CITY OF BEND
SOUTHEAST AREA PLAN

MEETING AGENDA

Southeast Area Plan Advisory Committee Meeting #7

MEETING DATE: December 3, 2019

MEETING TIME: 5:15 – 8:15 PM

LOCATION: Bend-La Pine School District Education Center
520 NW Wall Street, Room #314, Bend

Objectives

- Discuss transportation analysis results
- Discuss water and sewer planning for the SE Expansion Area
- Introduce the infrastructure funding plan – purpose, scope, and potential strategies
- Discuss and direct preliminary code concepts

Agenda

1. **Welcome, Introductory Items** (Chair Sharon Smith) – 5 min
    a. Introductions
    b. Conflict of interest disclosures
    c. Approval of minutes from last meeting
2. **Public Comment** (Chair Sharon Smith) – 10 min

The amount of time to provide comments may be limited to three minutes per person, depending on the number of people wishing to comment. Additional time for public comments is also provided at the end of the agenda under Item #7.

3. **Agenda Overview and Where We Are in the Process** (Joe Dills) – 5 min
    a. Schedule review, upcoming meetings
4. **Transportation Analysis Results** (Matt Kittelson) – 45 min

This is an informational item for SEAPAC members to hear the results of the transportation model analysis conducted and learn about the process for achieving compliance with Oregon's Transportation Planning Rule (OAR 660-12).

    a. Briefing on model results
    b. Committee discussion

Accessible Meeting Information
This meeting/event location is accessible. Sign language interpreter service, assistive listening devices, materials in alternate format such as Braille, large print, electronic formats and CD Formats, or any other accommodations are available upon advance request. Please contact Damian Syrnyk meeting at dsyrnyk@bendoregon.gov, 541-312,4919. Providing, at least, 3 days' notice prior to the event will help ensure availability.

5. **Water and Sewer Infrastructure (**Damian Syrnyk) – 25 min

This is an informational item for SEAPAC members to receive an update on the process for planning the water and sewer system in the Southeast Expansion Area, including coordination with Avion Water.

   a. Staff briefing on the preliminary sewer plan and coordination with Avion Water
   b. Committee discussion

6. **Funding Plan (Part 1)** (Project Team) – 40 min

This is a discussion item for the committee members to learn about the purpose and scope of a Funding Plan and discuss potential strategies for the Southeast Area.

   a. Briefing from City staff
   b. Introduction to the Funding Plan
   c. Committee discussion

7. **Preliminary Code Concepts** (Joe Dills) – 40 min

This is a discussion and direction item for SEAPAC to provide input and direction regarding preliminary code concepts that will be used to implement the Southeast Area Plan. Following this discussion, staff will prepare a first draft of the SE Area Special Planned District code.

   a. Staff briefing
   b. Committee discussion and direction

8. **Public Comment** (Chair Smith) – 10 min

9. **Next steps**

   a. Announcements
   b. Next meeting date:
      - SEAPAC Meeting #8 – March 2019 (date tbd)
      - SEAP Open House #2 – April 2019 (date tbd)

Agenda Item No. 6:
Minutes from
SEAPAC #6,
September 26, 2019

Minutes

Southeast Area Plan Advisory Committee Meeting #6

Southeast Area Expansion Plan

September 26, 2019

Bend-La Pine School District Education Center
520 NW Wall Street, Room 314, Bend, Oregon

CITY OF BEND

Committee Members

Ken Atwell, *Member*
Kip Barrett, *Member* (absent)
Casey Bergh, *Member*
Sarah Bodo, *Member*
Butch Hansen, *Member*
William Hubbert, *Member*
Anthony Oddo, *Member* (absent)
Jeff Reed*, Member*
Jacob Schumacher, *Member*
Sharon Smith, *Chair*
Rachel Strickland, *Member*
Dixon Ward, *Member*
Rick Williams, *Member*
Steve Wilson, *Member*
Rachel Zakem, *Member*

City Staff

Nick Arnis, *Growth Management Director*
Russ Grayson, *Community Development Director*
Robin Lewis, *Transportation Engineer*
Karen Swirsky, *Senior Planner*
Damian Syrnyk, *Senior Planner*
Jenny Umbarger, *Administrative Support Specialist*

Consultants

Joe Dills, *Angelo Planning Group*
Matt Kittelson, *Kittelson & Associates*

1. Welcome, Introductory Items

Chair Smith called the meeting to order at 5:16pm**.**

Members introduced themselves and disclosed the following conflicts of interest:

- Chair Smith disclosed her employment with Bend-La Pine School District, which owns property within the Elbow
- Member Bodo disclosed her employment with Bend Park & Recreation District, which owns property within the Elbow
- Member Schumacher disclosed his ownership of property within the Elbow
- Member Hubbert disclosed his ownership of property within the Elbow
- Member Atwell disclosed his membership with the Southeast Bend Neighborhood Association

- Member Zakem disclosed her employment with Cascades East Transit
- Member Hansen disclosed his membership with the Old Farm District Neighborhood Association
- Member Williams disclosed his employment with Oregon Department of Transportation
- Member Ward disclosed his ownership of property within the Elbow
- Member Reed disclosed his ownership of property within the Elbow

Chair Smith requested a motion to approve the previous meeting's minutes. Member Hansen requested the spelling of his last name be corrected. A motion to approve the minutes with the clerical correction was made by Member Zakem and seconded by Member Hansen. Minutes were approved unanimously.

2. Public Comment

No public comment.

3. Agenda Overview, Where We Are in the Process, and Open House Debrief

Mr. Dills reviewed the Southeast Area Plan project process, as outlined in the presentation.

Mr. Syrnyk reviewed the results of the recent Open House, as outlined in the presentation. He also provided a brief presentation on the land use field trips from August. Members shared their observations while attending the land use field trips.

4. Land Use Plan

Mr. Dills reviewed the Refined Land Use Plan, as outlined in the presentation. Mr. Syrnyk shared emailed comments provided by Member Oddo. Member Smith recommended staff look at work being done on the Core Area Project (CAP) with regard to Mixed Employment (ME) areas. Member Atwell recommended staff look at code language regarding allowing land use designation swaps. Member Schumacher recommended the area zoned Residential Urban Low Density (RL) north of the Kelleher and Stevenson properties be changed from RL to Residential Urban Standard Density (RS). Member Hubbert recommended staff provide visuals of building style options. Member Wilson recommended policy language be drafted to encourage density averaging within a master plan.

A motion to approve the Refined Land Use Plan, Option D, for use in modeling in infrastructure master plan work, including the change from RL to RS noted above, was made by by Member Reed and seconded by Member Atwell. Motion was approved unanimously.

5. Transportation Plans and Coordination with Bend Transportation Plan Update

Mr. Dills reviewed the Refined Transportation Plan, as outlined in the presentation. Mr. Dills indicated rights-of-way will be designated at the time land is developed. Staff to work further on crossing network options. Member Hansen recommended considering alternatives to roundabouts at crossings.

A motion to approve the Refined Street Plan for use in modeling was made by Member Atwell and seconded by Member Williams. Motion was approved unanimously.

With regard to the Refined Trail Plan, staff to determine if trails will be on one side or both of the collectors, based on modeling.

A motion to approve the Refined Trail Plan for use in modeling was made by Member Smith and seconded by Member Wilson. Motion was approved unanimously.

Ms. Swirsky provided a progress report on Bend's Transportation System Plan (TSP) update project, as outlined in the presentation.

6. Alternative Collector Standard

Mr. Syrnyk reviewed Alternative Collector Standards, as outlined in the presentation. Ms. Lewis provided the committee with a portion of the draft Bikeway Design Guide 2019. Project team will continue refining this work based on SEAPAC input and bring back next iteration at next SEAPAC meeting.

7. Public Comment

Devin Jensen spoke about north-south collector options, crossing safety and neighborhood lighting standards.

8. Next steps

Mr. Dills adjourned the meeting at 7:45pm.

Respectfully submitted,

Damian Syrnyk
Jenny Umbarger
Growth Management Department

Accessible Meeting/Alternate Format Notification

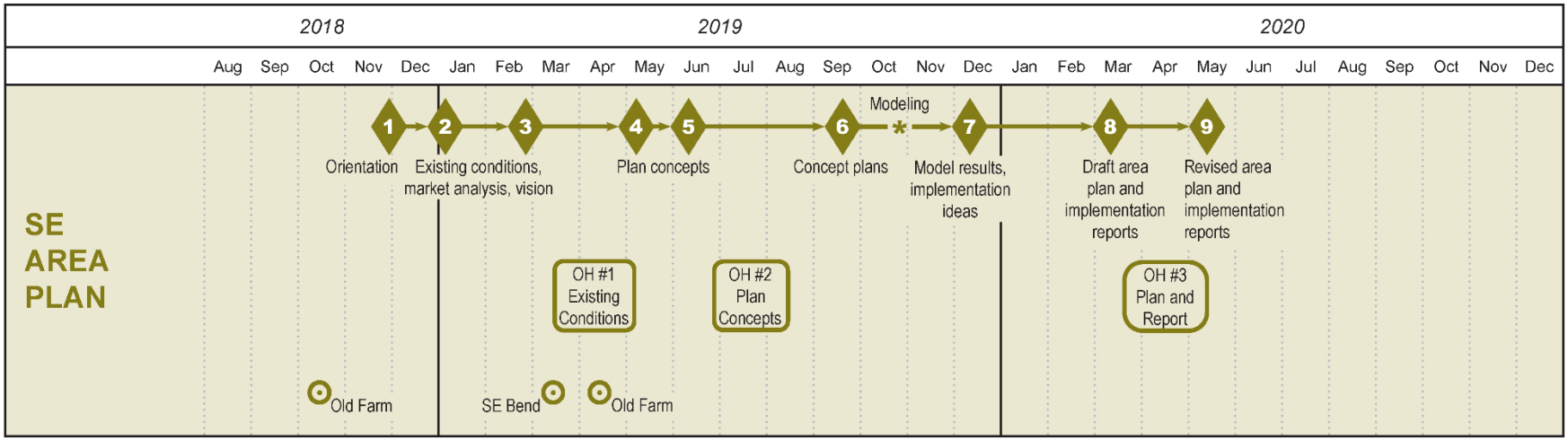
This meeting/event location is accessible. Sign and other language interpreter service, assistive listening devices, materials in alternate format such as Braille, large print, electronic formats, language translations or any other accommodations are available upon advance request at no cost. Please contact Jenny Umbarger no later than 24

hours in advance of the meeting at jeumbarger@bendoregon.gov, 541-323-8509, or fax 541-385-6676. Providing at least 3 days' notice prior to the event will help ensure availability.

Agenda Item No. 3:
Work Plan Diagram

BEND TRANSPORTATION AND LAND USE PROGRAM

Southeast Area Plan Work Plan and Process



Agenda Item No. 4:
Preliminary
Transportation
Infrastructure Needs
Memorandum

KITTELSON & ASSOCIATES
354 SW UPPER TERRACE DRIVE, SUITE 101
BEND, OR 97702
P 541.312.8300

MEMORANDUM

Date: November 26, 2019 Project #: 21926.12

To: Southeast Area Advisory Committee
Cc: City of Bend Staff
From: Matt Kittelson, PE, Julia Kuhn, PE, Bryan Graveline, & Jacki Gulczynski
Project: Southeast Area Plan
Subject: Preliminary Transportation Infrastructure Needs

This memorandum summarizes our preliminary transportation analysis of the impacts and needs associated with Refined Land Use Plan (Option D) for the Southeast Expansion Area. The purpose of this analysis is to identify potential transportation needs associated with buildout of the Urban Growth Boundary (UGB) expansion area. These infrastructure needs and findings may be refined as the outcomes are vetted through a multiagency review process.

BACKGROUND

The City of Bend has initiated a planning process for the Southeast Expansion Area to identify revisions to the adopted land use plan and the necessary infrastructure to support annexation of that land into the city. This memorandum summarizes an evaluation of the transportation needs associated with the refined land use plan.

ANALYSIS METHODOLOGY

This analysis can help inform the identification of specific projects and associated costs included in the forthcoming infrastructure plan for the UGB expansion area. The identified needs support the anticipated buildout of the Southeast Plan area over a 20-year horizon period. The team has worked with City of Bend staff to identify an appropriate study area to assess transportation needs. The following summarizes the intersections evaluated.

Intersections Evaluated:

- 15th St & Reed Market Rd
- 15th St & Ferguson Rd
- 15th St & Murphy Rd (Murphy Road Extension)
- 15th St & Knott Rd
- Country Club Rd & Murphy Rd
- Brosterhous Rd & Murphy Rd (Murphy Road Extension)
- US 97 NB Diverge at Murphy Road
- US 97 SB Merge at Murphy Road
- 27th St & Diamondback Ln
- 27th St & US 20
- 27th St & Reed Market Rd
- 27th St & Stevens Rd
- 27th St & Ferguson Rd
- 27th St & Rickard Rd
- US 97 SB Ramp & Knott Rd
- US 97 NB Ramp & Knott Rd
- China Hat Rd & Knott Rd
- Knott Rd & Country Club Dr
- Knott Rd & Brosterhous Rd
- Knott Rd & Raintree Ct
- Parrell Rd & China Hat Rd
- US 97 & China Hat Rd
- Magnolia Ln & Ferguson Rd
- 15th St & New Collector Road (Future intersection)
- Knott Road & Local Framework Road (Future Intersection)
- Knott Rd & New Collector Road (Future Intersection)

We evaluated these intersections under the following scenarios:

- **Existing Conditions (2019)**: This scenario evaluates the study intersections based on existing traffic volumes and traffic control. It is useful to identify intersections that exceed applicable mobility standards today. Results from this scenario are not presented in this memorandum because most intersections meet current mobility standards today.
- **Year 2040 No Build Scenario:** This scenario evaluates the study intersections based on existing traffic control assuming a 2040 land use scenario where Bend growth is NOT accommodated within the Southeast Area Plan boundaries. In other words, other areas of Bend and its surroundings grow MORE to account for a retention of rural zoning within the Southeast Area Plan study area. This scenario is for analysis purposes only and used to determine a baseline for transportation impacts.
- **Year 2040 Build Scenario:** This scenario evaluates the study intersections based on existing traffic control assuming a 2040 land use scenario consistent with the refined Land Use Plan, as proposed by the ongoing Southeast Area Plan process. This scenario is useful to determine transportation impacts relative to the Year 2040 No Build Scenario.

TRAVEL DEMAND MODELING

We utilized the Bend-Redmond travel demand model to estimate future year volume forecasts as well as to approximate the distribution of trips associated with the Southeast Area Plan lands. The travel demand model forecasts were used to estimate Year 2040 No Build Scenario traffic volumes assuming the Southeast Area Plan lands remain with the existing rural zoning. It was also used to generate and regionally distribute the potential Southeast Area Plan area trips to estimate Year 2040 Build Scenario assuming development of the areas consistent with the revised land use plan.

Based on these travel forecasts, we evaluated each study intersection to determine the ultimate intersection form necessary to support travel demand consistent with the Year 2040 Build Scenario. We have noted where intersection improvements are currently planned as part of City or other adopted plans. The following section describes the findings of this analysis.

YEAR 2040 INTERSECTION NEEDS & MITIGATION MEASURES

Figure 1 summarizes our preliminary transportation analysis findings based on the Year 2040 No Build Scenario and Year 2040 Build Scenario. This analysis assumes construction of the ongoing Murphy Road extension, including construction of roundabouts at the Murphy Road/Brosterhous Road and Murphy Road/15th Street intersections. It also assumes construction of a roundabout at the 15th Street/Knott Road intersection, which is programmed for construction in 2020.

As shown, the following study intersections were shown to exceed applicable mobility standards under all scenarios:

- 15th Street & Reed Market Road
- 15th Street & Ferguson Road
- Country Club Road & Murphy Road
- 27th Street & Ferguson Road
- US 97 SB Ramps & Knott Road
- US 97 NB Ramps & Knott Road
- China Hat Road & Knott Road
- Country Club Road & Knott Road
- Brosterhous Road & Knott Road

With the exception of 27th Street/Ferguson Road and the US 97/Knott Road interchange, all these intersections have previously been identified for improvement by a relevant planning study[1]. Table 1 presents necessary mitigation measures to address these needs. Figure 2 shows mitigation needs by intersection.

[1] Bend Transportation System Plan, City of Bend Transportation System Development Charge, in-process US 97 Parkway Study, or improvement conditioned as part of an approved development.

Table 1. Transportation Mitigation Measures to Address Intersection Needs under No Build and Build Scenarios

Intersection	Mitigation Measure[1]	Meets Mobility Standards?	Notes
15th Street & Reed Market Road	**Expand to Multi-lane Roundabout**	Yes	May require additional turn lanes
15th Street & Ferguson Road	**Partial Multi-lane Roundabout**	Yes	May require some multilane approaches
Country Club Road & Murphy Road	**Single-lane Roundabout**	Yes	Intersection design part of ongoing Murphy Road corridor project
27th Street & Ferguson Road	Single-lane Roundabout	Yes	-
US 97 SB Ramps & Knott Road	None	No	US 97/Knott Road interchange is subject to a forthcoming improvement study
US 97 NB Ramps & Knott Road	None	No	US 97/Knott Road interchange is subject to a forthcoming improvement study
China Hat Road & Knott Road	**Single-lane Roundabout**	Yes	-
Country Club Road & Knott Road	**Single-lane Roundabout**	Yes	-
Brosterhous Road & Knott Road	**Single-lane Roundabout**	Yes	-

[1]Previously identified mitigation measures identified in **bold**

The following additional intersections were shown to exceed applicable mobility standards assuming development of the Southeast Area Plan land use plan under their current intersection control and configuration:

- 27th Street & US 20
- 27th Street & Reed Market Road
- 27th Street & Diamondback Lane
- 15th Street & New Collector

Table 2 presents necessary mitigation measures to address these intersections needs. Figure 2 shows mitigation needs by intersection.

Table 2. Transportation Mitigation Measures to Address Intersection Needs under Build Scenario

Intersection	Mitigation Measure[1]	Meets Mobility Standards?	Notes
27th Street & US 20	**Intersection Improvement Project Identified in Bend TSP**	No	Mitigation measure to be coordinated with ODOT
27th Street & Reed Market Road	Multi-lane Roundabout	Yes	Intersection would serve as key access to DSL UGB expansion area
27th Street & Diamondback Lane	Single-lane Roundabout	Yes	New Collector Road & 27th Street connection
15th Street & New Collector	**Single-lane Roundabout**	Yes	New Collector Road & 15th Street intersection. Previously identified improvement as part of development applications.

[1]Previously identified mitigation measures identified in **bold**

SOUTHEAST AREA ROADWAY NETWORK ANALYSIS

Our transportation analysis also provides preliminary assessment of the function of the proposed Southeast Area Plan roadway network. The following summarizes key findings from that analysis:

- The planned north-south and east-west collectors are expected to be sufficient as 2-lane or 3-lane roads to accommodate the travel demand anticipated from the refined land use plan. These roadways should be supported by a robust network of connected local roads to provide a balanced use of the collector road network for all travel modes.
- The north-south road identified as a "framework local road" was found to be an important connection to support access to and from the commercial and residential lands near the intersection of 15th Street & Knott Road. Traffic volumes suggest the roadway would operate as a high volume local road or a low volume collector.
- Traffic volumes suggest intersections internal to the Southeast Area Plan will operate as side-street stop-controlled facilities, with the exception of the intersection of north-south and east-west collector road. That intersection may require a high order intersection form, such as a mini-roundabout or single-lane roundabout, based on future travel patterns. The project team will further explore this need as this analysis is refined.

PEDESTRIAN CROSSING CONSIDERATIONS

The location and type of pedestrian crossing treatments that could be included in the Southeast Area will depend heavily on adjacent land uses and roadway facility types. The Southeast Area Plan land use scenario is designed to promote pedestrian activity by way of creating complete neighborhoods and a robust multimodal transportation network.

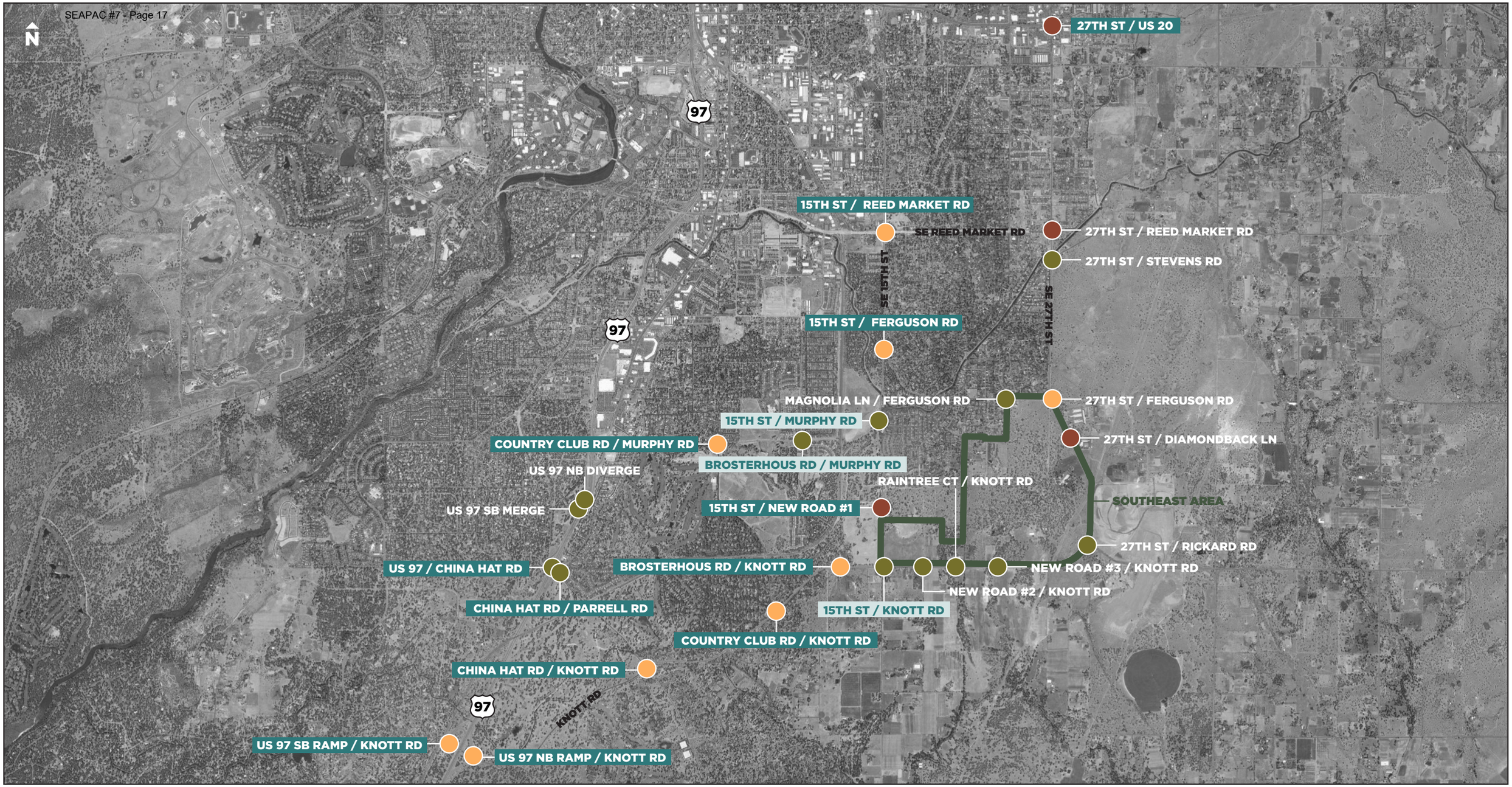
As development plans within the Southeast Area Plan become available, the following criteria should be considered when siting and design improved pedestrian crossings:

- Adjacent land uses
- Size and type of roadway
- Known or expected pedestrian travel patterns
- Proximity to improved intersection

In addition to these criteria, the selection of specific crossing types should consider current research and standards. For example, current crossing design should consider criteria included in *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations, FHWA, 2005*, which provides guidance on the selection of an appropriate crossing type given a variety of conditions.

NEXT STEPS TO IDENTIFY SOUTHEAST AREA PLAN INFRASTRUCTURE NEEDS

The project team is working with the City of Bend and ODOT to identify reasonable contributions from the Southeast Area Plan to address these intersection needs. The outcomes of those conversations will be presented to the advisory committee at a forthcoming Southeast Area Plan advisory committee meeting and included in the Infrastructure Funding Plan.

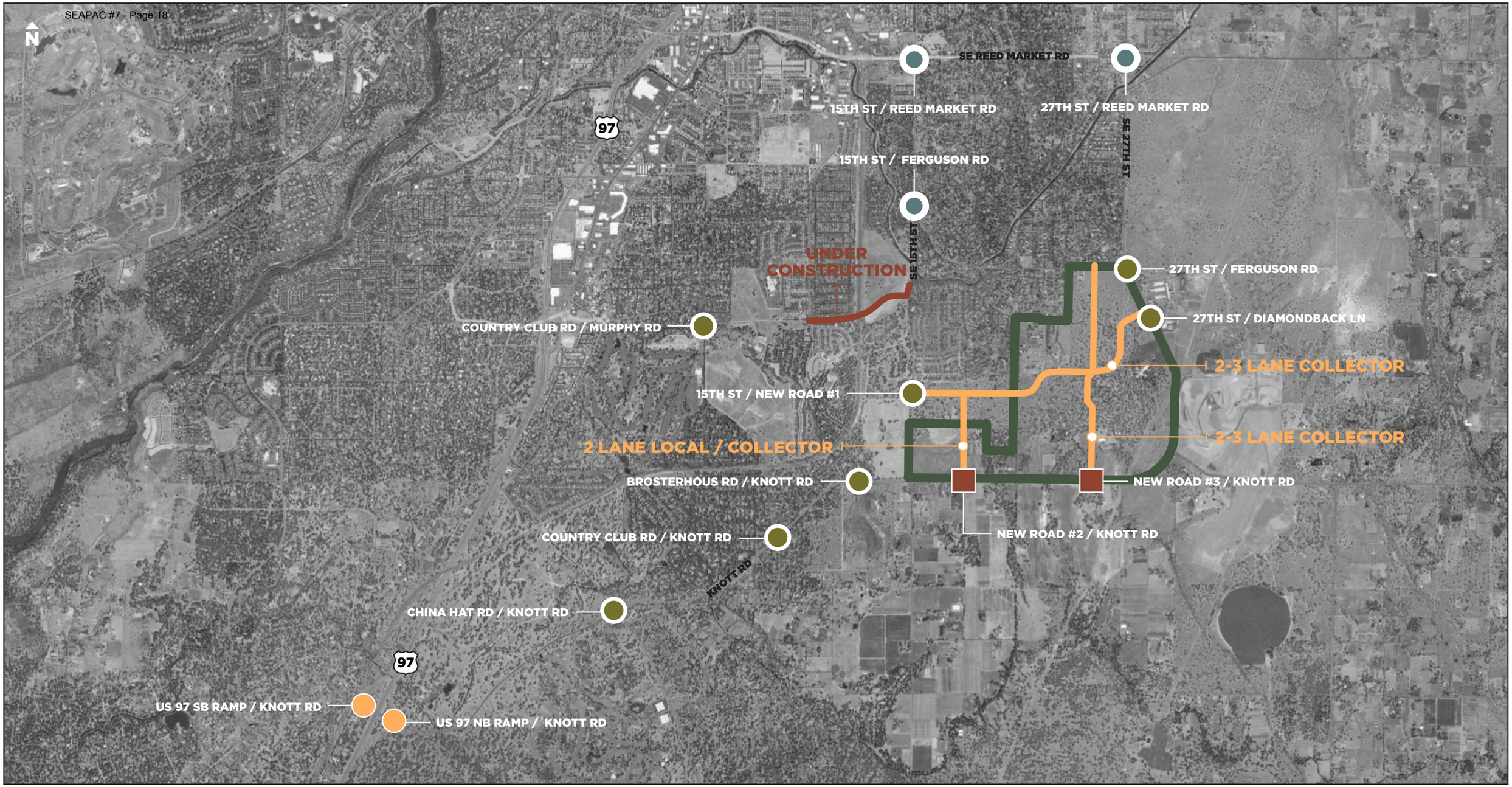


- Meets Mobility Standards In All Scenarios
- Exceed Mobility Standards In Build Scenarios
- Exceeds Mobility Standards In All Scenarios
- TEXT Currently Planned Intersection Improvement
- TEXT Improvement Currently Under Construction

Figure 1

DRAFT SEAP 2040 Operations Results

Bend, OR



- Single Lane Roundabout
- Multilane Roundabout
- Forthcoming IAMP
- Two-Way Stop Controlled
- Southeast Area Plan Boundary
- New Road

Figure 2

DRAFT SEAP 2040 Mitigation Measures

Bend, OR

Agenda Item No. 5:
Sewer Concept Plan
Memorandum

TECHNICAL MEMORANDUM

DATE: November 25, 2019

PROJECT: On-Call Modeling, Wastewater Collection

TO: City of Bend, Oregon

FROM: Sven MacAller, P.E.
Shad Roundy, P.E.

RE: Southeast Area Plan, Sewer Concept Plan

Background

The Southeast Area (also known as "The Elbow") in the City of Bend, Oregon (City) was identified in the 2016 Urban Growth Boundary (UGB) Expansion Study as a priority growth area. The area is approximately 480 acres and includes High Desert Park and High Desert Middle School. Boundaries of the Southeast Area include Knott Road to the south, 27th Street to the east, and the existing City limits to the north and west.

An area plan is being developed that includes land use/zoning, roadways, and sewer infrastructure. This technical memo outlines a concept for sewer infrastructure including gravity sewer and force main alignments and the location of a regional pump station. Preliminary sizing of infrastructure is also summarized. The sewer concept is based on land use data and roadway planning adopted by the Southeast Area Plan Advisory Committee (SEAPAC) on September 26, 2019 and verified with residential and employment data from the City's 2016 UGB Expansion Study.

Summary

The Southeast Area sewer infrastructure concept plan documented in this technical memorandum is summarized in Figure 1 and Table 1. The infrastructure plan includes six gravity collector sewers ranging in size from 8 to 18-inches, one regional pump station, and one 12-inch force main. Local neighborhood sewers are excluded from the plan. Based on topography, approximately 50-percent of the service area will be served by the regional pump station. Preliminary cost estimates are presented in Table 1. The cost estimates associated with the gravity sewer alignment 1 located in 15th Street are not discounted for work currently being performed by the Bend LaPine School District to extend gravity sewer service to future schools adjacent to 15th Street.

Figure 1- Sewer Concept Plan

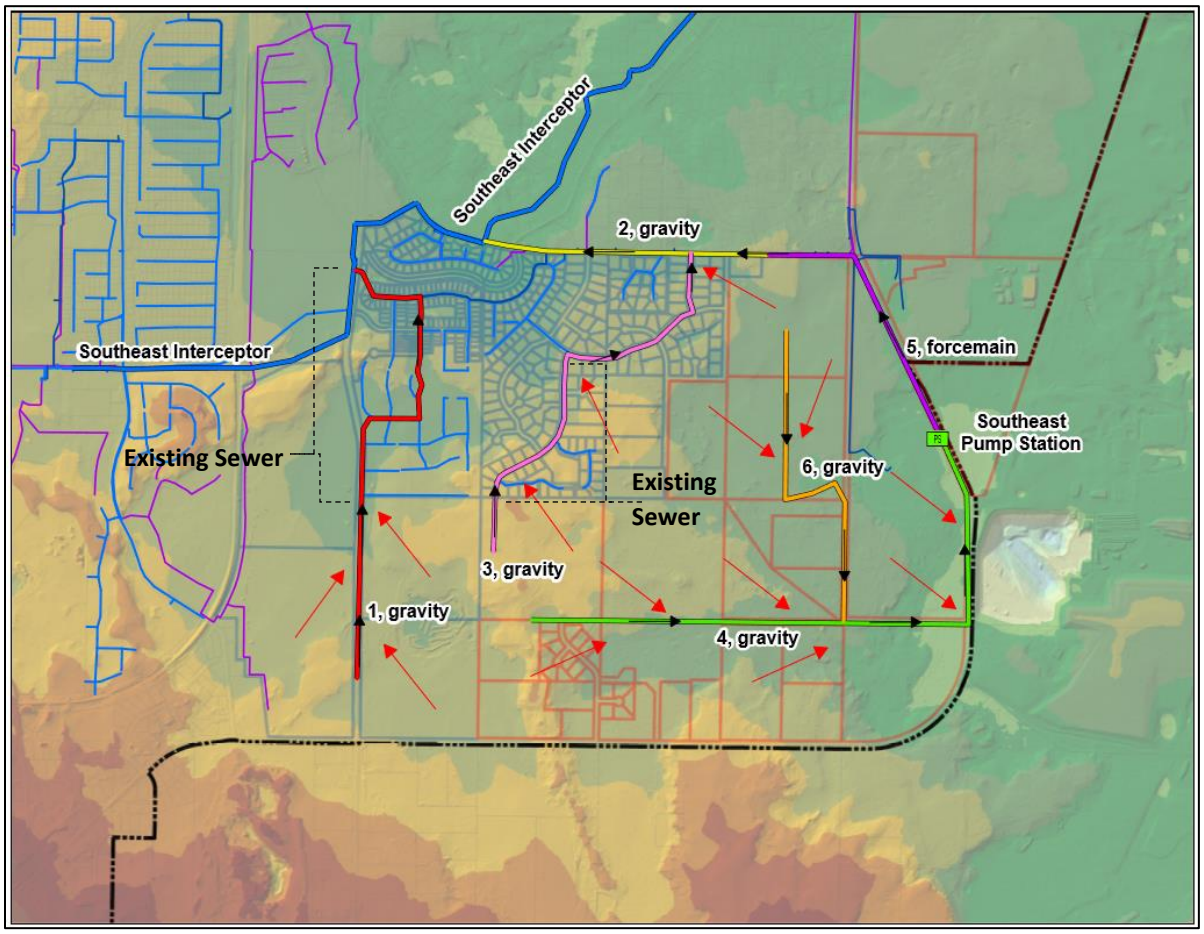


Table 1 - Sewer Infrastructure Summary and Costs

New Infrastructure	Preliminary Sizing (inches or gallons per minute, gpm)	Length (feet)	Cost Estimate, Low Markup ($million)[1]	Cost Estimate, High Markup ($million)[1]
1, gravity[2, 3]	8-inch, 12-inch	1,650 8-inch, 1,500 12-inch	1.2	1.8
2, gravity	18-inch	3,100	1.3	1.9
3, gravity[3]	8-inch	2,700	1.3	1.9
4, gravity	8-inch, 12-inch	3,350 8-inch, 3,550 12-inch	2.8	4.1
5, force main	12-inch	3,200	1.3	1.8
6, gravity	12-inch	4,100	1.8	2.7
Pump Station	1,250 gpm	n/a	3.5	5.1
Total			13.2	19.3

Table 1 Notes:

Note 1. All cost estimates are Class 5 budget estimates in millions of dollars, as established by the *American Association of Cost Engineers*. This preliminary estimate class is used for conceptual screening and assumes project definition maturity level below two percent. The expected accuracy range is -20 to -50 percent on the low end, and +30 to +100 percent on the high end. The cost estimates are consistent with the definition of OAR 660-011-0005(2) and OAR 660-011-035. Cost estimates are intended to be used as guidance in establishing funding requirements at the project planning level based on information available at the time of the estimate. Estimates exclude land acquisition, financing, and inflation. Low markup is a factor of 2.1 times labor and material costs. High markup is a factor of 3.1 times labor and material costs. Cost estimates were performed in 2019 dollars based on The Engineering News Record Construction Cost Index (ENR CCI) basis of 12026.45 (February 2019).

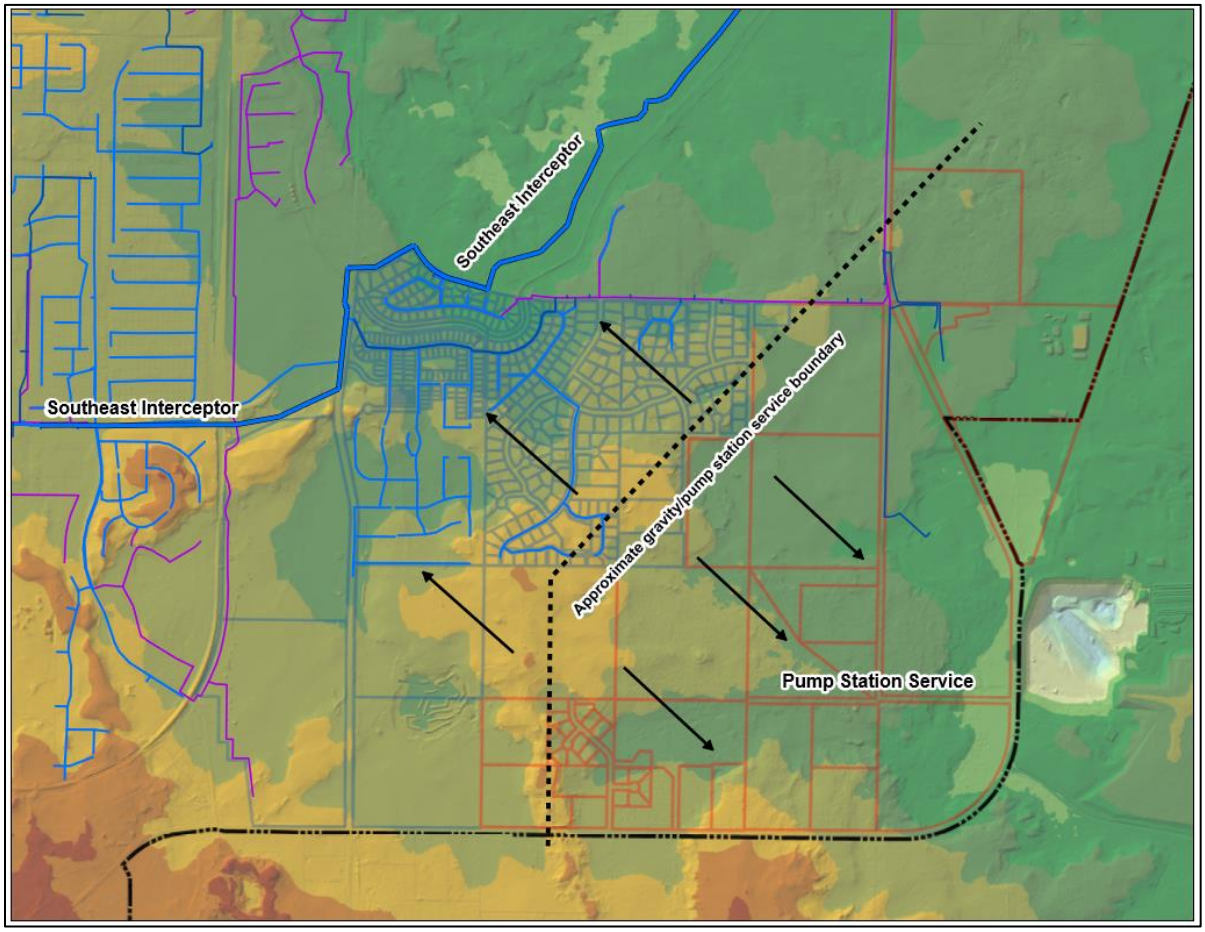
Note 2. The cost estimates associated with the gravity sewer alignment 1 located in 15th Street are not discounted for work currently being performed by the Bend LaPine School District to extend gravity sewer service to future schools adjacent to 15th Street.

Note 3. Alignments 1 and 3 connect to existing piping. The existing piping is excluded from the length and cost estimates unless an upsize is required.

Topography and Sewer Service Overview

The Southeast Area will be served by the Southeast Interceptor. Due to topography, some of the area will be served via gravity while other portions will be served by a regional pump station. A ridge splits the area approximately in half from the southwest corner to the northeast corner. Areas north and west of this boundary can be served via gravity sewers while areas to the south and east of the boundary will be served via pump station. Figure 2 illustrates the general ground surface topography and approximate boundary between gravity and pump station service areas.

Figure 2 – Topography and Service Overview



Sewer Infrastructure

Sewer infrastructure will utilize the road corridors approved by SEAPAC on September 26th 2019. Figure 3 shows the sewer infrastructure concept with numbering for each sewer alignment. Sewer alignments 1 and 3 will serve the area via gravity. Alignment 1 currently connects to the Southeast Interceptor. An extension of the existing gravity pipeline will serve the future middle and high schools as well as any other development along 15th Street. The Bend LaPine School District is responsible for funding a portion of Alignment 1 and the concept presented in this plan should be coordinated with their work. Alignment 3 will serve existing properties on Sky Harbor Drive and future development south of

Miramar Drive. The sewer improvement will connect to existing 8-inch piping in Sky Harbor Drive extending the pipeline further south by approximately 500 feet. The sewer improvement also includes new piping on Via Sandia Street and Cottonwood Drive connecting the existing Sky Harbor Drive pipeline to the new collector sewer on Ferguson Road (alignment 2).

Alignment 2 will be a gravity sewer that extends from the high elevation point on Ferguson Road to King Solomon Lane where it will connect to the South East Interceptor. This sewer will convey flow from sewer alignment 2 as well as flow from the South East Area Pump Station. The Ferguson Road sewer will also be used to decommission the existing Camden and Ridgewater Pump Stations.

A pump station is required to serve the southeastern portions of the area. Two gravity sewers will contribute flow to the Southeast Pump Station, alignment 6 and alignment 4. The pump station will be located just east of the High Desert Middle School on SE 27th Street. The force main will continue north on SE 27th and turn west on Ferguson Road before connecting to the gravity sewer (alignment 2) on Ferguson Road. This pump station location may also serve portions of the DSL property, another UGB expansion area.

An overview of sewer alignments is shown in Figure 3. Figure 3 includes the transportation infrastructure plan as a background layer, while Figure 4 includes a ground surface elevation background layer. Black arrows on both figures indicate flow direction, while the red arrows on Figure 3 indicate general direction of sewer service.

Figure 3 – Preliminary Sewer Service Overview

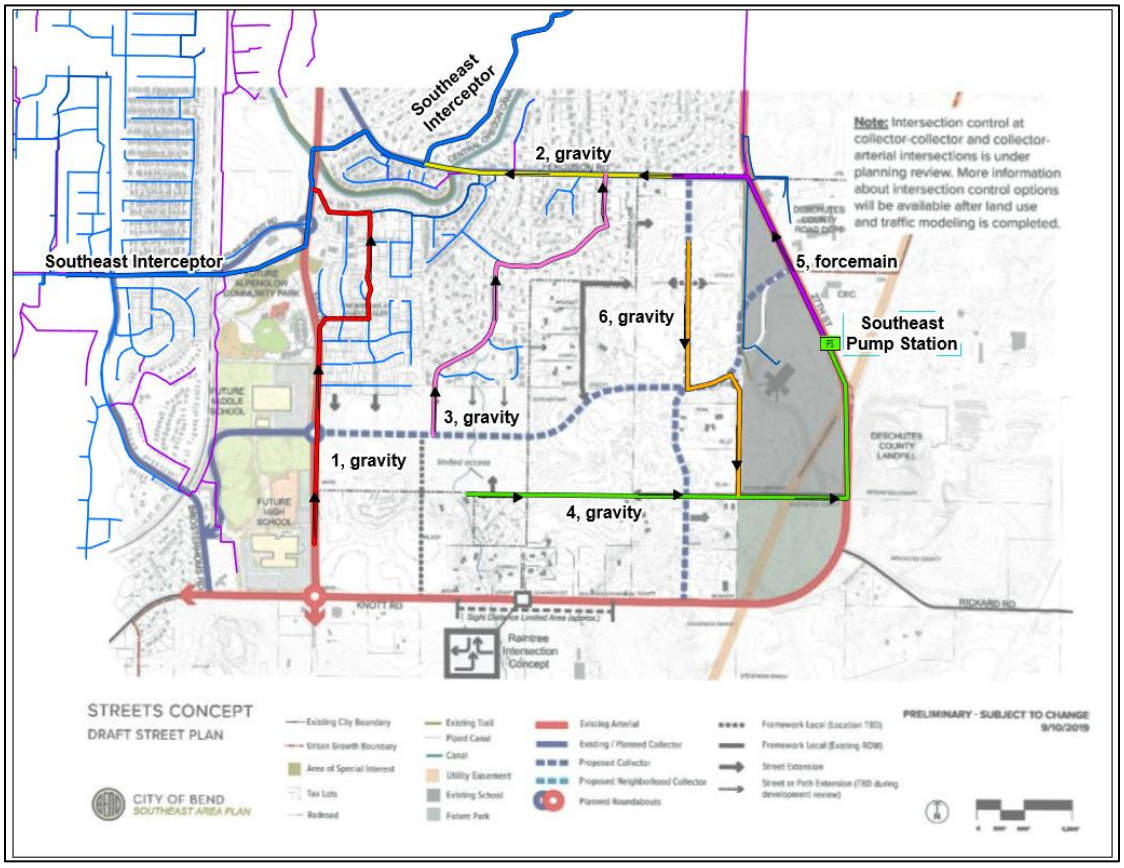
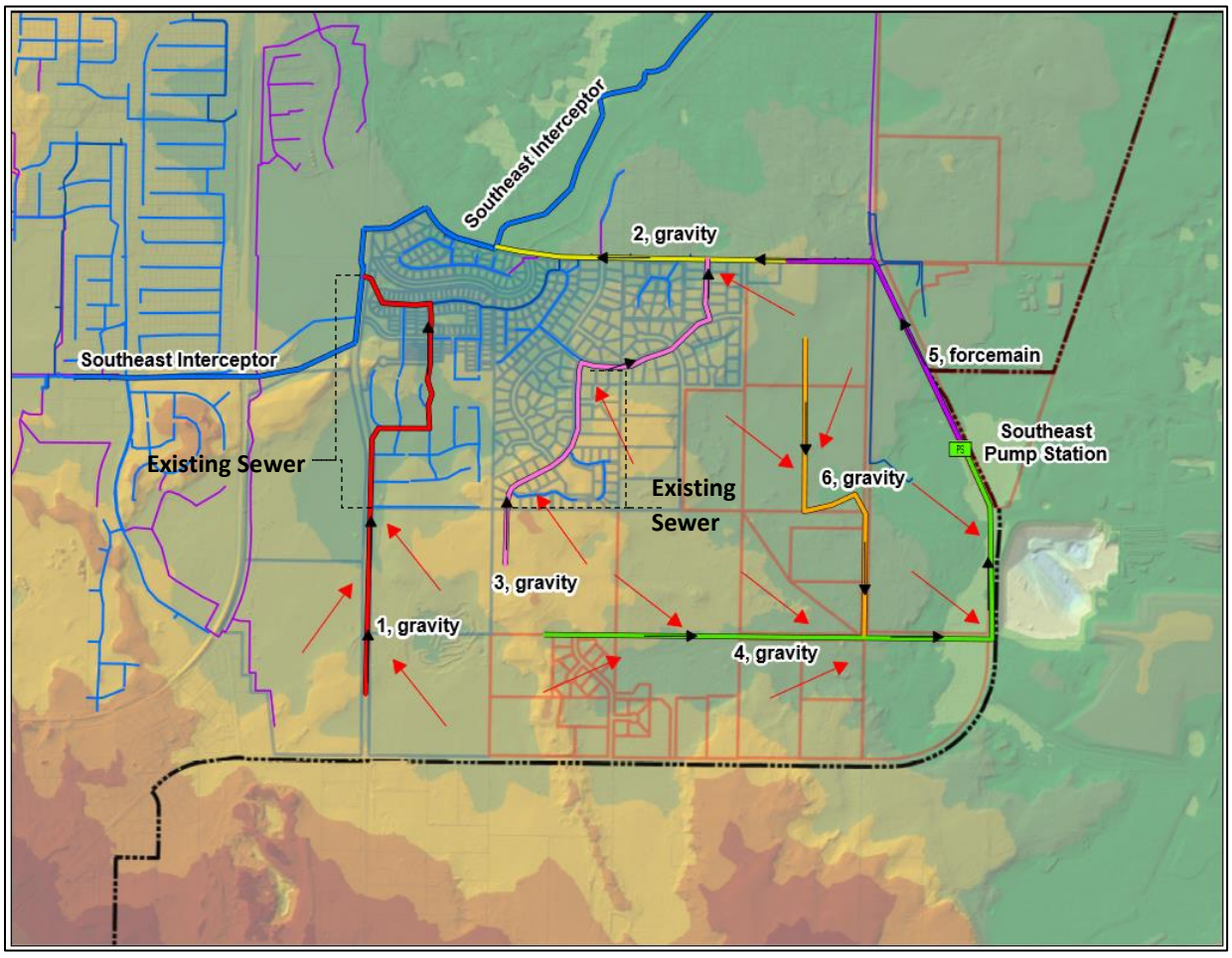


Figure 4- Preliminary Sewer Service Overview



Flow Rates and Infrastructure Sizing

Flow rates are based on land use/zoning approved by SEAPAC on September 26th 2019 and confirmed with assumptions from the City's 2016 UGB Expansion Study and 2018 Collection System Public Facility Plan Update. Average dry weather flow rates are calculated based on household or employment density per acre multiplied by unit flow factors of 130 gallons per housing unit per day and 45 gallons per employee per day. School properties were reviewed to ensure a minimum of 350 gallons per acre per day flow rate. Household and employment densities were adjusted to comply with total households and employees identified for the Elbow from the City's 2016 UGB Expansion Study (820 households and 2,290 employees). A peaking factor of 1.7 was used for average flow to peak dry weather flow, and a factor of 4 was used for average flow to peak wet weather flow. In addition to the design peak wet weather flow rate, a low flow dry weather and maximum build-out peak wet weather flow were developed to evaluate sewer infrastructure under low and high flow scenarios. The low dry weather flows were developed using planned vacancy within the service area. The high wet weather flow was developed using maximum zoning densities. The low and high flow scenarios are used for a sensitivity analysis to check for low scour velocities and surcharging of infrastructure during peak wet flow conditions. Table 2 provides a summary of flow rates and sizing calculated for each sewer line and the force main. Pipes were sized to convey the design peak wet weather flow without surcharging.

Table 2 – Flow and Sizing Summary

Alignment	Sizing (inches or total dynamic head, TDH)	Average Flow (gpm)	Peak Dry Weather Flow (gpm)	Design Peak Wet Weather Flow (gpm)	Low Dry Weather Flow (gpm)	Buildout Max Peak Wet Weather Flow (gpm)
1, gravity[1]	8-inch and 12-inch	100	180	400	155	425
2, gravity (includes flow from Pump Station and Profile 3)	18-inch	325	590	1,300	615	1,990
3, gravity[1]	8-inch	40	70	160	80	160
4, gravity	8-inch	60	100	225	150	200
4, gravity (downstream of 6)	12-inch	130	240	5,300	255	1,030
5, force main[2,3]	12-inch	280	500	1,250	520	1,800
6, gravity	12-inch	75	140	300	105	840
Pump Station[2]	67-77 feet TDH[4]	280	500	1,250	520	1,800

Note:
1, Sizing refers to new infrastructure, existing infrastructure remains “as-is”
2, Includes additional flow from DSL property
3, Force main sized to convey 1,250 gpm at 3.5 feet per second
4, Total dynamic head may vary based on wet well depth

Sewer Profiles

Sewer profiles have been developed for each sewer alignments. Profiles include a ground surface and hydraulic grade line for peak dry and peak wet weather flow. Profiles have been developed to reduce overall depth while still meeting minimum slope requirements and allow for connections to existing infrastructure or pump station decommissioning. Profiles are shown for each alignment in Appendix 1.

Preliminary Cost Estimates

Cost estimates for the sewer infrastructure were developed. Preliminary costs are planning-level estimates using the approach from the Public Facility Plan Update (2018) and UGB Expansion Study (2016). All cost estimates are Class 5 budget estimates, as established by the *American Association of Cost Engineers*. This preliminary estimate class is used for conceptual screening and assumes project definition maturity level below two percent. The expected accuracy range is -20 to -50 percent on the low end, and +30 to +100 percent on the high end. The cost estimates are consistent with the definition of OAR 660-011-0005(2) and OAR 660-011-035. Cost estimates are intended to be used as guidance in establishing funding requirements at the project planning level based on information available at the time of the estimate. Estimates exclude land acquisition, financing, and inflation. Cost estimates were performed in 2019 dollars based on *The Engineering News Record Construction Cost Index* (ENR CCI) basis of 12026 (February 2019).

Unit cost rates include materials, installation, and surface restoration in three categories (arterial, local, and dirt). Unit installation and material costs vary by both pipe diameter and depth. Unit cost markups are included for design and administration costs, mobilization, traffic control, erosion control, and contractor's overhead.

Some capital projects include significant unknowns at a planning level assessment. To account for unknowns related to canal crossings, and rock blasting, capital projects are given a cost estimate range representing standard and above average markups. These markups are presented in Table 3.

Table 3
Unit Cost Markups

Markup Category	Markup
Design and Administration	30%
Construction Mobilization	10%
Traffic Control and Erosion	9%
Contractor Overhead and Profit	15%
Subtotal	64%
Construction Contingency Low End	30%
Construction Contingency High End	80%
Overall Markup	2.1 (low) to 3.1 (high)

Preliminary cost estimate ranges for the Southeast Area sewer infrastructure concept are presented in Table 4. The cost estimates associated with the gravity sewer alignment 1 located in 15th Street are not discounted for work currently being performed by the Bend LaPine School District to extend gravity sewer service to future schools adjacent to 15th Street.

Table 4
Sewer Concept Preliminary Cost Estimates

New Infrastructure	Preliminary Sizing (inches or gpm)	Length (feet)	Cost Estimate, Low Markup ($million)[1]	Cost Estimate, High Markup ($million)[1]
1, gravity[2, 3]	8-inch, 12-inch	1,650 8-inch, 1,500 12-inch	1.2	1.8
2, gravity	18-inch	3,100	1.3	1.9
3, gravity[3]	8-inch	2,700	1.3	1.9
4, gravity	8-inch, 12-inch	3,350 8-inch, 3,550 12-inch	2.8	4.1
5, force main	12-inch	3,200	1.3	1.8
6, gravity	12-inch	4,100	1.8	2.7
Pump Station	1,250 gpm	n/a	3.5	5.1
Total			13.2	19.3

Table 4 Notes:

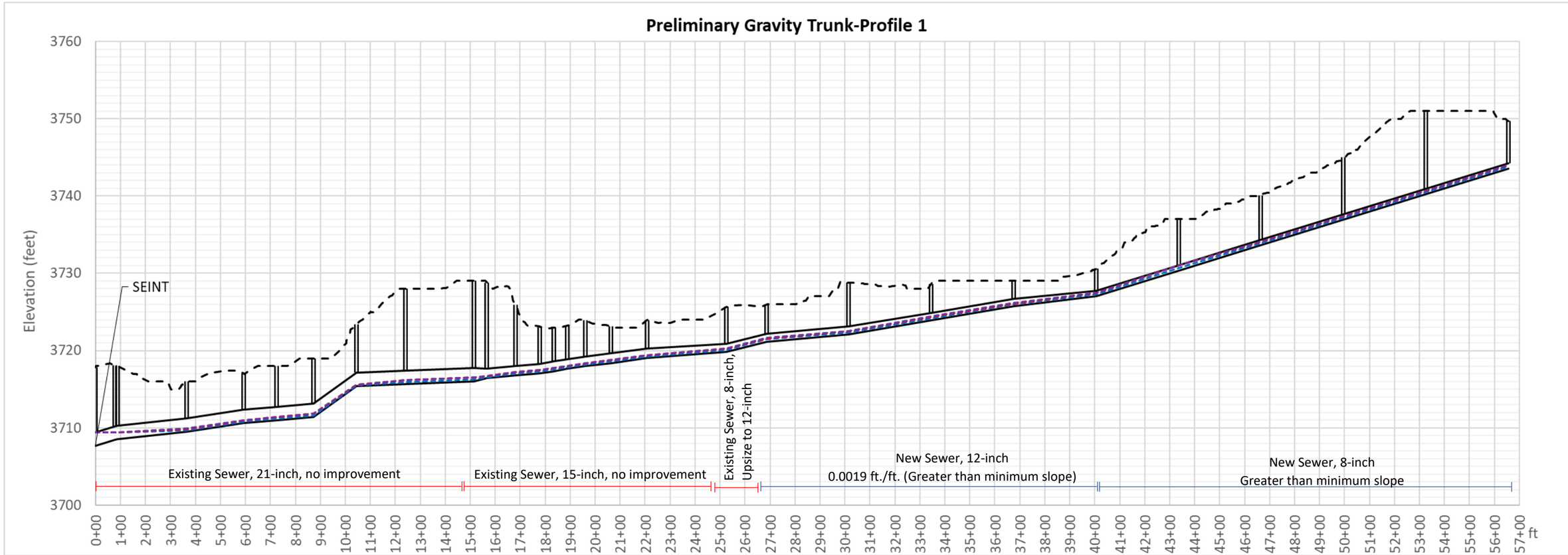
Note 1. All cost estimates are Class 5 budget estimates in millions of dollars, as established by the *American Association of Cost Engineers*. This preliminary estimate class is used for conceptual screening and assumes project definition maturity level below two percent. The expected accuracy range is -20 to -50 percent on the low end, and +30 to +100 percent on the high end. The cost estimates are consistent with the definition of OAR 660-011-0005(2) and OAR 660-011-035. Cost estimates are intended to be used as guidance in establishing funding requirements at the project planning level based on information available at the time of the estimate. Estimates exclude land acquisition, financing, and inflation. Low markup is a factor of 2.1 times labor and material costs. High markup is a factor of 3.1 times labor and material costs. Cost estimates were performed in 2019 dollars based on The Engineering News Record Construction Cost Index (ENR CCI) basis of 12026.45 (February 2019).

Note 2. The cost estimates associated with the gravity sewer alignment 1 located in 15th Street are not discounted for work currently being performed by the Bend LaPine School District to extend gravity sewer service to future schools adjacent to 15th Street.

Note 3. Alignments 1 and 3 connect to existing piping. The existing piping is excluded from the length and cost estimates unless an upsize is required.

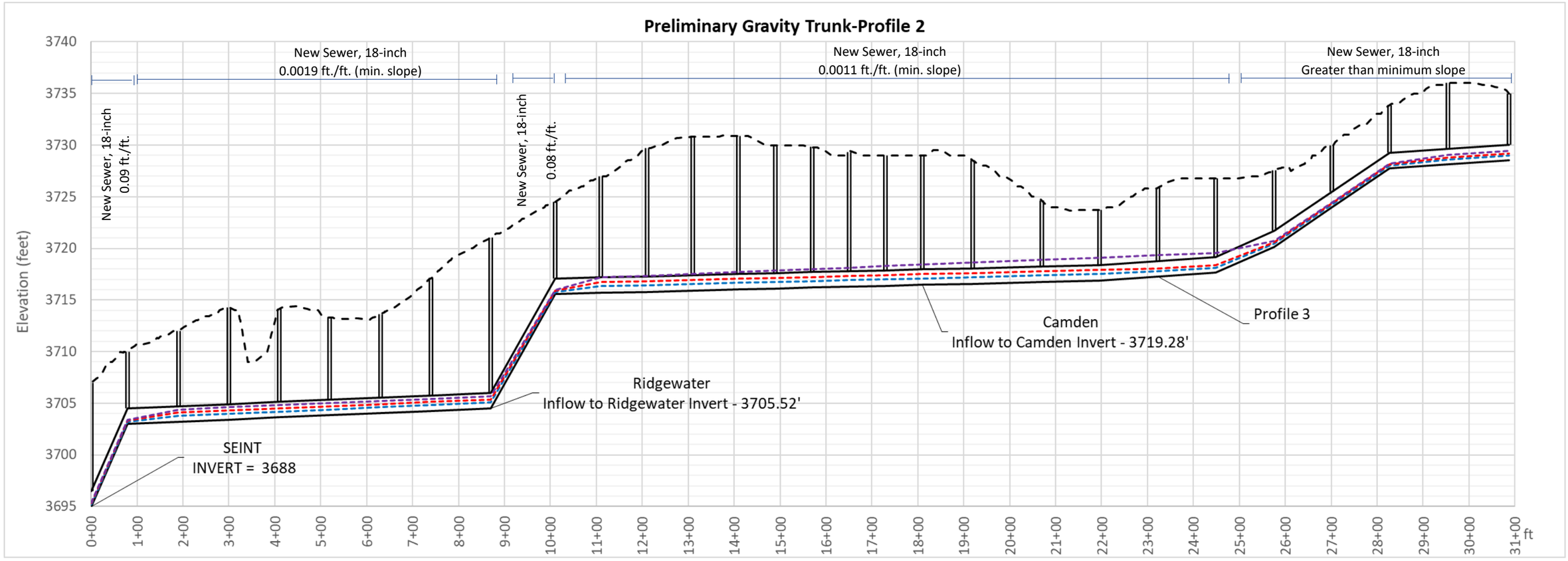
Appendix 1 – Sewer Profiles

Red line indicates design peak wet weather flow hydraulic grade line
Blue line represents low flow dry weather hydraulic grade line, used for scour velocity sensitivity analysis
Purple line represents a full build out condition, used for sizing sensitivity analysis



Flow Scenario	Min d/D	Max d/D	Min Vel. (fps)	Max Vel. (fps)
DWF	0.1	0.4	1.3	3.0
Peak WWF	0.1	0.6	1.8	4.3
Build Out Sensitivity Analysis	0.1	0.7	1.8	4.5

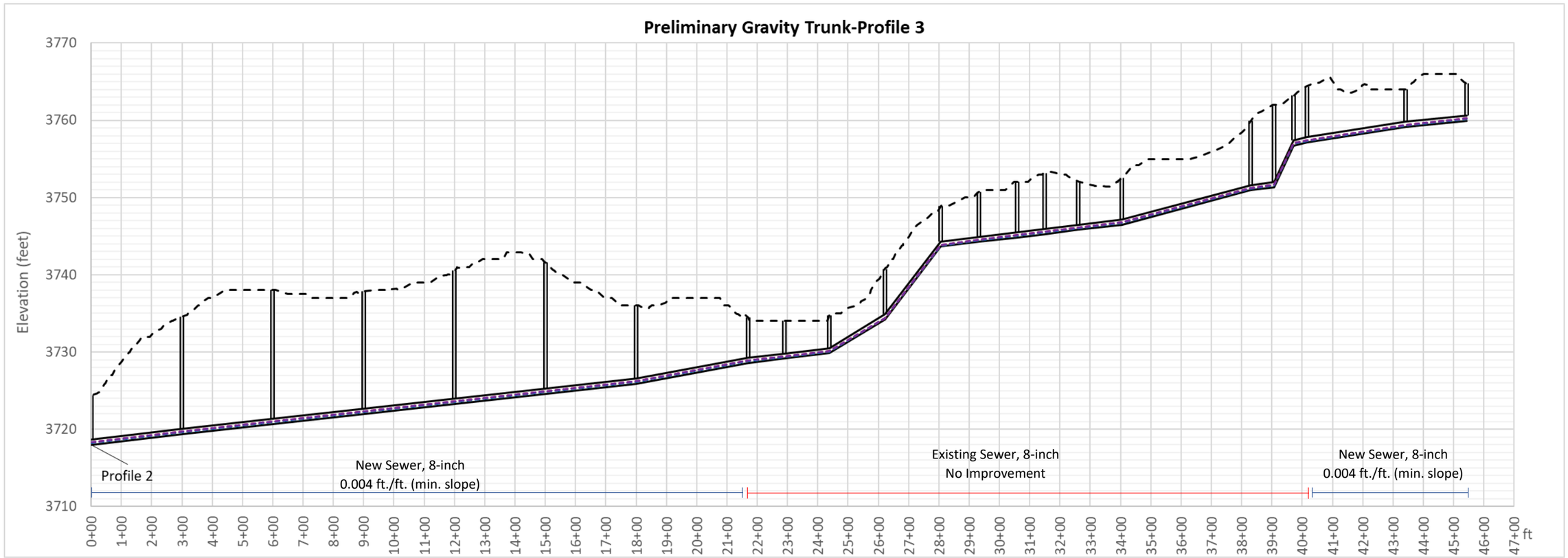
Comments- Low velocities are in the existing portion of this alignment sized at 21-inches. New infrastructure has velocity of 2.5 to 3 fps under peak dry weather flow conditions. Gravity alignment 1 will serve future middle and high schools as well as any other development along 15th Street. The Bend LaPine School District is responsible for funding a portion of Alignment 1 and the concept presented in this plan should be coordinated with their work.



Flow Scenario	Min d/D	Max d/D	Min Vel. (fps)	Max Vel. (fps)
DWF	0.1	0.4	1.8	8.6
Peak WWF	0.2	0.7	2.2	11.8
Build Out Sensitivity Analysis	0.3	d/D > 1.0, surcharging < 1 ft	2.5	13.5

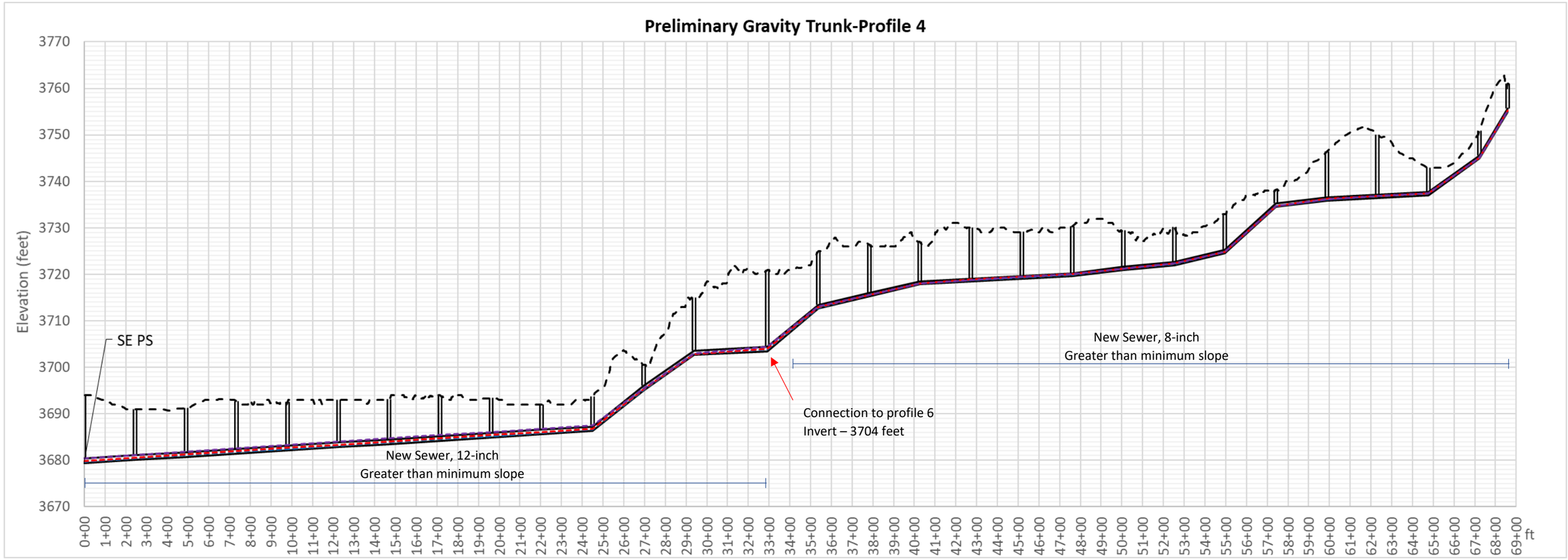
Comments- Alignment is driven by decommissioning of Ridgewater lift station and trying to minimize depth. Low velocities are in the middle section of the profile with slope of 0.0011 ft./ft. Slope could be increased but would result in increased depth (greater than 15 ft.).

Infrastructure is sized to prevent surcharging using flow rates developed from planned population and employment for the Elbow (red hydraulic gradeline). The buildout sensitivity scenario includes flow rates generated assuming maximum population and employment density within the service area. This scenario is used to verify that infrastructure is sized adequately to prevent excessive surcharging for any potential redevelopment in the future (purple hydraulic gradeline).



Flow Scenario	Min d/D	Max d/D	Min Vel. (fps)	Max Vel. (fps)
DWF	0.2	0.4	1.4	3.9
Peak WWF	0.3	0.5	2.1	5.6
Build Out Sensitivity Analysis	0.3	0.5	2.1	5.6

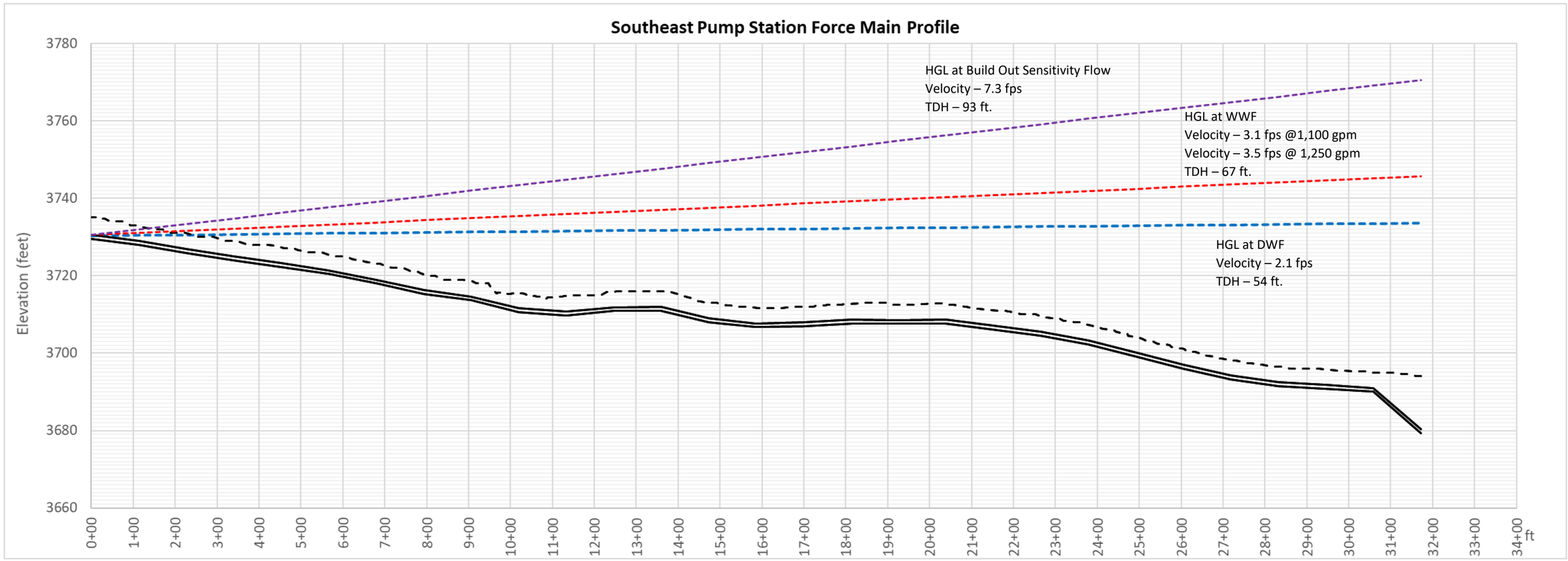
Comments- Velocity could be increased with increased slope, result would be increased depth (greater than 17feet).



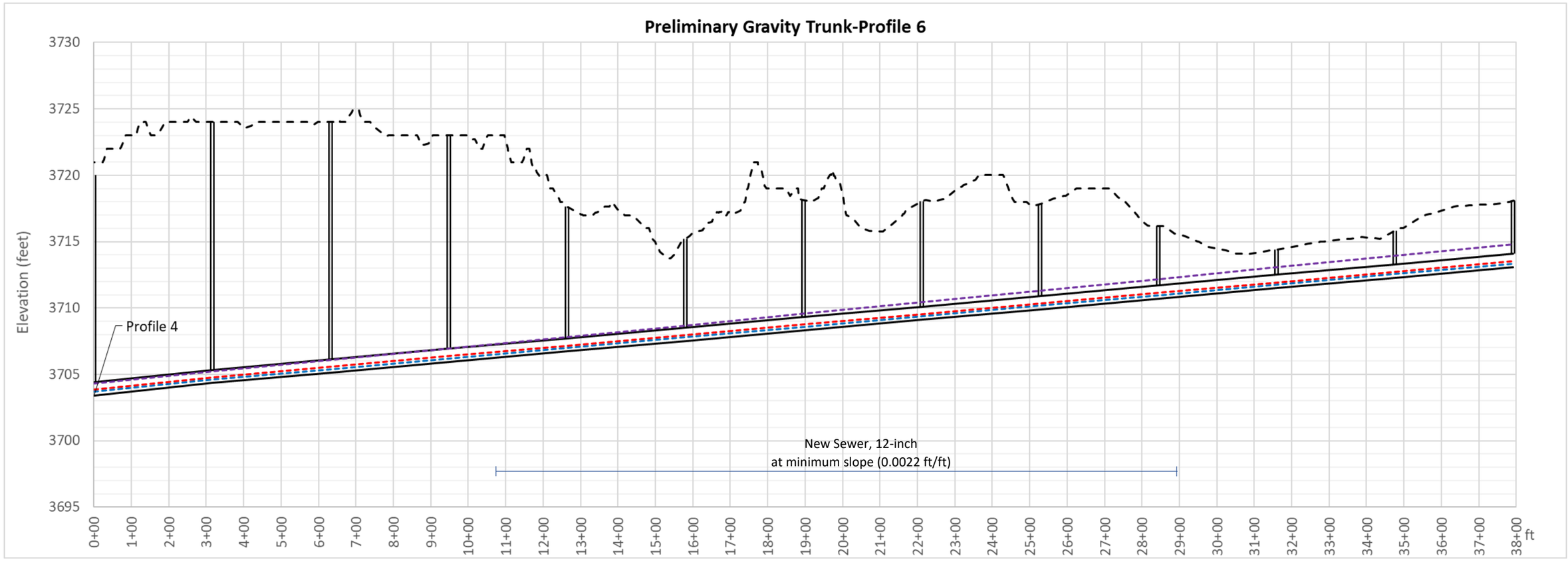
Flow Scenario	Min d/D	Max d/D	Min Vel. (fps)	Max Vel. (fps)
DWF	0.2	0.5	1.7	6.2
Peak WWF	0.3	0.7	1.8	6.8
Build Out Sensitivity Analysis	0.3	d/D > 1.0, surcharging < 1 ft	2.5	13.5

Comments- Profile is driven by need to connect with profile 6 and desire to reduce depth. Velocity could be improved in both profile 4 and profile 6, this would result in increased depth for both profiles (greater than 17 feet for profile 4)

Infrastructure is sized to prevent surcharging using flow rates developed from planned population and employment for the Elbow (red hydraulic gradeline). The buildout sensitivity scenario includes flow rates generated assuming maximum population and employment density within the service area. This scenario is used to verify that infrastructure is sized adequately to prevent excessive surcharging for any potential redevelopment in the future (purple hydraulic gradeline).



Diameter (nominal, inches)	Flow Rate (gpm)	Total Dynamic Head (TDH, ft)	Velocity (fps)
12	1250	67-77 (dependent on wet well depth)	3.5



Flow Scenario	Min d/D	Max d/D	Min Vel. (fps)	Max Vel. (fps)
DWF	0.17	0.3	2	2
Peak WWF	0.31	0.4	2	2
Build Out Sensitivity Analysis	0.52	d/D > 1.0, surcharging < 1 ft	2	3

Comments- Profile 6 could be re-routed further east, potentially along Diamondback Ln to reduce depth at downstream end.

Infrastructure is sized to prevent surcharging using flow rates developed from planned population and employment for the Elbow (red hydraulic gradeline). The buildout sensitivity scenario includes flow rates generated assuming maximum population and employment density within the service area. This scenario is used to verify that infrastructure is sized adequately to prevent excessive surcharging for any potential redevelopment in the future (purple hydraulic gradeline).

Agenda Item No. 1:
Draft Funding Plan
Annotated Outline

Southeast Expansion Area Funding Plan

Annotated Outline and Working Draft

PREPARED FOR: City of Bend

PREPARED BY: Lorelei Juntunen, Matt Craigie, and Sadie DiNatale, ECONorthwest

DATE: November 25, 2019

Overview

This memorandum is an annotated outline and initial working draft of the Southeast Expansion Area Funding Plan. Currently, the document outlines infrastructure funding strategies at a high-level. Where data is available, it provides costs estimates by infrastructure type and revenue projection tables to illustrate the direction of this plan. The draft is being provided to the Southeast Area Plan Advisory Committee (SEAPAC) as information and opportunity for early feedback.

- *Annotations are shown as highlighted and italicized. These sections will be further developed in subsequent drafts.*

Funding Plan for the SE Expansion Area

This Funding Plan provides direction about how to fund the projects identified in the Southeast Expansion Area Plan. This chapter includes important contextual information, methods used in the analysis, and proposed funding strategies and plans by infrastructure type. Where possible, the chapter identifies phasing and "development triggers" for infrastructure improvements.

Introduction

Expansion areas need backbone infrastructure to catalyze development, which can be expensive to provide. Expansion areas have unique funding challenges. Typically, System Development Charges (SDCs) are relied on to pay for infrastructure capital projects. However, SDCs only apply to projects listed in the adopted SDC methodology. Also, SDC funding in expansion areas is often insufficient to cover funding gaps as they are highly competitive resources used for other capital projects across the City. For more costly infrastructure improvements, this situation can present a causality dilemma and phasing challenge: these major improvements are needed before development can occur, but typically cannot be constructed without the developer contributions to pay for the infrastructure in the first place. Improvements paid solely by the developer alleviates this dilemma, but—due to scale and cost—not all improvements can be carried by a single project or property owner.

The purpose of this Funding Plan is to describe and organize an approach that addresses funding and phasing concerns to guide development in the SE Expansion Area. The intent is to: (1) clarify how infrastructure will be delivered and funded; and, (2) coordinate investments across a range of public and private partners who will be involved in funding the capital projects needed to allow development of the SE Expansion Area to occur. This plan outlines

infrastructure funding needs with identified actions and funding resources to address the needs in the SE Expansion Area, over the 2020–2040 planning period.

Methods

This Funding Plan was created through a collaborative process, involving the consultant team, City staff, and service providers responsible for building and maintaining infrastructure in the SE Expansion Area. The process identified infrastructure improvements (i.e. transportation, sewer, and water), their costs, and funding options.

This process was iterative, but generally followed these steps:

- **Land use scenario:** Land use and development assumptions, by plan designation, were provided by Envision. This data provided a basis for revenue projections.
- **Infrastructure analysis:** Project cost estimates were collected for each of the infrastructure types addressed in this plan (i.e. transportation, sewer, and water). Cost estimates for the project were provided by Kittelson & Associates, Inc.; Murraysmith, Inc.; and the City for the Southeast Area Plan area in Avion Water's service area.
- **Basic revenue forecasting:** Projects to estimate the amount of revenue that would be generated at full build out of the land use scenario was conducted for applicable funding tools.
- **Stakeholder / Partner Consultations:** *brief description – land / property owners, Avion*
- **Infrastructure Funding Plan:** This chapter outlines a general funding approach for each infrastructure type. It describes implications of the plan and summarizes funding responsibilities.

Funding Plan

- *Note to reviewer: We envision the following potential discussions in this sub-section:*
  - *Introductory text – overall strategy of the SE Area Funding Plan*
  - *Brief description of chapter organization (subsections by infrastructure types)*
  - *Description about phasing / sub-geographies, if applicable*
  - *Overview of service providers; responsibilities*
    - Transportation providers: Oregon Department of Transportation (ODOT), Deschutes County, City of Bend
    - Wastewater Collection and Treatment (Sewer) provider: City of Bend
    - Domestic Water provider: Avion Water Company

Transportation

Transportation infrastructure in the SE Expansion Area will largely be the responsibility of either private developers or the City to build and the City's responsibility to maintain. The following is a summary of the types of transportation improvements needing funding, and examples of how they may be funded.

- **On-site and frontage streets, bikeways and trails**. These transportation facilities are typically paid for by developers during the development entitlement process. This category of transportation infrastructure includes local and collector road facilities.

- **Projects in City plans**. There are select transportation projects that the City is planning to fund and construct. These facilities are listed in the either the City's Capital Improvements Plan or Transportation System Plan. For example, current improvements to Murphy Road are being funded and constructed by the City. For the SE Expansion Area, the current TSP update lists a few projects that fall into this category. For a full list of transportation projects, see Appendix A.

- **Off-site improvements on the City system**. Development in the SE Expansion Area will trigger "off-site" improvements on transportation facilities outside of the expansion area. These transportation infrastructure enhancements are triggered when new development creates trips originating or ending in the expansion area that cause these off-site facilities to exceed adopted standards for level of service. The funding of off-site improvements is addressed on a case-by-case basis during development review.

- **Off-site improvements on the ODOT system**. Like all expansion areas in Bend, the SE Expansion Area must show how the Oregon's Transportation Planning Rule (TPR, OAR 660-012) has been met. For the recently annexed Westside Area, a per-trip fee was calculated and adopted by agreement as the tool for coordinating a proportional contribution to the state system and complying with the TPR. For the Discovery West development project in the Westside Area, a $229 fee per trip was apportioned by development phase and tied to the project's estimated proportionate share of growth trips that would affect ODOT facilities. A similar approach will be used for allocating TPR fees in the SE Expansion Area. The City of Bend is currently in discussions with ODOT about TPR compliance. The TPR fee for the SE Expansion Area has yet to be established.

Transportation Infrastructure Projects

The City of Bend is developing its 20-year transportation system plan—the Bend Transportation Plan (commonly referred to as the "TSP"). Several transportation projects, within that plan, are located in the SE Expansion Area. Many of the transportation projects listed in the TSP, were prioritized for funding in the near-term (year 1 through 10), mid-term (syear 11 through 15), and long-term (year 16 to 20)[1]. The City's share of costs that fall into these priority categories are assumed to be funded and delivered by the City of Bend over the 2020–2040 planning period.

Transportation projects not prioritized are assumed to be funded by development either *directly* through developer contributions or *indirectly* through tools such as local improvement districts, supplemental transportation system development charges, and/or negotiated agreements. It is anticipated that the majority of transportation infrastructure projects in the SE Expansion Area will be funded in this way. To clarify how projects are anticipated to be funded, Table 1

[1] The TSP planning period is from 2020 to 2040. Year 1 starts in FY 2020-2021.

aggregates projects costs, and funding responsibility assumptions, into categories. Appendix A provides a project by project description of costs and funding responsibilities.

- *Note to Reviewer: project costs and funding responsibilities are subject to changes*

Table 1. Transportation Infrastructure Projects and Cost Estimates (2018 dollars)

Infrastructure by Categories of Projects	Aggregated, Estimated Project Costs	Share of Costs Paid by City	Share of Costs Paid by Developer
Rural Road Upgrades to 27th/Knott	$2.5 million	%	%
New Collector Roads	$21.3 million	%	%
Key Routes	$XX	%	%
Intersection Projects	$XX	%	%
TOTAL Costs	**$XX**	**%**	**%**

Source: City of Bend, Bend Transportation Plan, 2020-2040. Estimates by Kittelson & Associates.

Table 2. Transportation Off-Site Projects and Cost Estimates (2018 dollars)

Off-Site Projects	Estimated Project Costs	Share of Costs Paid by City	Share of Costs Paid by Developer
Project A	$	%	%
Project B	$	%	%
Project C	$	%	%
TOTAL Costs	**$**	**%**	**%**

Source: City of Bend, Bend Transportation Plan, 2020-2040. Estimates by Kittelson & Associates.

Transportation Funding Options

The TSP identifies several new (or expanded existing) capital funding tools to cover the City's share of prioritized transportation project costs over the planning horizon. Those costs, estimated at $$$ (see Table 1) will be funded by the funding tools identified in the TSP and confirmed through their tool-specific funding process (e.g. by voters, by a City Council vote, etc.)

- **General Obligation (GO) Bond.** GO Bonds are debt issued for capital projects and infrastructure improvements. GO bonds are issued by the City and—in Bend—require a public vote.
- **City-wide Transportation System Development Charge (TSDC) rate increase.** TSDCs are charges on new development, and some redevelopment, which occurs within the City. The City's TSDC rate, as of January 1, 2020, is $8,000 per equivalent dwelling unit (EDU).
- **Vehicle Registration Fee (VRF).** VRFs are recurring charges to businesses and individuals that own cars, trucks, and other vehicles. While this tool is on the table for funding transportation projects, it is currently being described as a tool suitable for projects that are *regional in scope*, and therefore may not be a direct funding source for projects in the SE Expansion Area.

- **Seasonal Fuel Tax and/or Seasonal Food and Beverage Sales Tax.** The seasonal fuel tax is a tax on the sale of fuel with levy rates that fluctuate based on the month. A seasonal tax on the sale of prepared food and beverages is a tax added to the price at the point of sale, with a levy rate that would fluctuate based on the time of the year.

Other potential new tools were identified in the TSP as potentially suitable for SE Expansion Area projects. These tools include:

- **Supplemental TSDC.** Supplemental TSDCs are additional one-time fees that are typically paid at the time of building permit issuance. These fees are layered on top of the City-wide TSDCs. These fees are paid by new development within a defined geographic area and are therefore potentially applicable for the SE Expansion Area. Supplemental TSDC funds may be used for TSDC-eligible capital projects that increase capacity and benefit/serve the defined area. A supplemental TSDC can be implemented without a public vote.
- **Local Improvement Districts (LIDs).** LIDs are a type of special assessment district where several adjacent property owners are assessed a fee to pay for capital improvements within the LID boundary. Local street infrastructure improvements that benefit specific properties in a defined area may be funded by LID assessments. LIDs may be appropriate for use in the SE Expansion Area to finance infrastructure that is needed to develop properties within the specific LID boundary. The City already has regulations that allow LIDs. However, to date LIDs have not been widely used for transportation infrastructure in the Bend area.

Transportation Related Revenue Projections

Table 3 shows revenue potential from the City's city-wide TSDC. [*Revenue summary to be added here in final draft]*

However, it should be noted that *all city-wide TSDC revenues including revenue produced from SE Expansion Area development is assumed to be committed to paying debt obligations on transportation projects that have already been built or to projects in the City's existing CIP. This pre-allocation of revenue is anticipated through the mid-term. In years 2031 through 2040, it is also likely that TSDC revenue will be pre-committed to on-going debt payments.*

Non-committed TSDC revenue at the City's existing rate and/or additional TSDC revenue generated through a rate increase is assumed to go toward prioritized transportation projects in the near-, mid-, and long-term. Some of the transportation projects in the SE Expansion Area are currently eligible to receive these funds (see Appendix A).

- *Note to reviewer: The consultant team is working with the City to vet revenue projection assumptions. Revenue projections are subject to change.*

Table 3. Estimated Revenue Potential (2018 dollars) from the City-wide Transportation System Development Charge, Southeast Expansion Area (at full build-out)

Development Type	Est. Revenue at Existing Rate
Residential	$XX
Commercial	$XX
TOTAL Revenue	**$XX**

Source: Calculations by ECONorthwest, using the City of Bend's Fiscal Year 2019-2020 Fees Resolution and development assumptions from Envision.

Note: Values are in 2018 dollars and rounded to the nearest $1,000.

- *Note to Reviewer: If desired, projections for LIDs and supplemental TSDC can be developed.*

Transportation Funding Strategies and Recommendations

- *Summary to be added in final draft.*

Sewer

The City of Bend is responsible for maintaining the City's sanitary sewer infrastructure. For the SE Expansion Area, sewer infrastructure will largely be the responsibility of private developers to build. However, the City recognizes that some sewer infrastructure projects needed for development to occur in the SE Expansion Area would be costly and difficult for developers take on alone. Two sewer projects in particular fall into this category. These are (1) a large pump station, and (2) force main line that connect the pump station to the City's gravity system. The City is currently considering how to best proceed with funding and construction of these two sewer projects; there is currently no agreed upon assumption that dictate cost-sharing for each of these projects.

Regarding sewer funding, the City collects a system development charge on new development and levies a sewer utility fee. These funding tools are used to pay for the City's share of infrastructure costs. Private developers will be responsible for paying sewer SDCs and southeast area households and commercial businesses will be responsible for paying the sewer utility fee once sewer service is available and connected.

Sewer Infrastructure Projects

- *Description of projects*
- *Summary of costs – Provided by Murraysmith and Jacobs*
  - "Cost estimates are intended to be used as guidance in establishing funding requirements at the project planning level based on information available at the time of the estimate. Estimates exclude land acquisition, financing, and inflation. Cost estimates were performed in 2019 dollars."

Table 4. Sewer Infrastructure Projects and (Class 5) Cost Estimates (2019 dollars)

Infrastructure	Estimated Project Costs (Low)	Estimated Project Costs (High)	Share of Costs Paid by City	Share of Costs Paid by Developer
1 – gravity	$1.2 million	$1.8 million	%	%
2 – gravity	$1.3 million	$1.9 million	%	%
3 – gravity	$1.3 million	$1.9 million	%	%
4 – gravity	$2.8 million	$4.1 million	%	%
5 – force main	$1.3 million	$1.8 million	%	%
6 – gravity	$1.8 million	$2.7 million	%	%
Pump Station	$3.5 million	$5.1 million	%	%
TOTAL Costs	**$13.2 million**	**$19.3 million**	**%**	**%**

Source: Jacobs and Murraysmith.

Sewer Funding Options

With the exception of the large pump station and force main, the City anticipates that developers will extend pipes to their properties as development occurs over time. The City's funding mechanism options to pay for the new pump station are limited. The City's existing tools, outlined below, may be used to fund sewer infrastructure projects are:

- **Sewer System Development Charge (SSDC).** SSDCs are charges on new development, and some redevelopment, which occurs within the City. Revenues are used to fund growth-related capital improvements that are on the City's adopted SSDC project list, as prioritized by Council. The City's SSDC is based on equivalent dwelling units (EDU). In 2019 the SSDC rate was $4,891 per single-family dwelling, duplex (per unit), and townhome (per unit). The rate for multifamily housing and mobile homes in parks is $3,913 (per unit). Motels, board, and rooming houses is $1,956 (per room). Currently, there are no SE Expansion Area sewer projects on the Sewer SDC eligible list. Projects may [The City will consider adding SE Expansion Area projects to the eligible list]

- **Sewer Utility Fee.** A sewer utility fee is typically assessed to all businesses and households in a jurisdiction or geographic area. The City already imposes a monthly sewer utility fee and they could consider increasing the city-wide utility rate. Currently, the utility rate for a single-family dwelling unit is $36.42 per month, plus $3.82 per 100 cubic feet of average winter quarter water usage (WQA). Multifamily dwelling units are charged a base rate of $14.39, plus $3.82 per 100 cubic feet of WQA. Non-residential customers are charged a base rate of $36.42 per month, plus $3.82 per 100 cubic feet of WQA.

In addition to these currently established funding tools, the City could rely on other new tools to fund sewer projects. These are:

- **Local Improvement District (LID).** As stated in the transportation section, an LID is a type of special assessment district where adjacent property owners are assessed a fee to pay for capital improvements that are necessary to serve new development within the LID boundary. Projects that benefit multiple property owners in the SE Expansion Area may be funded by LID assessments. LIDs allow for cost-sharing among property owners that face the need the same costly infrastructure to develop their properties; it removes the burden of these costly projects from one developer alone. The City has had several previously successful sewer LID projects, for projects that ranged from approximately $88,000 to $4.4 million.

Sewer Related Revenue Projections

Table 5 show revenue potential of the City's city-wide system development charge, based on full build-out of development in the SE Expansion Area.

Table 5. Estimated Revenue Potential (2018 dollars) from the City-wide Sewer System Development Charge, Southeast Expansion Area (at full build-out)

Development Type	Est. Revenue at Existing Rate
Residential	$XX
Commercial	$XX
TOTAL Revenue	$XX

Source: Calculations by ECONorthwest, using the City of Bend's Fiscal Year 2019-2020 Fees Resolution and development assumptions from Envision.

Note: Values are in 2018 dollars and rounded to the nearest $1,000.

Table 6 shows revenue potential of the City's sewer utility fee (existing rate and potential rate increases) based on full build-out of development in the SE Expansion Area.

Table 6. Estimated Revenue Potential from City-wide Sewer Utility Fee, Existing Rate, (2019 dollars)

Development Type	Count of Development Type at Full Build-Out	WQA Assumption	Existing Monthly Rate	Volume Charge per cu. Ft.	Est. Revenue at Existing Monthly Rate
TOTAL Revenue					

Source: Calculations by ECONorthwest.

- *Note to Reviewer: If desired, projections for an LID can be developed.*

Sewer Strategies and Recommendations

- *Summary*

Water

The water system which serves the SE Expansion Area is owned by the Avion Water Company. [A small portion of the Ward's property is within the City of Bend service area]. Avion Water is a private utility that is regulated as a rate and service regulated private water utility under the Oregon Public Utility Commission. Avion is a locally owned, private utility that sources its water from one of the United States' largest aquifers. Because Avion is a private utility, they are not required to go through a capital improvement planning process to develop Capital Improvement Programs. They impose rates on their customers to cover the cost of their services. Water system infrastructure for the SE Expansion Area will be the sole responsibility of private developers, unless Avion participates in cost-sharing agreements.

Water Infrastructure Projects

- *Description of projects + Summary of costs: Data provided by Avion (Damian and City engineers will work with Avion to get a layout of the pipes with cost estimates)*

Table 7. Water Infrastructure Cost Estimates

Project	Est. Total Project Cost	Share of Costs Paid by City	Share of Costs Paid by Avion	Share of Costs Paid by Developer
Project A	$$	%	%	%
Project B	$$	%	%	%
TOTAL	**$$**	**$$**	**$$**	**$$**

Source: City of Bend and Avion.

Water Funding Options

- Table 8 implies that the financial responsibility for constructing water infrastructure projects in the SE Expansion Area will predominately be on the developers.

Water Strategies and Recommendations

- *Summary*

Funding Plan Conclusions

- *Conclusions: Key considerations of the Funding Plan / high-level recommendations*
- *Next steps: Outlines observations / issues to be addressed as next steps in the decision-making process*
- *What does this mean for phasing development? What does this mean for estimated development costs per acre?*
- *Will include a matrix that summarizes funding responsibilities*

Table 8. Summary of Infrastructure Project Funding Responsibilities

Project	Est. Total Project Cost	Share of Costs Paid by City	Share of Costs Paid by Developer	Share of Costs Paid by Other Party
Transportation				
Rural Road Upgrades to 27th/Knott	$$	X		
New Collector Roads	$$		X	
Key Routes	$$	X		
Intersection Projects	$$	X	X	
Sewer				
Pump Station	$$	X	X	
Force Main Line	$$	X	X	
Other Sewer Projects?	$$		X	
Water				
Project A	$$			X
Project B	$$			X

Table 9. Estimated Development Costs per Acre

Appendix A. Infrastructure Project Details

This section provides detailed information about infrastructure projects in Bend's Southeast Expansion Area.

- Note: Project costs and funding responsibilities subject to change

Transportation Projects

Table 10. Transportation Infrastructure Projects and Cost Estimates (2018 dollars)

Ref	Project	Est. Project Cost	Share of Costs Paid by City	Share of Costs Paid by Developer	TSDC Eligible?	TSP Phasing[2]
	Rural Road Upgrades to 27th/Knott					
R15	SE 27th Street rural Road upgrade from Ferguson Road to Diamondback Lane (Includes curb and sidewalk on east side, bike lanes for both directions on 27th Street)	$600,000	100%	0%	No	Long-term
R16	SE 27th Street rural Road upgrade from Diamondback Lane to access road (Includes curb and sidewalk on east side of 27th Street)	$100,000	100%	0%	No	Long-term
R17	SE 27th Street rural Road upgrade from access road to Knott Road (Includes curbs and sidewalks on both sides of 27th Street)	$1,300,000	100%	0%	No	Long-term
R18	Knott Road rural Road upgrade from 15th Street to Raintree Court (Includes curbs, sidewalks and bike lanes for both directions on Knott Road)	$500,000	100%	0%	No	Long-term

[2] From the draft Transportation System Plan project priorities list as of November 2019 – draft and subject to change.

Ref	Project	Est. Project Cost	Share of Costs Paid by City	Share of Costs Paid by Developer	TSDC Eligible?	TSP Phasing[2]
	New Collector Roads					
224	Construction of two-lane collector	$10,200,000	0%	100%	No	As Development Occurs
213	Construction of two-lane collector	$4,000,000	0%	100%	No	As Development Occurs
226	Construction of two-lane collector	$7,100,000	0%	100%	No	As Development Occurs
	Key Routes					
8	Shared use path adjacent to road: Close sidewalk gap along 27th Street and create a low-stress bikeway.	$4,815,000	100%	0%	No	Near-term
11	Shared use path adjacent to roadway: Close sidewalk gaps and create a low-stress bikeway.	A Portion of this projects is funded (2020-2024 CIP)	XX%	XX%	No	Near-term
	Intersection Projects					
N-16	Reed Market Road/15th Street intersection safety and capacity improvements (Includes expanding the partial multi-lane roundabout to a full multi-lane roundabout)	$1,100,000	100%	0%	No	Near-term
X-1	Country Club Road/Murphy Road Intersection Improvement	$3,700,000	100%	0%	**Yes**	Mid-term
X-2	Country Club Road/Knott Road Intersection Improvement	$3,700,000	100%	0%	**Yes**	Mid-term
X-6	Ferguson Road/15th Street Intersection Improvement	$3,700,000	100%	0%	No	Mid-term

Ref	Project	Est. Project Cost	Share of Costs Paid by City	Share of Costs Paid by Developer	TSDC Eligible?	TSP Phasing[2]
X-14	Brosterhous Road/Knott Road Intersection Improvement	$3,700,000	100%	0%	**Yes**	Mid-term
X-5	China Hat Road/Knott Road Intersection Improvement	$3,700,000	100%	0%	**Yes**	Long-term
N-30	US 20/27th Street Intersection Improvement	$2,100,000	10%	90%	No	Long-term
A-3	Ponderosa Street / China Hat Road overcrossing	$15,000,000	100%	0%	No	Long-term
25	27th Street Arterial Corridor upgrade from Bear Creek Road to Ferguson Road	$8,600,000	100%	0%	**Yes**	Long-term
	Total	**$$$**	**$$$**	**$$$**		

Source: City of Bend, Bend Transportation Plan, 2020-2040. Estimates by Kittelson & Associates.

Agenda Item No. 1:
Southeast Area Plan Code Concepts Memorandum

CITY OF BEND
SOUTHEAST AREA PLAN

Southeast Area Plan Code Concepts

PREPARED FOR: Southeast Area Plan Advisory Committee (SEAPAC)

COPY TO: File

PREPARED BY: Project Team

DATE: November 18, 2019

Overview

This memo is intended to support discussion by SEAPAC regarding development code concepts to implement the Southeast Area Plan. This memo outlines some of the regulatory tools proposed to capture ideas discussed during the planning process and implement the vision for the Southeast Expansion Area. As used here, code "concepts" are the basic ideas for tailored zoning regulations for the plan. Following SEAPAC discussion, the project team will convert the concepts into detailed code amendments for review.

Special Planned Districts

Special Planned Districts are used by the City of Bend to provide more detail about the type of development intended for a specific area than is typically identified by the City's zoning code or Comprehensive Plan. Once adopted, Special Planned Districts create standards for the development of land within the plan boundaries that may supersede those of the underlying zone. Regulatory tools that can be adopted as part of a Special Planned District include:

- Overlay land use districts
- Permitted land uses
- Design standards
- Landscape standards
- Development standards
- Special street standards
- Access and circulation standards
- Parking requirements
- Transportation mitigation plan

The following table provides some examples of existing Special Planned Districts in the City and the tools and standards they use to regulate development.

Table 1. Examples of Special Planned Districts in Bend

DISTRICT	REGULATORY TOOLS USED
NORTHWEST CROSSING	• Overlay Districts • Development Standards • Special Street Standards
CENTRAL OREGON COMMUNITY COLLEGE	• Permitted Uses • Development Standards • Parking Requirements • Access and Circulation • Special Street St
JUNIPER RIDGE	• Overlay Districts • Permitted Uses • Development Standards • Transportation Mitigation Plan
MURPHY CROSSING	• Overlay Districts • Permitted Uses • Development Standards • Special Street Standards
15TH STREET SCHOOL OVERLAY	• Permitted Uses • Development Standards • Design Standards • Access and Circulation • Landscape Standards • Parking Requirements • Special Street Standards • Transportation Mitigation Plan

Recommended Concepts for the Southeast Area Plan

The Project Team recommends developing a Special Planned District for the Southeast Expansion Area that would include the following concepts:

1. Land use districts with the permitted and conditional uses tailored to implement the Southeast Area Plan;
2. Design standards to ensure quality design and compatibility with surrounding neighborhoods;
3. Requiring buffers and transition areas where non-residential uses are located adjacent to residential neighborhoods;
4. Outdoor lighting regulations that prevent light pollution due to new development; and
5. Landscape standards that encourage the integration of natural features such as significant rock outcrops and large trees into site design.

As with all of Bend's Special Planned Districts, the Southeast Area Special Planned District would incorporate new ideas, like those listed above, with existing uses and code standards that are appropriate to retain and apply.

The following table is the first step in defining the modifications to uses for land use districts in the Southeast Expansion Area. The four remaining code concepts are addressed in the attached code concept sheets.

Table 2. Permitted Uses in the Southeast Area Plan

LAND USE DISTRICT	USE MODIFICATIONS
RESIDENTIAL (RS, RM, RH)	All uses allowed under Table 2.1.200, except the following: 1. Repair services conducted entirely within a building; including vehicle repair, small engine repair, and similar uses. Those uses not permitted in the RS, RM, and RH Zones are not allowed in the Southeast Expansion Area.
GENERAL COMMERCIAL (CG)	All uses allowed under Table 2.2.300, including the following additions: 1. Multifamily housing constructed with commercial development. Those uses not permitted in the CG Zone are not allowed in the Southeast Expansion Area.
MIXED EMPLOYMENT (ME)	All uses allowed under Table 2.3.200, including the following additions: 1. Residential uses included with new mixed-use development. 2. Residential uses included with new development proposed through a master plan proposed under BDC Chapter 4.5, Master Planning and Development Alternatives. Housing allowed under BDC Table 2.3.200 must satisfy BDC 4.5.200(E)(3). 3. Veterinary Clinics, for both small and large animals.
LIGHT INDUSTRIAL (IL)	All uses allowed under Table 2.4.300, except the following: 1. Heavy Manufacturing, assembly, and processing of raw materials and recycling 2. Junk yards, automobile wrecking yards, and similar uses 3. Marijuana related uses 4. Marijuana grow sites and marijuana producing 5. Marijuana wholesale 6. Marijuana processing of cannabinoid concentrates and cannabinoid products 7. Processing of cannabinoid extracts And adding a new use: 1. Flex Space Proposed definition of Flex Space (from 2019 Market and Land Use Analysis): Flex Space refers to buildings that offer flexible spaces that can accommodate a range of office, warehouse, or another type of commercial use such as research and development, medical, industrial, and quasi-retail.

LIGHT INDUSTRIAL CONCEPTS

What standards exist in the code today?

PERMITTED USES

Examples of uses permitted in Light Industrial zones include:

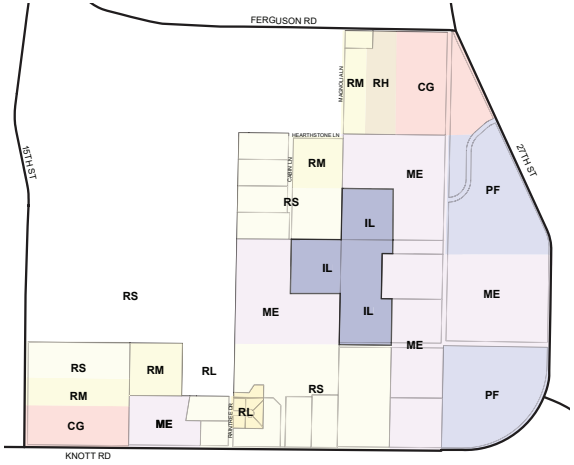
- Light manufacturing, fabrication, and repair of goods
- Research and development facilities
- Production office
- Food and beverage processing and packaging
- Medical and dental laboratories and veterinary clinics
- Mini-storage warehouse
- Commercial parking lot

SITE AND BUILDING DESIGN

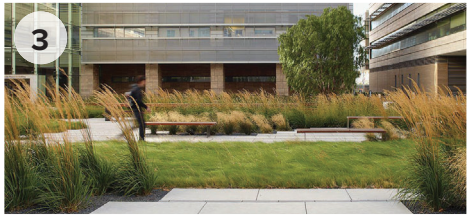
- **Setbacks.** Buidings are required to be set back a minimum of 10 feet from the street. No structure can be constructed within 20 feet of an adjacent residential zone.
- **Orientation.** Buildings must be oriented to minimize adverse impacts such as noise, glare, dust, etc. Industrial elements that are outside buildings must be located away from residential areas, schools, and parks.
- **Buffers.** A minimum 20-foot-wide buffer is required between Light Industrial development and all adjacent residential zones. Buffers must provide landscaping to screen industrial activities from residential uses.
- **Building Facade.** Street-facing facades longer than 75 feet must include a variety of architectural features such as windows, doors, offsets, projections, detailing, or changes in materials to provide visual interest.
- **Landscaping.** A minimum of 15% of each industrial site must be landscaped, with at least 75% of that area visible to the public. Landscape materials can include trees, shrubs, plants, and outdoor hardscape features such as patios, decks, plazas, or paved dining areas.

Draft new concepts for the Southeast Expansion Area

- **Prohibited Uses.** Prohibit heavy manufacturing, junk yards, and marijuana-related uses in Light Industrial districts in the Southeast Expansion Area.



- **New Uses.** Add Flex Space as a new permitted use in Light Industrial zones. Flex Space accomodates a range of office, warehouse, or commercial uses such as research and development, medical, industrial, and quasi-retail.
- **New Design Standards.**
  - Require a 20-foot-wide landscape buffer along all sidewalks and trails (photos 5 and 6).
  - Locate most parking behind buildings to improve the aesthetics and pedestrian friendliness of the streetscape (photos 1 and 4).
  - Include a list of preferred facade treatments, such as stone, brick, or wood (photos 1 and 2).



BUFFERS & TRANSITION AREAS

What standards exist in the code today?

LANDSCAPE BUFFERS

A landscape buffer is required between residential zones and the following non-residential zoning districts. The landscape buffer should include trees, shrubs, and ground cover and must provide both a visual and auditory buffer from adjacent non-residential uses.

- Commercial Zones (CB, CC, CL, CG) – 5 foot minimum width
- Mixed Use Zones (ME, MR, PO, MU, MN) – 10 foot minimum width
- Industrial Zones (IG, IL) – 20 foot minimum width

Landscape buffers are also required to separate large parking or maneuvering areas from adjacent streets or buildings, and to screen any type of mechanical equipment, outdoor storage, manufacturing, or service and delivery areas.

Landscape materials can include:

- Live trees, shrubs, and ground cover plants
- Hardscape features such as patios, decks, plazas, or paved dining areas
- Non-plant ground covers such as bark dust or chips
- Stormwater facilities such as landscaped bio-swales

BUILDING SETBACKS

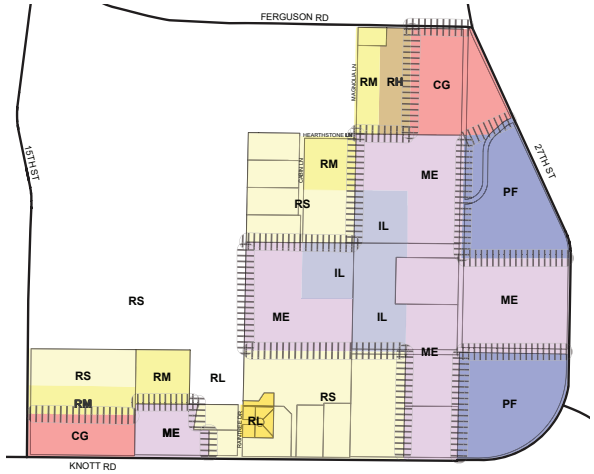
Building setbacks improve fire protection, sunlight and air circulation, noise buffering, and visual separation between buildings. Nonresidential buildings that are adjacent to a residential zone must be set back a minimum of 10 feet in commercial and mixed use zones, or 20 feet in industrial zones.

Landscaping and natural features provide a buffer for this office building

Landscaping and street trees provide a transition between a cafe and neighboring homes

Draft new concepts for the Southeast Expansion Area

The following map shows potential transition areas where the code could require the use of additional treatments to promote compatibility between land uses.



The plan could include a "toolbox" of preferred treatments, such as those shown in the photos below. One or more of these treatments would be required to buffer the transition between different land uses. Streets, such as Magnolia Lane, Hearthstone Lane, and the two new proposed collector roads, can also be used to provide separation between adjacent land uses.

Street

Multi-Use Path

Landscaping

Additional Setback

Natural Feature

Green Alley

INTEGRATING NATURAL FEATURES IN DEVELOPMENT

What standards exist in the code today?

LANDSCAPE CONSERVATION AND DEVELOPMENT REVIEW

Bend's landscape conservation standards are intended to incorporate significant native trees and vegetation into the landscapes of new developments. The preservation of existing natural features including trees, vegetation, and special terrain features as a condition of approval for new subdivisions, paritions, and conditional use permits. Development sites containing significant trees (defined by measuring tree diameter at breast height) are sometimes required to submit a Tree Protection Plan with their development application.

Significant vegetation identified during the site design process is generally required to be retained unless it prevents the development of public streets, utilities, needed housing, or other permitted land uses. If a proposed development is able to show that it will preserve stands of trees or significant individual trees the City may allow reductions in setbacks, parking, or landscaping requirements, density transfers, increased lot coverage, or increased lot sizes for subdivisions or partitions.

UPLAND AREAS OF SPECIAL INTEREST OVERLAY ZONE

Areas of Special Interest (ASIs) are areas designated by the City where the natural landscape will be preserved as growth occurs. Significant features can include rock outcrops, stands of trees, ridges, and faults. These areas typically contain high points or changes in elevation that break the line of sight so that the area retains a feeling of undeveloped open space. Areas within an ASI overlay are subject to special development standards that are intended to restrict new development to protect vegetation and other natural features.

Any individual or organization can apply to have an area containing significant natural features designated as a new ASI. New designations are determined by the City based on a scoring system methodology.

Draft new concepts for the Southeast Expansion Area

The Southeast Expansion Area is home to a unique and complex landscape with numerous signature trees and tree groves, areas of dense native vegetation, rock outcrops, and ridges.

If desired, the Southeast Area Plan process could develop a modified landscape conservation standard requiring all new development to map significant natural features and preserve a certain percentage of the total significant area in the final development plan.

Additionally, property owners are ***allowed***, but ***not required***, to apply to designate portions of their property containing sigificant natural features as ASIs. Significant natural features can include:

Areas designated as ASIs could serve the following purposes in the Southeast Expansion Area:

- Provide a visual and physical buffer between adjacent land uses
- Retain a feeling of undeveloped open space in the area
- Preserve habitat for native plant and animal species
- Conserve the "natural character" of Bend

OUTDOOR LIGHTING

What standards exist in the code today?

Outdoor lighting is used to illuminate residential neighborhoods, commercial and industrial areas, public spaces, and roadways and walkways. This includes lighting for buildings, recreation facilities, parking lots, landscaping, streets, holiday celebrations, and construction sites.

All outdoor lighting fixtures are required to either be full cut-off fixtures (fixtures that project all light in a downward direction) or to have a shielding method that directs light downward. Outdoor lights are not permitted to shine directly or cast a glare onto adjacent properties.

Examples of full cut-off lighting

Businesses and institutions with outdoor lighting are encouraged to extinguish their lights at the end of the working day, and outdoor lighting used for sporting events or other outdoor performances must be extinguished within one hour after conclusion of the final event of the day.

Some types of low-wattage or temporary outdoor lighting are exempt from these standards, including:

- Decorative residential lighting
- Commercial or industrial lighting used to highlight driveways or landscaping
- Lighting for correctional institutions
- Temporary holiday decorations
- Temporary lighting for carnivals, fairs, or movie productions
- Top-mounted lighting for U.S. flags
- Roadway, utility, or building construction that does not exceed 60 days in any one location
- Lighting used to highlight art features within a traffic circle or roundabout
- Sports and recreation facilities, provided that the lights are extinguised within an hour after the final event of the day

Draft new concepts for the Southeast Expansion Area

Existing City standards regarding outdoor lighting provide a strong foundation for preventing unnecessary light pollution. Additional standards for the Southeast Area Plan will be determined through discussions with SEAPAC.

Additionally, the project team will review the Model Lighting Ordninance produced by the International Dark-Sky Association for ideas relevant to the Southeast Expansion Area, and may consider adopting additional standards that would apply in addition to or supersede existing standards in Section 3.5.200 of the Bend Development Code.