there do not appear to be any major differences in terms of maintenance. The stream is relatively small, and does not appear to be capable of transporting large amounts of debris during flood events. The realigned stream (Revision Concept 2A alignment) will have two additional corners, but they can be constructed to maintain alignment and withstand scour for the maximum expected flows.

Alignment Option Criteria Matrix

The SE 172nd Avenue and SE Troge Road Intersection project study area alignments have been analyzed based on a set of five considerations (Table 1). Each consideration is scaled Favorable, Neutral, or Not Favorable as defined below.

SE 172nd Avenue & SE Troge Road Intersection

City of Happy Valley
 January 27, 2016

Legend
NOT FAVORABLE,LOW
NEUTRAL,MEDIUM
FAVORABLE,HIGH

Alignment Analysis	Adopted AT2 Alignment	Proposed Concept 2 Alignment	Proposed Concept 2A Alignment
Description	Realign Intersection of SE 172nd & SE Troge Rd 300' South of Existing Location	Improve Existing SE Troge Rd In Existing Location	Same as Concept 2 Alignment Realigns Rock Creek
Bridge Configuration	NEUTRAL Two skewed bridges	NOT FAVORABLE One highly skewed bridge, 120'L x 80'W	FAVORABLE Two slightly skewed bridges, 65'L x 80'W & 60'W
Construction (Bridge Costs)	NEUTRAL \$3.2M	NOT FAVORABLE \$3.8M	FAVORABLE \$2.9M
Environmental Impacts (Mitigation Costs)	NEUTRAL \$75,000	FAVORABLE \$50,000	NOT FAVORABLE \$150,000
Right-Of-Way Impacts (SE Troge Costs)**	NOT FAVORABLE \$990,000	FAVORABLE \$610,000	NEUTRAL \$735,000
Constructability	FAVORABLE 1 Stage for Construction	NOT FAVORABLE 3 Stages for Construction	NEUTRAL 2 Stages for Construction

*Assumes \$200k per acre based on mitigation bank credit

** Assumes \$10 per SF

Note: All costs estimates are based on today's dollar value

Considerations and Scaling Definitions:

- Bridge Configuration: Examines type, size, and location of required structures
 - o Favorable: Shorter bridge, no skew to slightly skewed
 - o Neutral: Longer bridge, slightly skewed to skewed
 - o Not Favorable: Longer bridge, skewed to highly skewed, wider structure

- Construction Cost: Estimated construction cost for alignments
 - o Favorable: Minimal cost due to use of existing infrastructure
 - o Neutral: Standard cost for new infrastructure
 - o Not Favorable: High cost due to additional items beyond standard section

- Environmental Impacts: Estimated impacts to wetlands, vegetated corridor, and sensitive lands
 - o Favorable: Zero or minimal impacts
 - o Neutral: Minor impacts
 - o Not Favorable: Major impacts

- Right-of-Way: Examines square footage of ROW acquisition and impacts to adjacent property
 - o Favorable: No acquisition, no impacts
 - o Neutral: Minimal acquisition, minor impacts or impacts can be mitigated
 - o Not Favorable: Major acquisition, major impacts

- Constructability: Examines impacts on traffic, safety, and overall duration of construction
 - o Favorable: Minimal impacts and duration
 - o Neutral: Medium impacts and duration
 - o Not Favorable: High impacts and duration

NOTICE OF PUBLIC HEARING
City of Happy Valley Planning Commission and City Council

Notice is hereby given that the City of Happy Valley Planning Commission and City Council will hold public hearings on the following dates in regard to proposed amendments to the 172nd Ave./190th Drive Corridor Management Plan (CMP).

Date & Time: Planning Commission, April 12, 2016 at 7:00 p.m.
City Council, May 3, 2016 at 7:00 p.m.

Hearing Location: City Hall, 16000 SE Misty Dr. Happy Valley, OR 97086;

File & Subject: CPA-04-16 (Amendments 172nd Ave./190th Drive CMP).

Proposal: Amendments to the CMP affecting planned road alignments of section of 172nd Ave. and the Troge Road extension.

Location: 172nd Ave./190th Drive Corridor – with particular attention at the 172nd Ave./Troge Rd. area.

Applicant: City of Happy Valley

Applicable Criteria: Applicable City Comprehensive Plan policies; and, applicable Sections of Title 16 (Development Code) of the City of Happy Valley Municipal Code.

Staff Contact: Michael D. Walter, Economic & Community Development Director
503-783-3800

Interested parties are invited to attend this hearing or to submit comments in writing prior to the meeting time. Written testimony may be submitted in advance or in person at the hearing. Those wishing to present verbal testimony, either pro, con, or to raise questions, will be asked to speak after presentation of the reports.

Testimony should pertain to the applicable criteria. The decision will be made in accordance with said criteria, and may be appealed to the Land Use Board of Appeals. Failure to raise an issue in writing prior to or before the close of the written comment period or failure to provide sufficient specificity at the public hearing to afford the decision-making body an opportunity to respond to the issue precludes appeal to the Land Use Board of Appeals based upon that issue. The applicant and any person who submits written comments shall receive notice of the decision.

The failure of the applicant to raise constitutional or other issues relating to proposed amendments without sufficient specificity to allow the decision-making body to respond to the issue precludes an action for damages in circuit court.

The decision-making criteria, application, and records concerning this matter are available at the City of Happy Valley City Hall at the above address during working hours (8:00 a.m. to 5:00 p.m. weekdays), please call for an appointment. For additional information, contact Michael D. Walter, Economic & Community Development Director, at the above address and phone number.

The meeting site is accessible to handicapped individuals. Assistance with communications (visual, hearing) must be requested 72 hours in advance by contacting Marylee Walden, City Recorder at the above phone number.