BEFORE THE PLANNING COMMISSION
OF THE CITY OF BEND

A 2018 COLLECTION SYSTEM PUBLIC FACILITY	(
PLAN AND AMENDMENTS TO THE TEXT OF	(
CHAPTERS 2, 3, AND 8 OF THE BEND	(
COMPREHENSIVE PLAN	(
PROJECT NO. S17PFP	(
RECOMMENDATION TO THE CITY COUNCIL	(

NATURE OF THE APPLICATION

Type IV Legislative amendments to the Bend Comprehensive Plan. This proposal includes adoption of a 2018 Collection System Public Facility Plan (CSPFP) to replace the 2014 CSPFP as Appendix I of the Bend Comprehensive Plan, and amendments to the text of Chapters 2, 3, and 8 of the Bend Comprehensive Plan. The application was processed in accordance with BDC 4.1.500.

1. Timely and sufficient notice of the public hearing was provided pursuant to BDC 4.1.515.
2. On July 9, 2018, the Planning Commission held a work session and reviewed the proposed amendments.
3. On July 23, 2018, the Planning Commission held a public hearing on Project Number 17SPFP, and began deliberation. The Planning Commission voted to recommend that the City Council approve the proposed 2018 CSPFP and the proposed comprehensive plan text amendments in Exhibit A.
4. The findings in support of this recommendation are contained in Exhibit B.
5. The Growth Management Department staff report and recommendation have been considered and are part of the record of this proceeding. Findings in support of the CSPFP and amendments to the text of the Comprehensive Plan are attached as Exhibits A and B to the Staff Report.

CONCLUSION

The 2018 Collection System Public Facility Plan and amendments to the text of Chapters 2, 3, and 8 of the Bend Comprehensive Plan meet the applicable Development Code criteria of approval found at BCD 4.6.200.

RECOMMENDATION

The Bend Planning Commission recommends that the City Council adopt an ordinance through which the Council adopts the 2018 CSPFP as Appendix I to the Bend Comprehensive Plan and the amendments to the text of Chapters 2, 3, and 8, in Exhibit A and the findings in Exhibits B.

This RECOMMENDATION was approved by the Bend Planning Commission on July 23, 2018.

Attest -
Ayes: 5
Nays: 0
Absent: 2
Abstain: ____
Vacant:

Planning Commissioner Chair

Exhibit A

Amendments recommended through the Bend Planning Commission's July 23, 2018 Order on 17SPFP

murraysmith

CITY OF BEND

Collection System Public Facility Plan

JUNE 2018

COLLECTION SYSTEM
PUBLIC FACILITY PLAN
(June 2018)

CITY OF BEND, OREGON

MURRAYSMITH, INC
888 SW 5th Avenue, Suite 1170
Portland, Oregon 97204

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CITY OF BEND GOAL 11 COLLECTION SYSTEM PUBLIC FACILITY PLAN (Update June 2018)

Introduction and Summary

This 2018 public facility plan (PFP) has been created in compliance with the requirements of Goal 11, Public Facilities Planning, and the implementing rule for the planned land uses under the Bend Comprehensive Plan (2016). The previous PFP was published and adopted in 2014 with the City of Bend's (City) Collection System Master Plan (CSMP, 2014). Subsequently, the City performed an Urban Growth Boundary Expansion Study (UGB Study, 2016) adopting an expanded UGB in 2016. The expanded UGB includes redevelopment areas within the City limits and 2,380 acres of expansion lands. This 2018 PFP replaces the 2014 PFP. This 2018 PFP documents capital improvement projects to support growth in the new UGB including the expansion lands.

The purpose of the plan is to help assure that development within the UGB is guided and supported by the types and levels of urban facilities and services appropriate for the needs and requirements of the areas to be served, and that those facilities and services are provided in a timely, orderly and efficient arrangement, as required by Goal 11 and its implementing administrative rule at Oregon Administrative Rule (OAR) 660-011.

PFP Goal 11 Compliance Components

This PFP includes the following Goal 11 compliance components:

a) An inventory and general assessment of the condition of all the significant public facility systems which support the land uses designated in the Bend Comprehensive Plan (2016);

b) A list of the significant public facility projects which are to support the land uses designated in the acknowledged comprehensive plan;

c) Rough cost estimates of each public facility project;

d) Written description of each public facility projects;

e) Policy statement(s) or urban growth management agreement identifying the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated;

f) An estimate of when each facility project will be needed; and

g) A discussion of the City's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each public facility project or system.

Relationship of the Collection System 2018 PFP with previous Collection System Planning Documents

In 2014, the City Council adopted the CSMP for the Bend UGB (See Ordinance 2231). One of the appendices to this CSMP was a Collection System PFP that was developed to satisfy the goal and administrative rule requirements for Statewide Planning Goal 11, Public Facilities and Services. The 2014 PFP was Appendix C to the CSMP.

This 2018 PFP replaces the 2014 PFP and represents the primary sewer collection planning document upon which the City will rely for capital improvement programming and when working with land use applicants on potential projects that require a sewer collection improvement. This 2018 PFP includes an updated Table 23 that is the Capital Improvement Program (CIP) developed for this PFP. This table includes projects originally identified in the 2014 CSMP and reflected in the 2014 PFP. New projects have been added to Table 23 to reflect new locations and sizes of key interceptors (e.g. North Interceptor Phases 1 through 3), and to provide sewer collection service to areas recently added to the Bend UGB in 2016.

The City will look to the projects in this 2018 PFP, first to inform capital improvement programming, and when working with developers to determine if a project has been identified that can provide sewer service to their proposed development. Where the tables in this 2018 PFP Update do not include data related to a project, the City will then look to the projects identified in the 2014 CSMP for project reference information and specifications, which is incorporated by reference into this PFP for this purpose. It is located at the City website at the following address.
https://www.bendoregon.gov/government/departments/engineering/master-plans-and-analyses/collection-system-master-plan

OAR 660-011-0010(1)(a) – Inventory and General Assessment

The City's primary wastewater collection system is generally comprised of access structures, gravity pipelines, lift stations and force mains that convey sewage to its water reclamation facility (WRF). In general, gravity and pressurized pipelines convey wastewater from the residential and commercial areas to the core of the system, where a large sewer interceptor ultimately transfers the sewage to the WRF. Due to the varied topography and lack of localized and regional gravity pipes in the City, 86 small, regional lift stations have been constructed to convey sewage to the WRF.

Existing System Condition Evaluation

The condition assessment evaluates the current physical state or performance of an asset and compares the current condition to a "like-new" condition. The evaluation is the result of City Operations &Maintenance (O&M) Department sewer access structure inspections, visual pipe inspections, closed-circuit television (CCTV) inspections and O&M personnel input. These condition assessments were developed over the course of several meetings during the development of the 2014 CSMP including workshops and staff interviews.

The components of the collection system subject to condition evaluation include the gravity piping and lift stations. Information related to replacement costs for force mains and pressure systems is included; however, the City has not inspected their condition. Historically, some developments were served by shallow gravity pipes and common pressure mains to expedite sewer service hook-ups. This has led to many small area and residential lift stations, which have increased O&M requirements. These lift stations often feed into a common pressure main with multiple pumping system tie-ins. The City no longer allows this type of sewer system installation and wants to replace the common pressure systems with either gravity systems, or pumping systems with dedicated force mains. The proposed interceptor projects will allow for the decommissioning of many lift stations with gravity service. A local-area improvement fund is also being proposed as part of the capital improvement plan that will, over time, provide sewer service to unsewered areas and improve poorly performing portions of the existing collection system.

Condition Rating of Plant Interceptor

The existing plant interceptor is comprised of a gravity pipeline and a double-barrel siphon near the WRF. The interceptor begins near the North Unit Canal crossing of Purcell Boulevard and discharges to the WRF. The gravity portion is 19,738 feet long and is comprised of 30-, 36-, and 42-inch reinforced concrete pipe. The double-barrel siphons are 21- and 36-inch diameter reinforced concrete pipe each approximately 4,882 feet long.

In 2013, the gravity portion of the plant interceptor and the siphon were inspected by an independent consultant. The gravity portion was evaluated using a combination of digital scanning, laser profiling, and sonar profiling. The siphon was inspected using sonar profiling. The access structures along the plant interceptor were inspected using a combination of digital scanning and man-entry inspection. In summary, approximately 31% of the gravity plant interceptor was rated grade-5, and approximately 37% contained grade-4 defects. The sonar profiling of the siphon did not detect any structural issues in the siphon pipes. However, there was a large accumulation of grease and debris detected in the siphon pipes. The majority of access structures were in good condition, with only ten exhibiting grade-4 or grade-5 defects (requiring near-term improvements).

Condition Rating of Gravity Pipelines

The City's collection system is comprised of gravity pipes between 4 and 48 inches in diameter and totaling approximately 380 miles. Based on information provided by the City's geographical information system (GIS), Tables 1 through 3 present a summary of the physical characteristics of the primary collection system's gravity piping. In order to understand phases and trends in the construction of the system, two attributes have been summarized together: Table 1 presents installation year and diameter, Table 2 installation year and material, and Table 3 material and diameter. Figures 1, 2, and 3 present diameter, installation year, and materials, respectively.

Table 1
Gravity Pipe – Installation Year and Diameter Summary

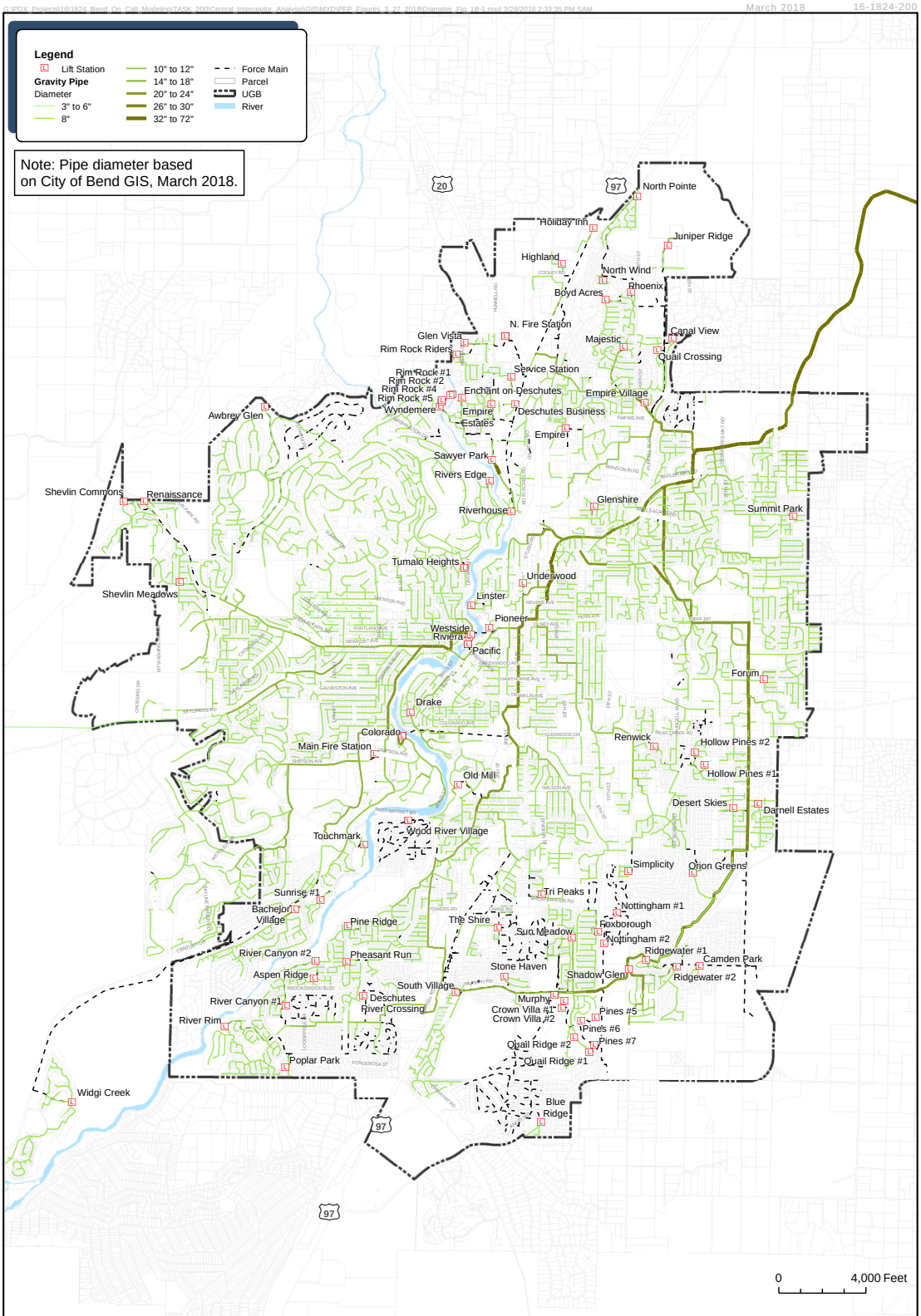
Diameter (inch)	Installation Year - Length (1,000 feet)							Percent
	Unknown	Pre 1970	1970-1979	1980-1989	1990-1999	2000-2009	2010-2017	
4	0	0	0	0	2	0	0	**0%**
6	0	0	46	3	6	6	9	**3%**
8	0.1	9	329	78	447	641	126	**81%**
10	0	2	22	13	21	9	10	**4%**
12	0	2	15	3	21	6	2	**2%**
15	0	0	16	1	9	7	5	**2%**
16	0	2	1	0	0	0	0	**0%**
18	0	0	3	0	16	1	6	**1%**
20	0	2	0	0	0	0	0	**0%**
21	0	0	6	7	5	2	0	**1%**
24	0	0	9	0	3	0	13	**1%**
27	0	1	10	1	0	0	1	**1%**
30	0	0	4	1	0	0	17	**1%**
36	0	0	3	17	0	1	0	**1%**
42	0	0	0	9	0	0	0	**0%**
48	0	0	0	0	0	0	0	**0%**
Percent	**0%**	**1%**	**23%**	**7%**	**26%**	**33%**	**9%**	**100%**

Table 2
Gravity Pipe – Installation Year and Material Summary

Material	Installation Year - Length (1,000 feet)							Percent
	Unknown	Pre 1970	1970-1979	1980-1989	1990-1999	2000-2009	2010-2017	
Asbestos Cement (AC)	0	0	2	0	0	0	0	**0%**
Cast Iron (CAS)	0	0	0	0	0	0	0	**0%**
Clay Tile (CT)	0	13	1	0	0	0	0	**1%**
Concrete Pipe (non-reinforced) (CP)	0	2	10	1	0	0	0	**1%**
Ductile Iron Pipe (DIP)	0	0	1	0	1	0	0	**0%**
High Density Polyethylene (HDPE)	0	0	0	0	0	0	8	**0%**
Vitrified Clay Pipe (VCD)	0	0	0	0	0	0	0	**0%**
Polyvinyl Chloride (PVC)	0	2	307	97	528	672	182	**89%**
Reinforced Concrete Pipe (RCP)	0	1	142	36	0	1	0	**9%**
Transite Pipe (TP)	0	0	1	0	0	0	0	**0%**
Other	0	0	0	0	0	0	0	**0%**
Percent	**0%**	**1%**	**23%**	**7%**	**26%**	**33%**	**9%**	**100%**

Table 3
Gravity Pipe – Material and Diameter Summary

Diameter (inch)	Material - Length (1,000 feet)											Percent
	Asbestos Cement (AC)	Cast Iron (CAS)	Clay Tile (CT)	Concrete Pipe (non-reinforced) (CP)	Ductile Iron Pipe (DIP)	High Density Polyethylene (HDPE)	Vitrified Clay Pipe (VCD)	Polyvinyl Chloride (PVC)	Reinforced Concrete Pipe (RCP)	Transite Pipe (TP)	Other	
4	0	0	0	0	0	0	0	2	0	0	0	**0%**
6	0	0	0	0	0	0	0	67	2	0	0	**3%**
8	1	0	6	12	1	6	0	1531	73	0	0	**81%**
10	1	0	2	0	1	0	0	64	10	0	0	**4%**
12	0	0	2	0	0	1	0	33	12	0	0	**2%**
15	0	0	0	0	0	0	0	25	14	0	0	**2%**
16	0	0	2	0	0	0	0	0	0	1	0	**0%**
18	0	0	0	0	0	0	0	23	3	0	0	**1%**
20	0	0	2	0	0	0	0	0	0	0	0	**0%**
21	0	0	0	0	0	0	0	9	11	0	0	**1%**
24	0	0	0	0	0	0	0	16	9	0	0	**1%**
27	0	0	0	0	0	1	0	0	12	0	0	**1%**
30	0	0	0	0	0	0	0	17	6	0	0	**1%**
36	0	0	0	0	0	0	0	1	19	0	0	**1%**
42	0	0	0	0	0	0	0	0	9	0	0	**0%**
48	0	0	0	0	0	0	0	0	0	0	0	**0%**
Percent	**0%**	**0%**	**1%**	**1%**	**0%**	**0%**	**0%**	**89%**	**9%**	**0%**	**0%**	**100%**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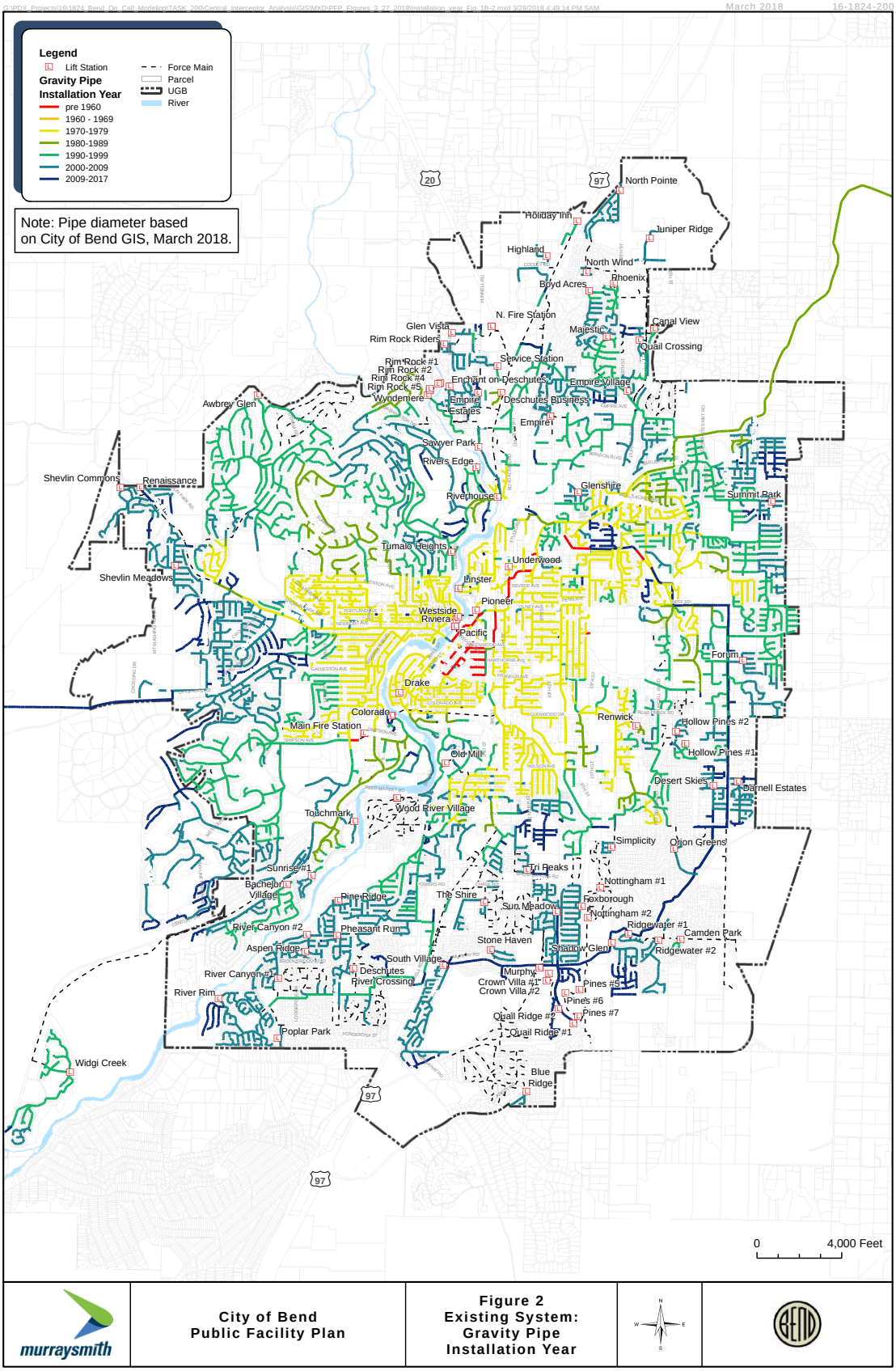
March 2018
16-1824-200
Legend
Lift Station
Gravity Pipe Diameter
3" to 6"
8"
10" to 12"
14" to 18"
20" to 24"
26" to 30"
32" to 72"
Force Main
Parcel
UGB
River
Note: Pipe diameter based on City of Bend GIS, March 2018.
North Pointe
Holiday Inn
Juniper Ridge
Highland
North Wind
Rhoenix
Boyd Acres
N. Fire Station
Canal View
Majestic
Glen Vista
Rim Rock Riders
Quail Crossing
Service Station
Rim Rock #1
Rim Rock #2
Rim Rock #4
Rim Rock #5
Wyndemere
Enchant on Deschutes
Empire Village
Empire Estates
Deschutes Business
Empire I
Awbrey Glen
Sawyer Park
Rivers Edge
Shevlin Commons
Renaissance
Riverhouse
Glenshire
Summit Park
Tumalo Heights
Underwood
Shevlin Meadows
Linster
Pioneer
Westside
Riviera
Pacific
Forum
Drake
Colorado
Renwick
Hollow Pines #2
Main Fire Station
Hollow Pines #1
Old Mill
Desert Skies
Darnell Estates
Touchmark
Wood River Village
Simplicity
Orion Greens
Sunrise #1
Tri Peaks
Nottingham #1
Bachelor Village
Foxborough
Pine Ridge
The Shire
Nottingham #2
Sun Meadow
Ridgewater #1
River Canyon #2
Pheasant Run
Camden Park
Stone Haven
Aspen Ridge
Shadow Glen
Ridgewater #2
South Village
Deschutes River Crossing
Murphy
River Canyon #1
Crown Villa #1
Crown Villa #2
Pines #5
River Rim
Pines #6
Pines #7
Quail Ridge #2
Quail Ridge #1
Poplar Park
Widgi Creek
Blue Ridge
20
97
0
4,000 Feet
murraysmith
City of Bend
Public Facility Plan
Figure 1
Existing System:
Gravity Pipe
Diameter
N
W
E
S
BEND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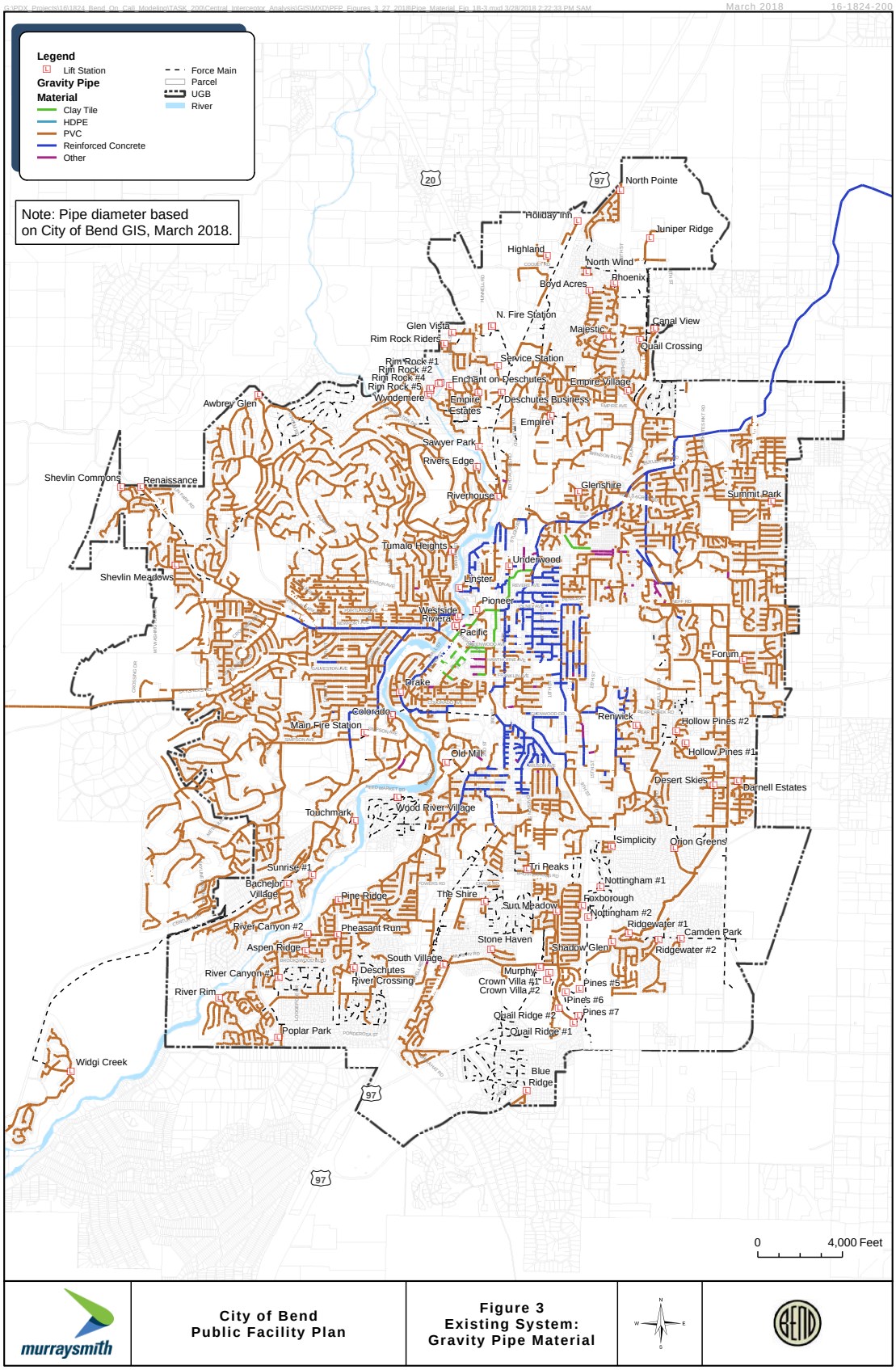
March 2018
16-1824-200
Legend
Lift Station
Force Main
Gravity Pipe
Parcel
Installation Year
UGB
River
pre 1960
1960 - 1969
1970-1979
1980-1989
1990-1999
2000-2009
2009-2017
Note: Pipe diameter based on City of Bend GIS, March 2018.
North Pointe
Holiday Inn
Juniper Ridge
Highland
North Wind
Rhoenix
Boyd Acres
N. Fire Station
Glen Vista
Rim Rock Riders
Majestic
Canal View
Quail Crossing
Rim Rock #1
Rim Rock #2
Rim Rock #4
Rim Rock #5
Wyndemere
Service Station
Enchant on Deschutes
Empire Village
Empire Estates
Deschutes Business
Empire
Awbrey Glen
Sawyer Park
Rivers Edge
Shevlin Commons
Renaissance
Riverhouse
Glenshire
Summit Park
Tumalo Heights
Underwood
Shevlin Meadows
Bunster
Pioneer
Westside
Riviera
Pacific
Forum
Drake
Colorado
Renwick
Main Fire Station
Hollow Pines #2
Old Mill
Hollow Pines #1
Desert Skies
Barnell Estates
Touchmark
Wood River Village
Simplicity
Onion Greens
Sunrise #1
Tri Peaks
Nottingham #1
Bachelor Village
Pine Ridge
The Shire
Foxborough
Sun Meadow
Nottingham #2
Ridgewater #1
River Canyon #2
Pheasant Run
Camden Park
Stone Haven
Aspen Ridge
Shadow Glen
Ridgewater #2
South Village
Deschutes River Crossing
Murphy
River Canyon #1
Crown Villa #1
Crown Villa #2
Pines #5
Pines #6
River Rim
Pines #7
Quail Ridge #2
Quail Ridge #1
Poplar Park
Widgi Creek
Blue Ridge
20
97
0
4,000 Feet
murraysmith
City of Bend
Public Facility Plan
Figure 2
Existing System:
Gravity Pipe
Installation Year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March 2018
16-1824-200
Legend
Lift Station
Gravity Pipe Material
Clay Tile
HDPE
PVC
Reinforced Concrete
Other
Force Main
Parcel
UGB
River
Note: Pipe diameter based on City of Bend GIS, March 2018.
North Pointe
Holiday Inn
Juniper Ridge
Highland
North Wind
Phoenix
Boyd Acres
N. Fire Station
Glen Vista
Rim Rock Riders
Majestic
Canal View
Quail Crossing
Rim Rock #1
Rim Rock #2
Rim Rock #4
Rim Rock #5
Wyndemere
Service Station
Enchant on Deschutes
Empire Village
Deschutes Business
Empire Estates
Empire
Awbrey Glen
Sawyer Park
Rivers Edge
Shevlin Commons
Renaissance
Riverhouse
Glenshire
Summit Park
Tumalo Heights
Underwood
Linster
Shevlin Meadows
Pioneer
Westside
Riviera
Pacific
Forum
Drake
Colorado
Renwick
Hollow Pines #2
Main Fire Station
Old Mill
Hollow Pines #1
Desert Skies
Darnell Estates
Wood River Village
Touchmark
Simplicity
Orion Greens
Sunrise #1
Tri Peaks
Nottingham #1
Bachelor Village
Pine Ridge
The Shire
Foxborough
Sun Meadow
Nottingham #2
Ridgewater #1
River Canyon #2
Pheasant Run
Camden Park
Stone Haven
Aspen Ridge
Shadow Glen
Ridgewater #2
South Village
Deschutes River Crossing
River Canyon #1
Murphy
Crown Villa #1
Crown Villa #2
Pines #5
Pines #6
Pines #7
River Rim
Quail Ridge #2
Quail Ridge #1
Poplar Park
Widgi Creek
Blue Ridge
97
20
0
4,000 Feet
City of Bend
Public Facility Plan
Figure 3
Existing System:
Gravity Pipe Material
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Most of the gravity collection system has been constructed since the late 1970s, when the City received federal funding to construct a centralized wastewater treatment plant. The piping is generally in good condition. The Public Works Department maintains a GIS database of the collection system that summarizes the size, material, and age of the system components.

The O&M Department inspects the gravity collection system through CCTV and, approximately half of the gravity collection system had been inspected and rated. The inspections include a standardized rating index utilizing the National Association of Sewer Service Companies (NAASCO), Pipeline Assessment & Certification Program (PACP) inspection guidelines. Consistency of rating has improved with operator training between 2008 and 2012. The O&M Department has acknowledged a need to re-inspect all piping with a rating of 5 and other known high-risk infrastructure such as the Addison pipeline. The rating index assigns values to defects in pipe segments which are compiled into a composite rating for each pipeline. The O&M Department has used the rating to assign condition according to the categories shown in Table 4. The gravity collection system condition assessment using these condition categories is presented in Figure 4, and is summarized in Table 5 by age, Table 6 by size, and Table 7 by material.

Table 4
Gravity Pipe Condition Assessment by Category

Condition Rating	Condition Assessment	Length (mile)
0 and 1	Failure Unlikely in Foreseeable Future	150
2	Pipe Unlikely to Fail For 20 Years	7
3	Pipe May Fail in 10-20 Years	5
4	Pipe Will Probably Fail in 5-10 Years	2
5	Pipe Has Failed or Will Fail Within 5 Years	1
Not Rated	Not Rated to Date	215

Table 5
Gravity Pipe Condition Assessment by Age

Rating	Installation Year - Percentage							
	Pre 1970	1970 to 1979	1980 to 1989	1990 to 1999	2000 to 2013	Unknown	2014 to 2018[1]	Total
0	0.5%	7.6%	1.7%	11.6%	16.3%	0.6%	0.0%	**38.2%**
1	0.0%	0.6%	0.1%	0.4%	0.2%	0.0%	0.0%	**1.3%**
2	0.0%	0.8%	0.1%	0.4%	0.4%	0.1%	0.0%	**1.8%**
3	0.1%	0.9%	0.0%	0.1%	0.1%	0.0%	0.0%	**1.3%**
4	0.0%	0.3%	0.0%	0.2%	0.0%	0.0%	0.0%	**0.6%**
5	0.0%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	**0.3%**
Not Rated	0.2%	12.9%	4.6%	13.7%	17.8%	0.0%	7.2%	**56.5%**
Total	**0.9%**	**23.2%**	**6.6%**	**26.5%**	**34.9%**	**0.7%**	**7.2%**	**100.0%**

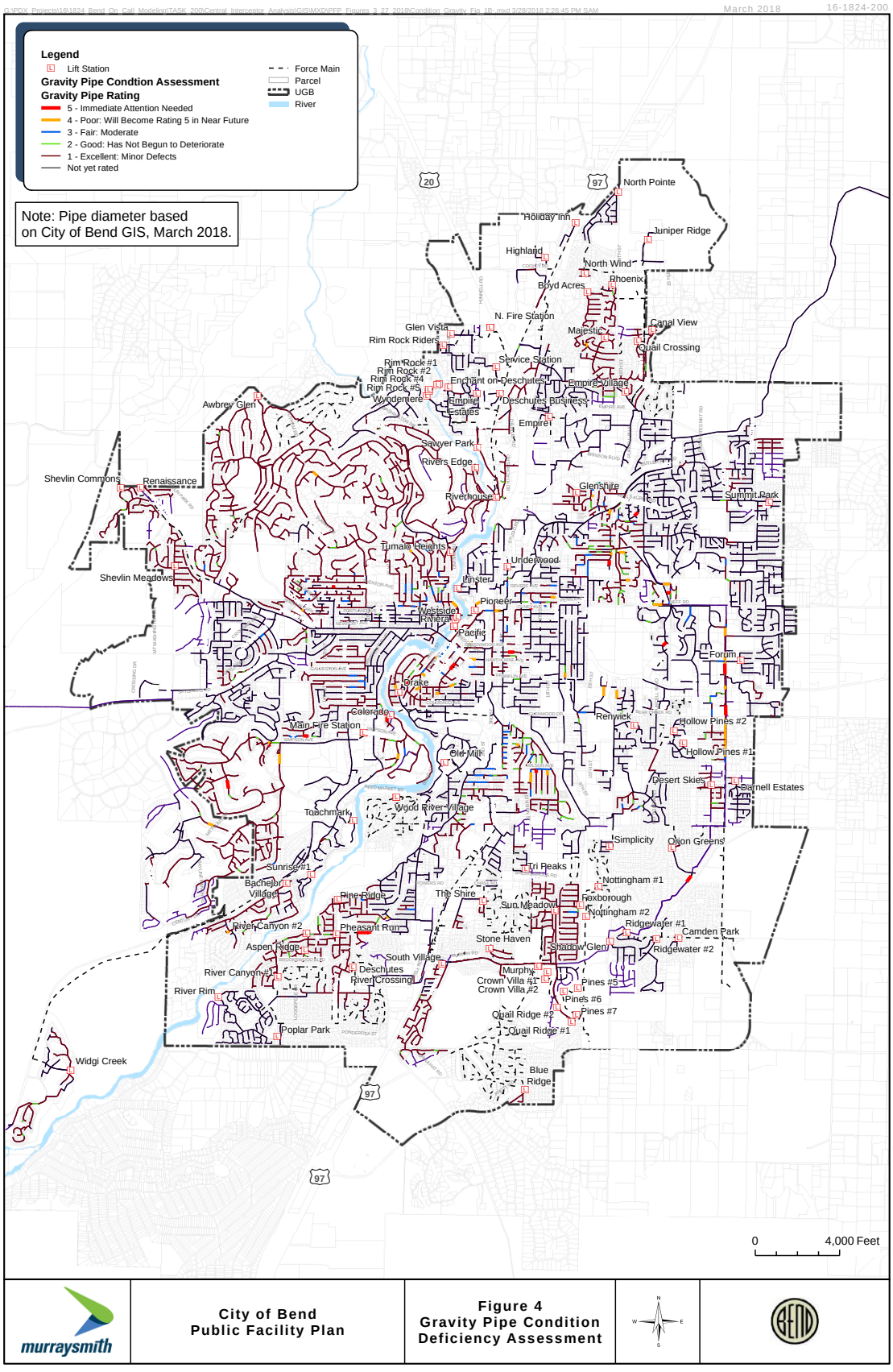
1 Includes projects since CSMP was published in 2014.

Table 6
Gravity Pipe Condition Assessment by Size

Rating	Diameter (inch) - Percentage							
	3 to 6	8	10 to 12	14 to 18	20 to 24	26 to 30	32 to 72	Total
0	0.9%	34.3%	2.0%	0.7%	0.1%	0.0%	0.0%	**38.0%**
1	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	**1.3%**
2	0.1%	1.6%	0.1%	0.0%	0.0%	0.0%	0.0%	**1.8%**
3	0.1%	1.1%	0.1%	0.1%	0.0%	0.0%	0.0%	**1.3%**
4	0.0%	0.4%	0.0%	0.1%	0.0%	0.0%	0.0%	**0.6%**
5	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.3%**
Not Rated	2.3%	42.4%	4.1%	2.7%	2.2%	1.7%	1.4%	**56.8%**
Total	**3.4%**	**81.3%**	**6.3%**	**3.5%**	**2.3%**	**1.8%**	**1.4%**	**100.0%**

Table 7
Gravity Pipe Condition Assessment by Material

Rating	Material - Percentage						
	Polyvinyl Chloride	High Density Polyethylene	Concrete (AC, RCP, Non-Reinforced)	Cast Iron and Ductile Iron Pipe	Clay (CT, VCD, TP)	Unknown	Total
0	36.0%	0.3%	1.3%	0.0%	0.4%	0.0%	**38.0%**
1	1.1%	0.0%	0.2%	0.0%	0.0%	0.0%	**1.3%**
2	1.4%	0.1%	0.3%	0.0%	0.0%	0.0%	**1.8%**
3	0.9%	0.0%	0.3%	0.0%	0.1%	0.0%	**1.3%**
4	0.5%	0.0%	0.1%	0.0%	0.0%	0.0%	**0.6%**
5	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.3%**
Not Rated	49.7%	0.1%	6.8%	0.1%	0.2%	0.0%	**56.8%**
Total	**89.7%**	**0.4%**	**9.0%**	**0.1%**	**0.8%**	**0.0%**	**100.0%**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March 2018
16-1824-200
Legend
Lift Station
Gravity Pipe Condtion Assessment
Gravity Pipe Rating
5 - Immediate Attention Needed
4 - Poor: Will Become Rating 5 in Near Future
3 - Fair: Moderate
2 - Good: Has Not Begun to Deteriorate
1 - Excellent: Minor Defects
Not yet rated
Force Main
Parcel
UGB
River
Note: Pipe diameter based on City of Bend GIS, March 2018.
20
97
North Pointe
Holiday Inn
Juniper Ridge
Highland
North Wind
Phoenix
Boyd Acres
N. Fire Station
Glen Vista
Rim Rock Riders
Majestic
Canal View
Quail Crossing
Service Station
Rim Rock #1
Rim Rock #2
Rim Rock #4
Rim Rock #5
Wyndemere
Enchant on Deschutes
Empire Village
Deschutes Business
Empire Estates
Empire
Awbrey Glen
Sawyer Park
Rivers Edge
Shevlin Commons
Renaissance
Riverhouse
Glenshire
Summit Park
Tumalo Heights
Underwood
Shevlin Meadows
Pioneer
Westside
Pacific
Forum
Drake
Colorado
Renwick
Hollow Pines #2
Main Fire Station
Elk Mill
Hollow Pines #1
Desert Skies
Barnell Estates
Wood River Village
Touchmark
Simplicity
Onion Greens
Sunrise #1
Tri Peaks
Nottingham #1
Bachelor Village
Pine Ridge
The Shire
Foxborough
Sun Meadow
Nottingham #2
Ridgewater #1
River Canyon #2
Pheasant Run
Camden Park
Stone Haven
Aspen Ridge
Shadow Glen
Ridgewater #2
South Village
Deschutes River Crossing
River Canyon #1
Murphy
Crown Villa #1
Crown Villa #2
Pines #5
Pines #6
Pines #7
River Rim
Quail Ridge #2
Quail Ridge #1
Poplar Park
Widgi Creek
Blue Ridge
0
4,000 Feet
murraysmith
City of Bend
Public Facility Plan
Figure 4
Gravity Pipe Condition
Deficiency Assessment

Condition Rating of Lift Stations

The City's primary wastewater collection system currently includes 86 regional lift stations. There are many residential lift stations that are not part of the primary collection system. City-owned regional lift stations can be further broken down into two categories, Regional Modeled and Localized Not-Modeled as documented in the 2014 CSMP. Regional Modeled lift stations typically collect sewage from a large region and are included and calibrated in the hydraulic model. Localized Not-Modeled lift stations such as the Pines (5, 6, 7), Quail Ridge (1, 2), Crown Villa (1, 2), and Nottingham (1, 2) are local in nature but are not included in the hydraulic model because they have limited or no gravity piping in their contributory basin. Several lift stations included in the inventory are in the process of being decommissioned including Ridgewater 1, Shadow Glen, Murphy, and Sun Meadow. Table 8 summarizes the lift stations by owner and category. Historically, lift stations have been installed for multiple reasons, including adverse grade, the need to cross a river or other restrictive corridors, or simply as an alternative to more costly gravity piping. Figure 5 shows the lift station locations throughout the system.

Table 8
Lift Stations within the Primary Collection System

Owner	Category	Number
City	Regional - Modeled	68
	Localized – Not-Modeled	18

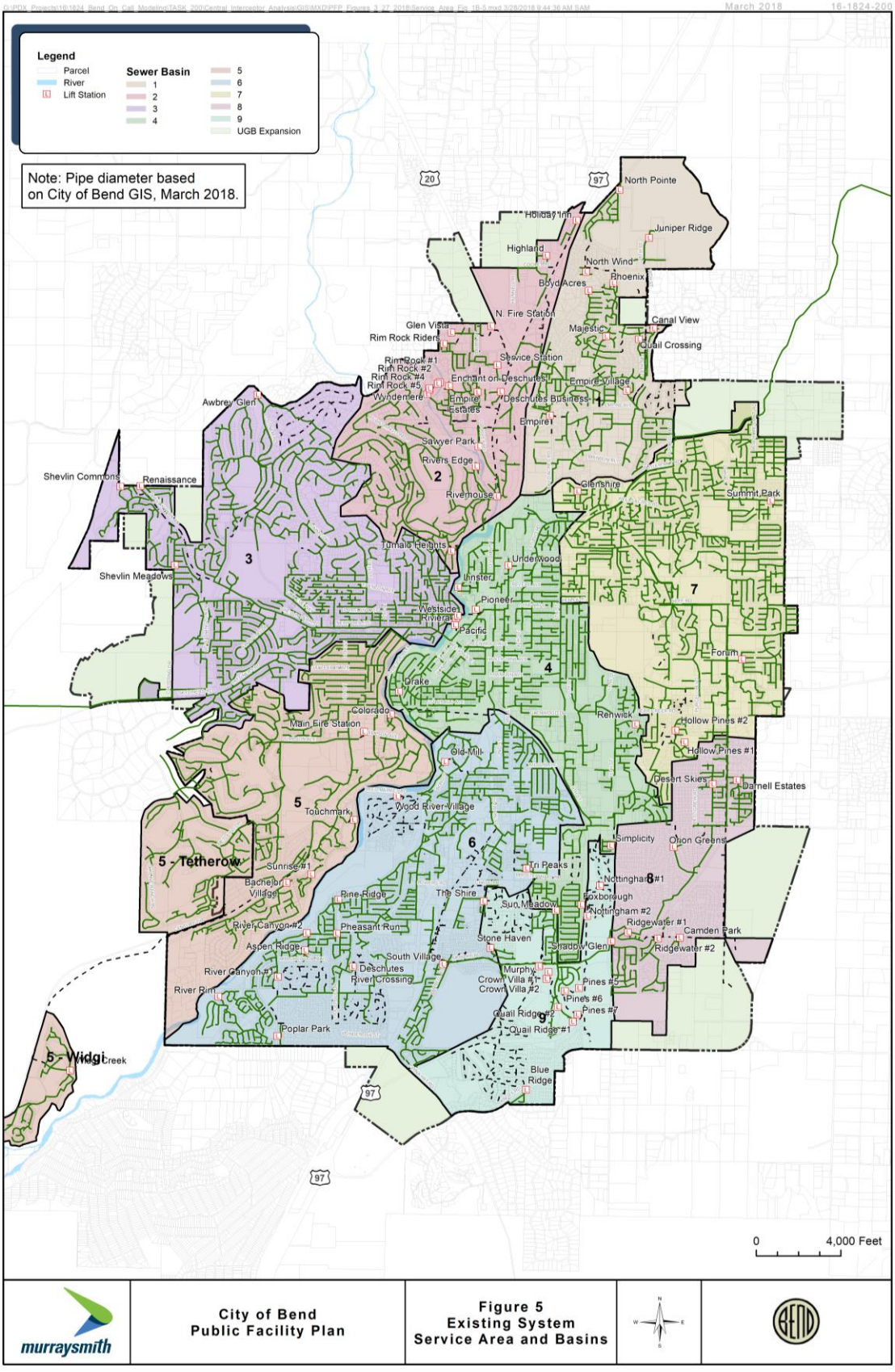
Table 9 includes a summary of the City's existing lift stations. Some lift stations have the pumps submerged in the wet well where the sewage is stored; others isolate the pumps from the wastewater using a dry well configuration connected by piping. The number of pumps in the lift station and total station horsepower are also listed in Table 9. Some of the lift stations have a variable frequency drive (VFD), which controls the frequency of the power to the pumps, allowing the pumps to operate at different speeds while pumping varied amounts of flow. Three benefits of VFD control are energy savings, controlled performance and phase conversion. VFDs are sometimes utilized to maintain a constant wet well level by matching pump output to the flow entering the facility. This mode of operation can have the added benefit of reducing onsite and downstream odors by reducing the time that wastewater is detained at the wet well. Phase conversion is the use of a VFD to create three-phase power from a single-phase power source. Backup power for the lift stations (as shown in Table 9), is used in the event of a power outage. Some of the lift stations have an onsite generator present. Other lift stations have the ability to connect to a portable generator during prolonged power outages.

Table 9
Summary of Bend's Existing Lift Stations

Basin	Lift Station Name	Type	Number of Pumps	Horsepower	VFD	Standby Power
1	Boyd Acres	Submersible	2	12	-	Plug
1	Canal View	Submersible	2	10	VFD	Plug
1	Empire	Submersible	2	10	-	Plug
1	Empire Village	Submersible	2	6	VFD	Plug
1	Juniper Ridge	Submersible	2	46	VFD	Standby
1	Majestic	Submersible	2	10	VFD	Plug
1	North Pointe	Submersible	2	80	-	Standby
1	North Wind	Submersible	2	40	-	Plug
1	Phoenix	Submersible	2	30	VFD	Plug
1	Quail Crossing	Submersible	2	10	VFD	Plug
2	Deschutes Business	Submersible	2	10	-	Plug
2	Empire Estates (Tuscan Pines)	Submersible	2	40	VFD	Plug
2	Enchant on Deschutes	Submersible	2	60	-	Plug
2	Glen Vista	Submersible	2	46	-	Plug
2	Highland	Submersible	2	50	-	Plug
2	Holiday Inn	Submersible	2	46	-	Plug
2	N. Fire Station	Submersible	3	6	-	Standby
2	Rim Rock #1	Submersible	2	2	-	Plug
2	Rim Rock #2	Submersible	2	2	-	Plug
2	Rim Rock #4	Submersible	2	2	-	Plug
2	Rim Rock #5	Submersible	2	2	-	Plug
2	Rim Rock Riders	Submersible	2	40	-	Plug
2	Riverhouse	Wet Well/ Dry Well	2	15	-	Standby
2	Rivers Edge	Submersible	2	15	-	Plug
2	Sawyer Park	Submersible	4	57	VFD	Standby
2	Service Station	Submersible	2	9	-	Plug
2	Wyndemere	Submersible	3	45	VFD	Standby
3	Awbrey Glen	Wet Well/ Dry Well	5	300	-	Plug
3	Renaissance	Submersible	2	62	-	Plug
3	Riviera	Submersible	2	10	-	Standby
3	Shevlin Commons	Submersible	2	40	-	Plug
3	Shevlin Meadows	Submersible	2	20	VFD	Plug
3	Tumalo Heights	Submersible	2	15	VFD	Plug
4	Drake	Wet Well/ Dry Well	1	28	-	Standby
4	Foxborough	Submersible	2	30	-	Plug

Basin	Lift Station Name	Type	Number of Pumps	Horsepower	VFD	Standby Power
4	Linster	Submersible	2	15	-	Plug
4	Pacific	Submersible	2	4	-	Plug
4	Pioneer	Submersible	2	4	-	Plug
4	Renwick	Wet Well/ Dry Well	2	6	-	Plug
4	Simplicity	Submersible	2	15	-	Plug
4	Sun Meadow (decommissioning)	Submersible	2	100	-	Plug
4	Underwood	Wet Well/ Dry Well	2	6	-	Plug
4	West Side	Wet Well/ Dry Well	4	170	VFD	Standby
5	Bachelor Village	Submersible	2	20	-	
5	Main Fire Station	Submersible	2	4	-	Standby
5	Colorado	Wet Well/ Dry Well	3	85	VFD	Standby
5	Sunrise #1	Submersible	2	15	-	Plug
5	Touchmark	Submersible	2	40	-	Standby
5	Widgi Creek	Submersible	2	80	Soft Start	Plug
6	Aspen Ridge	Submersible	2	50	-	Plug
6	Des. River Crossing	Submersible	2	10	-	Plug
6	Old Mill	Submersible	2	30	VFD	Standby
6	Pheasant Run	Submersible	2	10	VFD	Plug
6	Pine Ridge	Submersible	2	10	VFD	Plug
6	Poplar Park	Submersible	2	10	VFD	Plug
6	River Canyon #1	Submersible	2	15	-	Plug
6	River Canyon #2	Submersible	2	20	-	Plug
6	River Rim	Submersible	2	20	-	Plug
6	South Village	Submersible	2	40	-	Plug
6	Stone Haven	Submersible	2	10	-	Plug
6	The Shire	Submersible	2	40	-	Plug
6	Tri Peaks	Submersible	2	10	VFD	Plug
6	Wood River Village	Vacuum Station and Dry Well	2	60	-	Standby
7	Forum	Submersible	2	2	-	Plug
7	Glenshire	Submersible	2	10	VFD	Plug
7	Hollow Pines	Submersible	2	13	VFD	Plug
7	Hollow Pines #2	Submersible	2	10	-	Plug
7	Summit Park	Submersible	2	10	-	Plug
8	Camden	Submersible	2	15	VFD	Plug

Basin	Lift Station Name	Type	Number of Pumps	Horsepower	VFD	Standby Power
8	Darnell Estates	Submersible	2	10	VFD	Plug
8	Desert Skies	Submersible	2	10	VFD	Plug
8	Orion Greens	Submersible	2	20	-	Standby
8	Ridgewater (decommissioning)	Submersible	2	13	-	Plug
8	Ridgewater #2	Submersible	2	20	-	Plug
9	Blue Ridge	Submersible	2	10	-	Plug
9	Crown Villa #1	Submersible	2	2	-	Plug
9	Crown Villa #2	Submersible	2	2	-	Plug
9	Murphy Interim (decommissioning)	Submersible	2	60	-	Standby
9	Nottingham #1	Submersible	2	2	-	Plug
9	Nottingham #2	Submersible	2	20	-	Plug
9	Pines #5	Submersible	2	4	-	Plug
9	Pines #6	Submersible	2	4	-	Plug
9	Pines #7	Submersible	2	34	-	Plug
9	Quail Ridge #1	Submersible	2	2	-	Plug
9	Quail Ridge #2	Submersible	2	2	-	Plug
9	Shadow Glen (decommissioning)	Submersible	2	13	VFD	Standby


Legend
Parcel
River
Lift Station
Sewer Basin
1
2
3
4
5
6
7
8
9
UGB Expansion
Note: Pipe diameter based on City of Bend GIS, March 2018.
North Pointe
Holiday Inn
Juniper Ridge
Highland
North Wind
Rhoenix
Boyd Acres
N. Fire Station
Canal View
Majestic
Quail Crossing
Glen Vista
Rim Rock Riders
Rim Rock #1
Rim Rock #2
Rim Rock #4
Rim Rock #5
Wyndemere
Service Station
Enchant on Deschutes
Empire Village
Deschutes Business
Empire Estates
Empire
Awbrey Glen
Sawyer Park
Rivers Edge
Riverhouse
Shevlin Commons
Renaissance
Glenshire
Summit Park
Tumalo Heights
Shevlin Meadows
Urdel Wood
Forum
Pioneer
Westside
Riviera
Pacific
Drake
Colorado
Main Fire Station
Renwick
Hollow Pines #2
Hollow Pines #1
Old Mill
Desert Skies
Darnell Estates
Touchmark
Wood River Village
Simplicity
Olson Greens
5 - Tetherow
Sunrise #1
Bachelor Village
Tri Peaks
Nottingham #1
Pine Ridge
The Shire
Sun Meadow
Foxborough
Nottingham #2
Ridgewater #1
Camden Park
Ridgewater #2
River Canyon #2
Pheasant Run
Stone Haven
Shadow Glen
Aspen Ridge
South Village
River Canyon #1
Deschutes River Crossing
Murphy
Crown Villa #1
Crown Villa #2
Pines #5
Pines #6
Pines #7
River Rim
Quail Ridge #2
Quail Ridge #1
Poplar Park
5 - Widgi
Blue Ridge
20
97
0
4,000 Feet
City of Bend
Public Facility Plan
Figure 5
Existing System
Service Area and Basins
murraysmith

Lift station capacity is summarized in Table 10. For lift stations that share common force mains, the capacity may be limited by the number of lift stations operating at any time within the group. The documented total capacity is based on the individual lift station operating with all pumps, but with other lift stations not operating within the group. The firm capacity (the capacity with the largest pump out of service) is also listed with and without other lift stations within the group operating. The capacity of the force main associated with each lift station is also summarized in Table 10. This value is the calculated flow through the force main: Dry weather capacity is calculated at a velocity of 6 ft/sec and wet weather capacity at 10 ft/sec. Force main capacity was included to determine if velocity constraints are the limiting factor in lift station capacity.

Table 10
Lift Station Capacity

Basin	Lift Station Name	Station Pumping Capacity[1] (gpm)	Station Firm Pumping Capacity[2] (gpm)	Station Firm Pumping Capacity Group[3] (gpm	Discharge Diameter[4] (inch)	Dry Weather Discharge Line Capacity at 6 ft/sec[5] (gpm)	Wet Weather Discharge Line Capacity at 10 ft/sec[6] (gpm)
1	Boyd Acres	80	75	n/a	3	132	220
1	Canal View	90	75	55	4	235	392
1	Empire	190	160	n/a	4	235	392
1	Empire Village	350	200	n/a	4	235	392
1	Juniper Ridge	570	440	360	6	529	881
1	Majestic	275	240	n/a	6	529	881
1	North Pointe	320	300	130	6	529	881
1	North Wind	370	350	60	6	529	881
1	Phoenix	500	430	220	6	529	881
1	Quail Crossing	260	180	40	6	529	881
2	Deschutes Business	175	140	4	4	235	392
2	Empire Estates	140	130	28	3	132	220
2	Enchant on Deschutes	155	150	12	4	235	392
2	Glen Vista	260	235	150	6	529	881
2	Highland	170	160	160	4	235	392
2	Holiday Inn	170	160	30	4	235	392
2	N. Fire Station	120	80	n/a	3	132	220
2	Rim Rock #1	80	40	n/a	2	59	98
2	Rim Rock #2	80	40	n/a	2	59	98
2	Rim Rock #4	80	40	n/a	2	59	98
2	Rim Rock #5	80	40	n/a	2	59	98
2	Rim Rock Riders	145	140	30	4	235	392
2	Riverhouse	290	275	2	6	529	881
2	River's Edge	190	160	n/a	3	132	220
2	Sawyer Park	400	380	300	8/10	940	1,567
2	Service Station	110	95	12	4	235	392
2	Wyndemere	280	270	30	6	529	881
3	Awbrey Glen	770	630	n/a	8	940	1,567
3	Renaissance	135	127	40	4	235	392
3	Riviera	284	142	n/a	4	235	392
3	Shevlin Commons	115	110	75	4	235	392
3	Shevlin Meadows	180	170	140	4	235	392

Basin	Lift Station Name	Station Pumping Capacity[1] (gpm)	Station Firm Pumping Capacity[2] (gpm)	Station Firm Pumping Capacity Group[3] (gpm	Discharge Diameter[4] (inch)	Dry Weather Discharge Line Capacity at 6 ft/sec[5] (gpm)	Wet Weather Discharge Line Capacity at 10 ft/sec[6] (gpm)
3	Tumalo Heights	275	225	n/a	4	235	392
4	Drake	875	780	n/a	6	529	881
4	Foxborough	430	420	n/a	6	529	881
4	Linster	165	150	n/a	4	235	392
4	Pacific	60	30	n/a	2	59	98
4	Pioneer	70	35	n/a	6	529	881
4	Renwick	80	40	n/a	4	235	392
4	Simplicity	280	240	n/a	4	235	392
4	Sun Meadow (decommissioning)	410	375	125	6	529	881
4	Underwood	150	135	n/a	4	235	392
4	West Side	4,700	4,200	n/a	16	3,760	6,267
5	Bachelor Village	205	185	n/a	4	235	392
5	Main Fire Station	80	40	n/a	2	59	98
5	Colorado	2,500	2,350	n/a	12 (dual)	2,115	3,525
5	Sunrise #1	275	250	175	4	235	392
5	Touchmark	550	400	n/a	6	529	881
5	Widgi Creek	200	190	185	6	529	881
6	Aspen Ridge	190	180	90	4	235	392
6	Des. River Crossing	150	140	n/a	4	235	392
6	Old Mill	400	290	n/a	6	529	881
6	Pheasant Run	210	180	n/a	4	235	392
6	Pine Ridge	110	90	n/a	4	235	392
6	Poplar Park	135	120	n/a	4	235	392
6	River Canyon #1	330	280	130	4	235	392
6	River Canyon #2	150	140	85	4	235	392
6	River Rim	170	150		4	235	392
6	South Village	590	420	400	6	529	881
6	Stone Haven	340	260	n/a	6	529	881
6	The Shire	180	170	n/a	4	235	392
6	Tri Peaks	100	90	n/a	3	132	220
6	Wood River Village	480	240	n/a	6	529	881
7	Forum	105	90	n/a	3	132	220
7	Glenshire	180	160	n/a	4	235	392
7	Hollow Pines	145	125	120	4	235	392
7	Hollow Pines #2	140	125	125	4	235	392

Basin	Lift Station Name	Station Pumping Capacity[1] (gpm)	Station Firm Pumping Capacity[2] (gpm)	Station Firm Pumping Capacity Group[3] (gpm	Discharge Diameter[4] (inch)	Dry Weather Discharge Line Capacity at 6 ft/sec[5] (gpm)	Wet Weather Discharge Line Capacity at 10 ft/sec[6] (gpm)
7	Summit Park	230	200	n/a	4	235	392
8	Camden	110	105	4	4	235	392
8	Darnell Estates	205	185	110	4	235	392
8	Desert Skies	165	150	110	4	235	392
8	Orion Greens	145	135	n/a	4	235	392
8	Ridgewater (decommissioning)	90	85	12	4	235	392
8	Ridgewater #2	130	120	75	4	235	392
9	Blue Ridge	65	62.5	n/a	3	132	220
9	Crown Villa #1	160	80	n/a	6	529	881
9	Crown Villa #2	160	80	n/a	6	529	881
9	Murphy Interim (decommissioning)	470	420	350	6	529	881
9	Nottingham #1	150	75	n/a	4	235	392
9	Nottingham #2	240	120	n/a	4	235	392
9	Pines #5	20	10	n/a	3	132	220
9	Pines #6	20	10	n/a	3	132	220
9	Pines #7	20	10	n/a	6	529	881
9	Quail Ridge #1	90	10	n/a	4	235	392
9	Quail Ridge #2	90	10	n/a	4	235	392
9	Shadow Glen (decommissioning)	130	120	50	6	529	881

[1] *Station Pumping Capacity - The lift station capacity with all pumps operating. Other lift stations sharing common force mains are not operating. This represents the maximum pumping capacity.*

[2] *Station Firm Pumping Capacity – The lift station capacity with the largest pump out of service. Other lift stations sharing common force mains are not operating.*

[3] *Station Firm Pumping Capacity – The lift station capacity with the largest pump out of service. Other lift stations sharing common force mains are operating. This represents the minimum pumping capacity. Some pump stations with varied size pumps will operate without simultaneous pump operation.*

[4] *Discharge Diameter - The diameter of the lift station force main.*

[5] *Dry Weather Discharge Line Capacity - Flow rate in lift station force main based on 6 ft/sec velocity. Does not indicate true capacity of combined lift station and force main.*

[6] *Wet Weather Discharge Line Capacity - Flow rate in lift station force main based on 10 ft/sec velocity. Does not indicate true capacity of combined lift station and force main.*

The O&M Department rated each of the City-owned lift stations in the collection system. The ratings were based on a review of the components summarized in Table 11.

Table 11
Lift Station Condition Assessment Summary Components

Category	Component	Category	Component
Pump	General Overall Condition	Pump House	General Overall Condition
	Pump ragging problems	Alarms and Sensor	General Overall Condition
	Impeller Damage or Wear		Recurring Alarm Failures
Motor	General Overall Condition		Recurring Sensor Failures
	Motor Connections	Electrical	General Overall Condition
Wet Well	General Overall Condition		Generator or Portable Pigtail
	Hatches/Safety Grate		HVAC
	Corrosion		Lighting
	Fats/Oils/Grease Buildup		Control Panel
	Solids Buildup		SCADA
	Expansion Tank	Site	General Overall Condition
Piping and Valves	General Overall Condition		Access/Security
	Piping		Drainage
	Valves		Overflow Impact

Individual ratings of the components were used to determine the composite rating for each lift station. O&M staff then reviewed and confirmed the final ratings. The general comments are provided below. The final ratings are summarized in Tables 12 through 15 and shown in Figure 6.

The tables are organized in the following categories:

- Table 12: Requires significant improvements immediately (included in the short-term, 1- to-5-year CIP)
- Table 13: Requires significant improvements within 5 years (included in the short-term, 1- to -5-year CIP)
- Table 14: Requires significant improvements within 10 years (included in the long-term, 6- to 10-year CIP).
- Table 15: In good condition requiring no major improvements within 10 years (included in the long-term, 11- to 20-year CIP)

For some lift stations, decommissioning may be accelerated to minimize or eliminate cost of condition repairs. The decommissioning is dependent on timing of key interceptor capital projects. Lift stations are flagged in Tables 12 to 15 to indicate where decommissioning may be an option.

General City of Bend O&M Staff Comments:

- There are numerous basins where pumps overpower other pumps, resulting in long run times, excessive electrical consumption, and risk of sanitary sewer overflow due to constrained lift station pump output.
- The average age of most lift stations is similar (installed during time of rapid growth in the early 2000s). This may result in operational and reliability problems, as these stations all reach the end of useful life at the same time.
- Many lift stations were built with poor quality and unreliable components (pumps and controls).
- Many lift station pumps operate at low efficiency points, consuming excess electricity.
- The large number of lift stations and limited staff restrict the capacity of the operations group to provide proactive maintenance.
- The existing SCADA system is data acquisition only. There is currently no Supervisory Control (remote control/operation).
- The large number of lift stations and limited staff restrict the capacity of the operations group to monitor lift station performance and place significant responsibility on the SCADA system to reliably track lift station function.
- Wood River Village Vacuum System has historically operated with minimal problems, but the pressure system is more difficult to isolate and locate vacuum leaks, which significantly increases the risk of sanitary sewer overflows and backups.
- Romaine Village Common Pressure Area has reasonably reliable systems, but it is overwhelming to check lift stations more than once per year due to number of individual pumping units (248, total). Home sumps create harsh wastewater environments, leading to hydrogen sulfide generation with associated odors and corrosion throughout the system.

Mechanical and electrical systems require improvements approximately every 20 years; therefore, all the City's lift stations include condition-based upgrades within the 20-year CIP timeframe.

Table 12
Lift Station Condition Assessment Summary - Requires Significant Improvements Immediately

Lift Station	Replacement Type	Decommissioning Note	O&M Comment
Crown Villa #1	Lift Station Overhaul	Lift station decommission being considered with completion of Southeast Interceptor. New gravity piping improvement required.	Station need to be completely overhauled. New pumps, discharge piping and electrical panel are needed.
Crown Villa #2	Lift Station Overhaul	Lift station decommission being considered with completion of Southeast Interceptor. New gravity piping improvement required.	Station need to be completely overhauled. New pumps, discharge piping and electrical panel are needed. Station also needs a control panel upgrade.
Deschutes Business	Lift Station Replacement		Old station. Original, obsolete pumps and obscurely sized discharge piping make this station extremely difficult to maintain. Wet well, discharge piping and valve pit are deteriorating due to corrosion. Expected to require pump replacement for future development.
Nottingham #1	Lift Station Replacement	Lift station decommission possible with completion of Southeast Interceptor. New gravity piping improvement required.	Aging, poorly designed station. Wet well is deteriorating, and discharge piping is very fragile. Pumps into Nottingham #2.
Nottingham #2	Lift Station Replacement	Lift station decommission possible with completion of Southeast Interceptor. New gravity piping improvement required.	Aging lift station. Corrosion is rapidly deteriorating pumps, piping and rail system. Pumps are obsolete. Entire subdivision pumps to this lift station, failure could be catastrophic. Some recent work to upgrade railing system.
Pacific	Lift Station Replacement		Old and deteriorating station. Extremely unsafe to access pumps and piping. Current pumping components are deficient and outdated. Located within close proximity of the Deschutes River.
Pioneer	Lift Station Replacement		Old and deteriorating station. Extremely unsafe to access pumps and piping. Current pumping components are deficient and outdated.
Quail Ridge #1	Lift Station Overhaul	Lift station decommission being considered with completion of Southeast Interceptor. New gravity piping improvement required.	Station needs to be completely overhauled. New pumps, discharge piping and electrical panel are needed.
Quail Ridge #2	Pump replacement/upgrade	Lift station decommission being considered with completion of Southeast Interceptor. New gravity piping improvement required.	Station needs to be completely overhauled. New pumps, discharge piping and electrical panel are needed.

Table 13
Lift Station Condition Assessment Summary - Requires Significant Improvements within 5 Years

Lift Station	Replacement Type	Decommissioning Note	O&M Comment
Awbrey Glen	Lift Station Overhaul		Needs a backup generator dedicated to the station. During storm events, this is often a very difficult station to get to (snow/ice) and we have very little time to get station running before it surcharges and causes an SSO.
Camden Park	Lift Station Overhaul	Lift station decommission possible with completion of Southeast Interceptor but may not occur immediately. New gravity piping improvement required.	Old station. Needs new pumps, rail system and electrical panel
Canal View	Sink Hole Issue (non-urgent)		Needs further assessment. There appears to be a sinkhole adjacent to the wet well, and control panel is sinking into the ground
Drake	Lift Station Replacement, Pump replacement/ upgrade		Older, obsolete design with vacuum priming system and small wet wells make this station hard to maintain.
Empire Village	Pump replacement		Pump replacement and VFDs
Poplar Park	Pump replacement/upgrade		Expected to require pump replacement in near future. Consider VFDs to minimize downstream impacts on Amethyst/ Mahogany Trunk Sewer.
Renwick	Lift Station Replacement		Older, obsolete design with vacuum priming system and small wet well makes station hard to maintain.
Rimrock #1	Lift Station Replacement		Very poorly designed. Grossly undersized for current flows. Small wet wells create difficulties in maintaining pumps and control floats. Proximity to river makes these sites a significant liability.
Rimrock #2	Lift Station Replacement		Very poorly designed. Grossly undersized for current flows. Small wet wells create difficulties in maintaining pumps and control floats. Proximity to river makes these sites a significant liability.
Rimrock #4	Lift Station Replacement		Very poorly designed. Grossly undersized for current flows. Small wet wells create difficulties in maintaining pumps and control floats. Proximity to river makes these sites a significant liability.
Rimrock #5	Lift Station Replacement		Very poorly designed. Grossly undersized for current flows. Small wet wells create difficulties in maintaining pumps and control floats. Proximity to river makes these sites a significant liability.

Lift Station	Replacement Type	Decommissioning Note	O&M Comment
Riverhouse	Lift Station Replacement		Older, obsolete design and small wet well make this station hard to maintain.
The Pines #5	Lift Station Upgrade	Lift station decommission may be possible with completion of Southeast Interceptor. New gravity piping improvement required.	Pumps and electrical in good condition. Station plumbing is insufficient.
The Pines #6	Lift Station Upgrade	Lift station decommission may be possible with completion of Southeast Interceptor. New gravity piping improvement required.	Pumps and electrical in good condition. Station plumbing is insufficient.
The Pines #7	Lift Station Upgrade	Lift station decommission may be possible with completion of Southeast Interceptor. New gravity piping improvement required.	Pumps and electrical in good condition. Station plumbing is insufficient.
Underwood	Lift Station Replacement		Replace Cornell older, obsolete design with vacuum priming system and small wet well makes station hard to maintain.

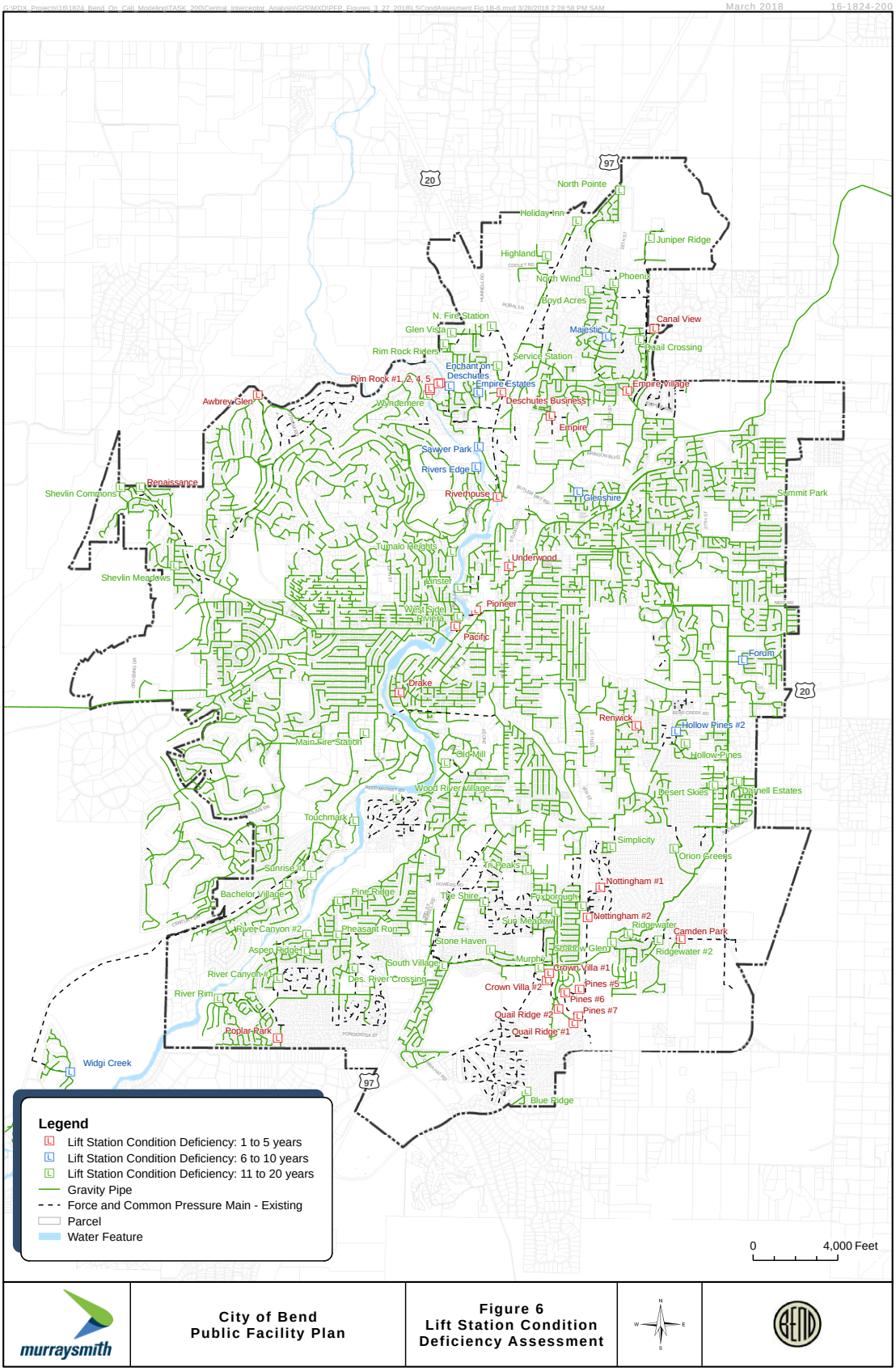
Table 14
Lift Station Condition Assessment Summary - Requires Significant Improvements between 6 and 10 Years

Lift Station	Replacement Type	Decommissioning Note	O&M Comment
Empire Estates (Tuscan Pines)	Pump replacement		Expected to require pump replacement in near future. Improved capacity with north area and Riverhouse reconfiguration.
Enchant on Deschutes	Pump replacement		Expected to require pump replacement in near future. Improved capacity with north area and Riverhouse reconfiguration. Improvement work recently performed, and project may be partially or fully completed.
Forum	Pump replacement	Lift station decommission possible with completion of Southeast Interceptor. New gravity piping improvement required.	City to replace pumps in near future
Glenshire	Pump replacement		Could use pump and VFD upgrade
Hollow Pines #2	Pump replacement		City to replace pumps and VFDs in near future
Majestic	-		Rail system is in poor condition/operations
Rivers Edge	-		City to replace pumps in near future. Improvement work recently performed, and project may be partially or fully completed.
Sawyer Park	-		Improved capacity with north area and Riverhouse LS reconfiguration
Widgi Creek	Lift Station Overhaul		Older pumps require upgrading. Rail system and electrical components need to be replaced. (Note: Existing agreement with Widgi Creek obligates them to upgrade if they expand. However, station needs overhaul, regardless.) Improvement work recently performed, and project may be partially or fully completed.

Table 15
Lift Station Condition Assessment Summary - In Good Condition, Requiring No Major Improvements within 10 Years

Lift Station	Replacement Type	Decommissioning Note	O&M Comment
Airport	-		-
Aspen Ridge	-		Consider VFDs to minimize downstream impacts on Amethyst/ Mahogany Trunk Sewer.
Bachelor Village	-		-
Blue Ridge	-		-
Boyd Acres	-	Lift station decommission possible with completion of North Interceptors Phases 1 and 2. New gravity piping improvement required.	-
Colorado	-		
Darnell Estates	-	Lift station decommission possible with completion of Southeast Interceptor. New gravity piping improvement required.	-
Deschutes River Crossing	-		Consider VFDs to minimize downstream impacts on Amethyst/ Mahogany Trunk Sewer.
Desert Skies	-	Lift station decommission possible with completion of Southeast Interceptor. New gravity piping improvement required.	-
Foxborough	-		-
Glen Vista	-	Lift station decommission possible with completion of North Interceptors Phases 1, 2, and 3. New gravity piping improvement required.	-
Highland	Pump replacement	Lift station decommission possible with completion of North Interceptors Phases 1 and 2. New gravity piping improvement required.	-
Holiday Inn	-	Lift station decommission possible with completion of North Interceptors Phases 1 and 2.	-
Hollow Pines #1	-		-
Juniper Ridge	-	Lift station decommission possible with completion of North Interceptors Phases 1 and 2. New gravity piping improvement required.	-
Linster	-		-
Main Fire Station	-		-
Murphy	-	Lift station decommissioned with completion of Southeast Interceptor.	-
North Pointe	Pump replacement	Lift station decommission possible with completion of North Interceptors Phases 1 and 2. New gravity piping improvement required.	Expected to require pump replacement in near future
N. Fire Station			
Northwind	Pump replacement	Lift station decommission possible with completion of North Interceptors Phases 1 and 2. New gravity piping improvement required.	Expected to require pump replacement in near future
Old Mill	Lift Station Overhaul, Pump replacement/ upgrade		Electrical components need upgraded (undersized for existing pumps). Expected to require pump replacement for future development
Orion Greens	-		-
Pheasant Run	-		-
Phoenix	-	Lift station decommission possible with completion of North Interceptors Phases 1 and 2. New gravity piping improvement required.	-
Pine Ridge	Pump replacement		Expected to require pump replacement as budget allows or when existing pumps fail.
Quail Crossing	-		Improved capacity with North Interceptor construction and associated North Area LS decommissioning
Renaissance	Pump replacement/upgrade		Expected to require pump replacement in near future. Coordinate with similar improvements at Shevlin Commons and Shevlin Meadows Lift Stations. Consider VFDs to minimize downstream impacts on Newport Avenue Trunk Sewer.

Lift Station	Replacement Type	Decommissioning Note	O&M Comment
Ridgewater #1	-	Lift station decommissioned with completion of Southeast Interceptor.	-
Ridgewater #2	-	Lift station decommission may be possible with completion of Southeast Interceptor. New gravity piping improvement required.	-
Rim Rock Riders	Pump replacement	Lift station decommission possible with completion of North Interceptors Phases 1, 2, and 3. New gravity piping improvement required.	Expected to require pump replacement in near future. Improved capacity with north area and Riverhouse reconfiguration.
River Canyon #1	-		Consider VFDs to minimize downstream impacts on Amethyst/ Mahogany Trunk Sewer.
River Canyon #2	-		Consider VFDs to minimize downstream impacts on Amethyst/ Mahogany Trunk Sewer.
River Rim	Pump replacement/ upgrade		Expected to require pump replacement for future development. Consider VFDs to minimize downstream impacts on Amethyst/ Mahogany Trunk Sewer.
Riviera	-		-
Service	Pump replacement		Expected to require pump replacement in near future. Improved capacity with north area and Riverhouse reconfiguration.
Shadow Glen	-	Lift station decommissioned with completion of Southeast Interceptor.	-
Shevlin Commons	Pump replacement/ upgrade		Expected to require pump replacement in near future. Coordinate with similar improvements at Renaissance and Shevlin Meadows Lift Stations. Consider VFDs to minimize downstream impacts on Newport Avenue Trunk Sewer.
Shevlin Meadows	Pump replacement/ upgrade		Expected to require pump replacement in near future. Coordinate with similar improvements at Renaissance and Shevlin Commons Lift Stations. Consider VFDs to minimize downstream impacts on Newport Avenue Trunk Sewer.
The Shire	Pump replacement	Lift station decommission possible with completion of Southeast Interceptor. New gravity piping improvement required.	-
Simplicity	Pump replacement	Lift station decommission possible with completion of Southeast Interceptor. New gravity piping improvement required.	-
South Village	Pump replacement	Lift station decommission possible with completion of Southeast Interceptor. New gravity piping improvement required.	-
Stone Haven	-	Lift station decommission possible with completion of Southeast Interceptor. New gravity piping improvement required.	-
Summit Park	-		-
Sun Meadow		Lift station decommissioned with completion of Southeast Interceptor.	-
Sunrise #1	Lift Station upgrade		New rail system required
Touchmark	Pump replacement		-
Tri Peaks	-	Lift station decommission possible with completion of Southeast Interceptor. New gravity piping improvement required.	-
Tumalo Heights	Pump replacement		-
Westside	-		-
Woodriver Village	-		Good working system, though unique to the rest of collection system
Wyndemere	-		Improved capacity with north area and Riverhouse LS reconfiguration



murraysmith	**City of Bend** **Public Facility Plan**	**Figure 6** **Lift Station Condition Deficiency Assessment**	N W E S	BEND

Condition Rating of Vacuum Sewer, Force Mains, and Common Pressure Mains

The City does not have a program to inspect force mains for condition information or routinely flush or clean force main pipe. All force mains in the system are single-pipe except for the Sawyer Park and Colorado lift stations which have dual-pipe systems. Single pipe systems must stay online to convey sewage. For this reason, it is difficult for the City to inspect force mains. However, as noted earlier in this section, the Public Works Department maintains a GIS database of the force main and pressure collection system, which includes size, material and original installation date. Poor pump operational efficiency may be a sign of a downstream force main or pressure main condition issue.

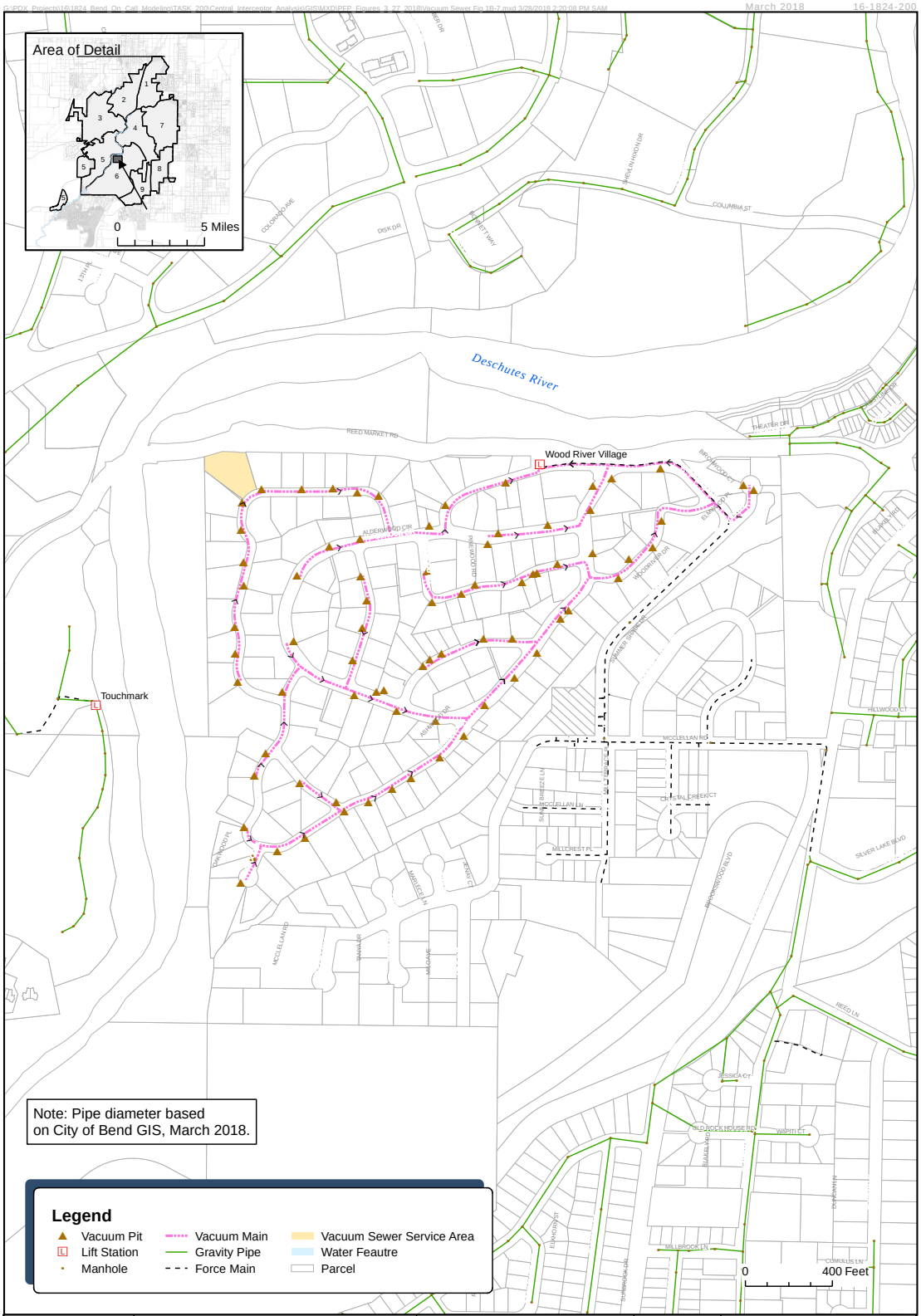
Vacuum Sewers

A vacuum sewer collection system serving 169 residential lots in the Wood River Village subdivision was installed in 2002 in the Wood River Village area, located just south of Reed Market Road along the east bank of the Deschutes River. The vacuum sewer service area is nearly at capacity and may require improvement with additional development.

The vacuum sewer system is comprised of an array of vacuum pits (each pit serving one to three residences), a vacuum sewer and a vacuum station. Traditional gravity pipes carry wastewater from each residence to the vacuum pit. The vacuum pit valve opens after an accumulation of sewage, and the vacuum pulls the sewage into the vacuum main; the vacuum pit valve then closes. The vacuum sewer is slightly sloped toward the vacuum station. At intervals, the vacuum sewer flows uphill by the differential pressure of the vacuum. Inside the vacuum main, wastewater travels between 15 and 18 feet per second (ft/sec). The vacuum main collects and directs sewage toward the vacuum station, which creates the vacuum and pumps the sewage in a traditional force main further downstream into the collection system. Based on information provided by the City, Table 16 summarizes the primary collection system's vacuum mains. Figure 7 presents the area served by the vacuum sewer system.

Table 16
Primary Collection System's Vacuum Sewer Mains

Diameter (inch)	Total Length (feet)	Percentage of Total Length
4	8,967	75.8%
6	2,865	24.2%
Total	**11,832**	**100%**



murraysmith	City of Bend Public Facility Plan	Figure 7 Existing System: Vacuum Sewer Service Area		

Force Mains and Common Pressure Mains

Similar to the method adopted to summarize gravity pipes, force main and common pressure main have been summarized by two attributes: Table 17 presents installation year and diameter, Table 18 installation year and material, and Table 19 material and diameter, and Figure 8 shows existing system force mains by diameter. The force main and common pressure mains total approximately 75 miles. The collection system has many lift stations not served by a dedicated force main. Rather, some force mains are connected to a common pressure main with multiple force mains tied-in to it. This type of connection can cause operational problems at lift stations. For instance, with one lift station pumping, a second lift station cannot effectively pump against the pack pressure created by the first lift station.

Table 17
Force Mains and Common Pressure Mains - Installation Year and Diameter Summary

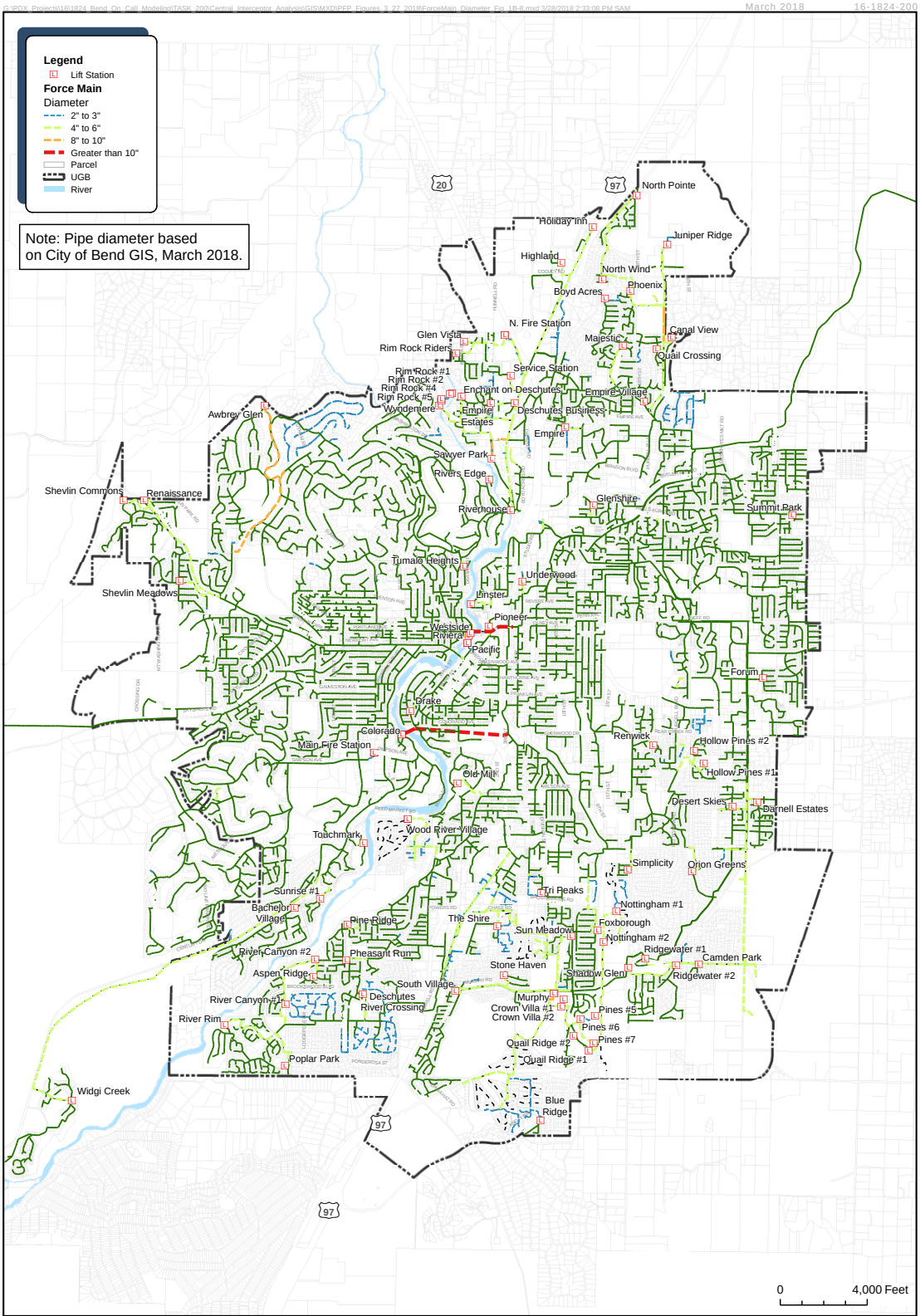
Diameter (inch)	Installation Year - Length (1,000 feet)						Percent
	Pre 1970	1970-1979	1980-1989	1990-1999	2000-2009	2010-2017	
2	0.0	0.9	0.0	1.3	2.6	0.2	**1%**
2.5	0.0	21.7	0.0	10.7	0.0	0.0	**8%**
3	1.3	8.8	0.8	17.6	72.3	4.1	**26%**
4	2.4	16.4	4.8	34.1	45.8	2.9	**27%**
6	0.2	11.2	12.1	45.2	39.3	0.1	**27%**
8	0.0	0.5	0.0	9.3	4.2	0.0	**4%**
10	0.0	0.0	0.0	0.0	3.4	4.2	**2%**
12	0.5	0.0	0.0	0.0	0.0	13.6	**4%**
16	0.6	2.1	0.0	0.0	2.9	0.0	**1%**
Percent	**1%**	**15%**	**4%**	**30%**	**43%**	**6%**	**100%**

Table 18
Force Mains and Common Pressure Mains - Installation Year and Material Summary

Material	Installation Year - Length (1,000 feet)						Percent
	Pre 1970	1970-1979	1980-1989	1990-1999	2000-2009	2010-2017	
Poly Vinyl Chloride	5.0	58.4	17.7	113.1	168.8	25.1	**98%**
Ductile Iron Pipe	0.0	2.1	0.0	4.8	1.6	0.0	**2%**
Cast Iron Pipe	0	1.1	0	0	0	0	**0%**
Percent	**1%**	**15%**	**4%**	**30%**	**43%**	**6%**	**100%**

Table 19
Force Mains and Common Pressure Mains - Material and Diameter Summary

Diameter (inch)	Material - Length (1,000 feet)			Percent
	Poly Vinyl Chloride	Ductile Iron Pipe	Cast Iron Pipe	
2	4.9	0.0	0.0	**1%**
2.5	32.3	0.0	0.0	**8%**
3	104.8	0.0	0.0	**26%**
4	105.3	0.0	1.1	**27%**
6	107.9	0.0	0.0	**27%**
8	7.6	6.4	0.0	**4%**
10	7.6	0.0	0.0	**2%**
12	14.1	0.0	0.0	**4%**
16	3.5	2.1	0.0	**1%**
Percent	**98%**	**2%**	**0%**	**100%**

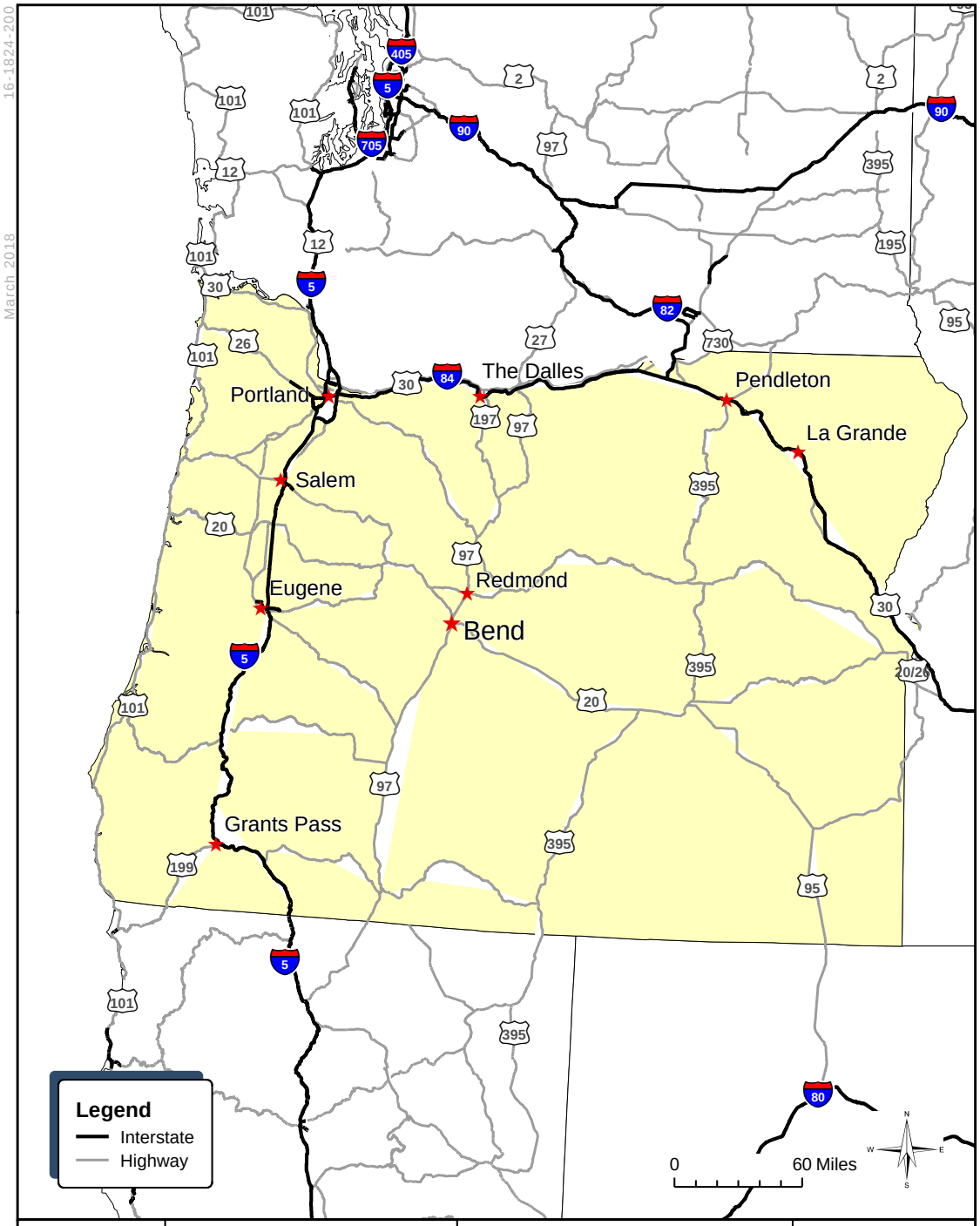

C:\PDX_Projects\16\1824_Bend_On_Call_Modeling\TASK_200\Central_Interceptor_Analysis\GIS\MXD\PFP_Figures_3_27_2018\ForceMain_Diameter_Fig_1B-8.mxd 3/28/2018 2:33:08 PM SAM
March 2018
16-1824-200
Legend
Lift Station
Force Main
Diameter
2" to 3"
4" to 6"
8" to 10"
Greater than 10"
Parcel
UGB
River
Note: Pipe diameter based on City of Bend GIS, March 2018.
North Pointe
Holiday Inn
Juniper Ridge
Highland
North Wind
Phoenix
Boyd Acres
N. Fire Station
Canal View
Majestic
Quail Crossing
Glen Vista
Rim Rock Riders
Rim Rock #1
Rim Rock #2
Rim Rock #4
Rim Rock #5
Wyndemere
Service Station
Enchant on Deschutes
Empire Village
Deschutes Business
Empire Estates
Empire
Awbrey Glen
Sawyer Park
Rivers Edge
Shevlin Commons
Renaissance
Riverhouse
Glenshire
Summit Park
Tumalo Heights
Underwood
Shevlin Meadows
Linster
Pioneer
Westside
Pacific
Forum
Drake
Colorado
Renwick
Hollow Pines #2
Main Fire Station
Old Mill
Hollow Pines #1
Desert Skies
Barnell Estates
Touchmark
Wood River Village
Simplicity
Onion Greens
Sunrise #1
Tri Peaks
Nottingham #1
Bachelor Village
The Shire
Foxborough
Pine Ridge
Sun Meadow
Nottingham #2
Ridgewater #1
River Canyon #2
Pheasant Run
Camden Park
Stone Haven
Aspen Ridge
Shadow Glen
Ridgewater #2
South Village
Deschutes River Crossing
Murphy
River Canyon #1
Crown Villa #1
Crown Villa #2
Pines #5
River Rim
Pines #6
Pines #7
Quail Ridge #2
Quail Ridge #1
Poplar Park
Widgi Creek
Blue Ridge
20
97
0
4,000 Feet
murraysmith
City of Bend
Public Facility Plan
Figure 8
Existing System
Force Main Diameter
N
W
E
S

OAR 660-011-0010(1)(d) General Location of Service Area

The City of Bend (City) is located in central Oregon, on the eastern edge of the Cascade Range. The City is located in Deschutes County, along the Deschutes River and to the east of the Three Sisters Mountains and Mount Bachelor. Elevation within the City varies considerably due to the river channel, Awbrey Butte and Pilot Butte, but the City's general elevation is 3,620 feet above mean sea level. The City covers an area of approximately 33.3 square miles.

The City owns and operates a collection system to manage and collect wastewater in the community. The primary collection system is comprised of City-owned lift stations, gravity pipelines, force main, and common pressure main sewer systems, exclusive of services; it contains approximately 380 miles of gravity pipeline and 75 miles of force main and common pressure sewer pipeline, and includes 86 regional lift stations, many of which convey flow through long force mains.

Figure 9 presents a regional map of Oregon showing the location of the City, and Figure 5 shows the primary collection system.


16-1824-200
March 2018
Portland
Salem
Eugene
Grants Pass
The Dalles
Pendleton
La Grande
Redmond
Bend
Legend
Interstate
Highway
0
60 Miles
N
W
E
S
City of Bend
Public Facility Plan
Figure 9
Existing System:
Regional Map
murraysmith

OAR 660-011-0010(1)(e) Provider(s) Identification

The City provides sewer service to residents and businesses within the UGB. There are no other sewer service providers, special districts or private utilities with which the City coordinates to provide wastewater collection and treatment. The City's sewer system includes a collection system, pump station, and interceptors which convey wastewater to the wastewater reclamation facility (WRF).

OAR 660-011-0010(1)(b) Public Facility Project Descriptions, OAR 660-011-0010(1)(c) Rough Cost Estimates, and OAR 660-011-0010(1)(f) Project Need-Time Estimate

This section includes background and descriptions of proposed projects associated with the City's collection system Capital Improvement Program (CIP).

Capacity Related Capital Project Development

Peak flow rates representing sanitary services and wet weather impacts within the City's UGB were considered to select capital improvements and evaluate improvement phasing. The CIP represents those projects required to serve projected growth within the 20-year planning horizon.

Development tiers or categories in the 1 to 5-year timeframe were identified by City staff to understand impacts to the system from near-term development including impacts of development prior to completion of the large interceptor projects. The tiered analysis was used to prioritize these key interceptor improvements and associated lift station decommissioning.

System loading or average wastewater flows were developed by applying unit wastewater factors to household and employment projections by parcel. Specific flow rates from development permits were used to replace generic assumptions where information was available. The unit wastewater factors were established from existing flow metering records at the WRF and review of wintertime water consumption records. Additional unit factors for schools and breweries were established from water consumption records. Unit flow factors are summarized in Table 20. Equivalent dwelling unit projections and average flow projections are shown in Figures 10 and 11 respectively for the 20-year planning horizon. Peak dry weather flows were established by applying hourly diurnal patterns to the average wastewater flows.

Table 20
Wastewater Average Dry Weather Unit Flow Factors

Unit Flow Factor Category	Unit Flow Factor (gallons-per-day, gpd)
Per Household	130
Per Employee	45
Brewery (per Acre)	6,300
School (per Acre)	350

Figure 10
Equivalent Dwelling Unit Projections by Development Category and Phasing

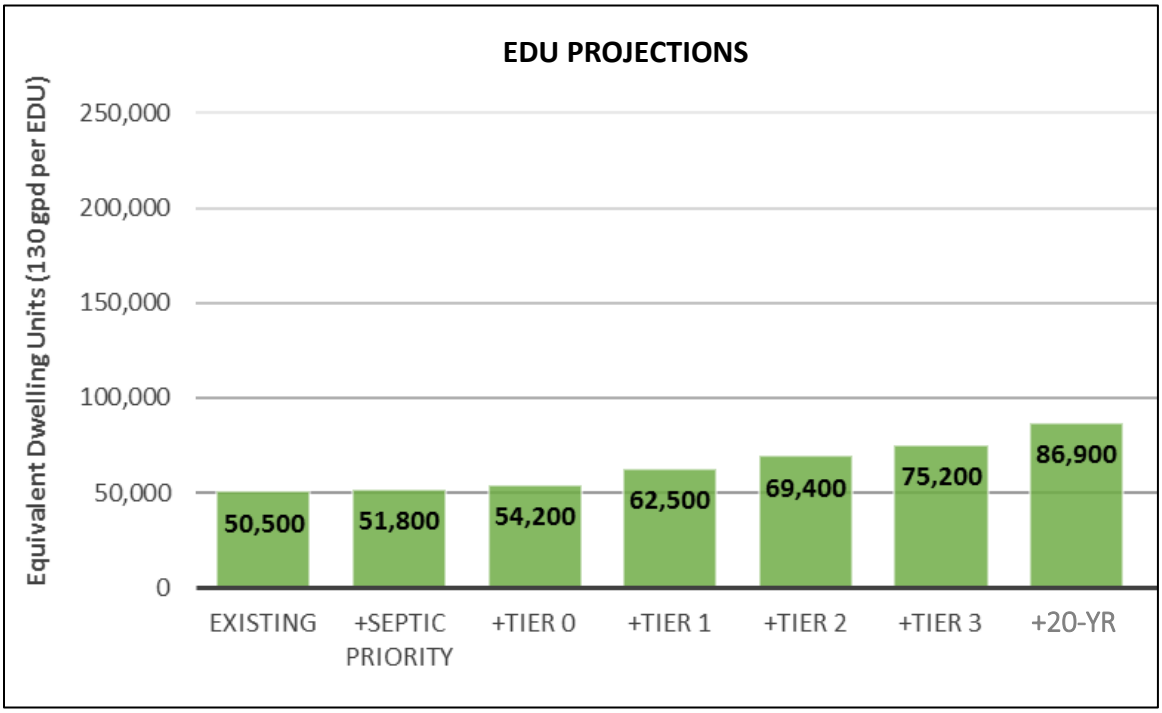
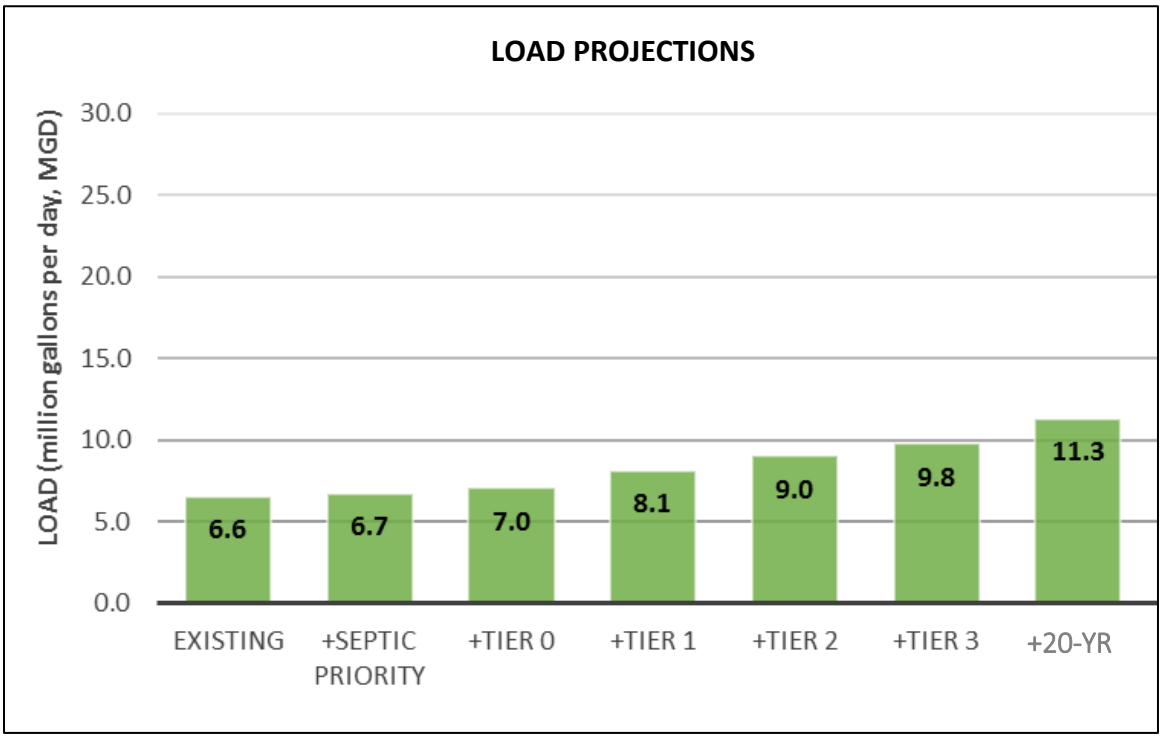


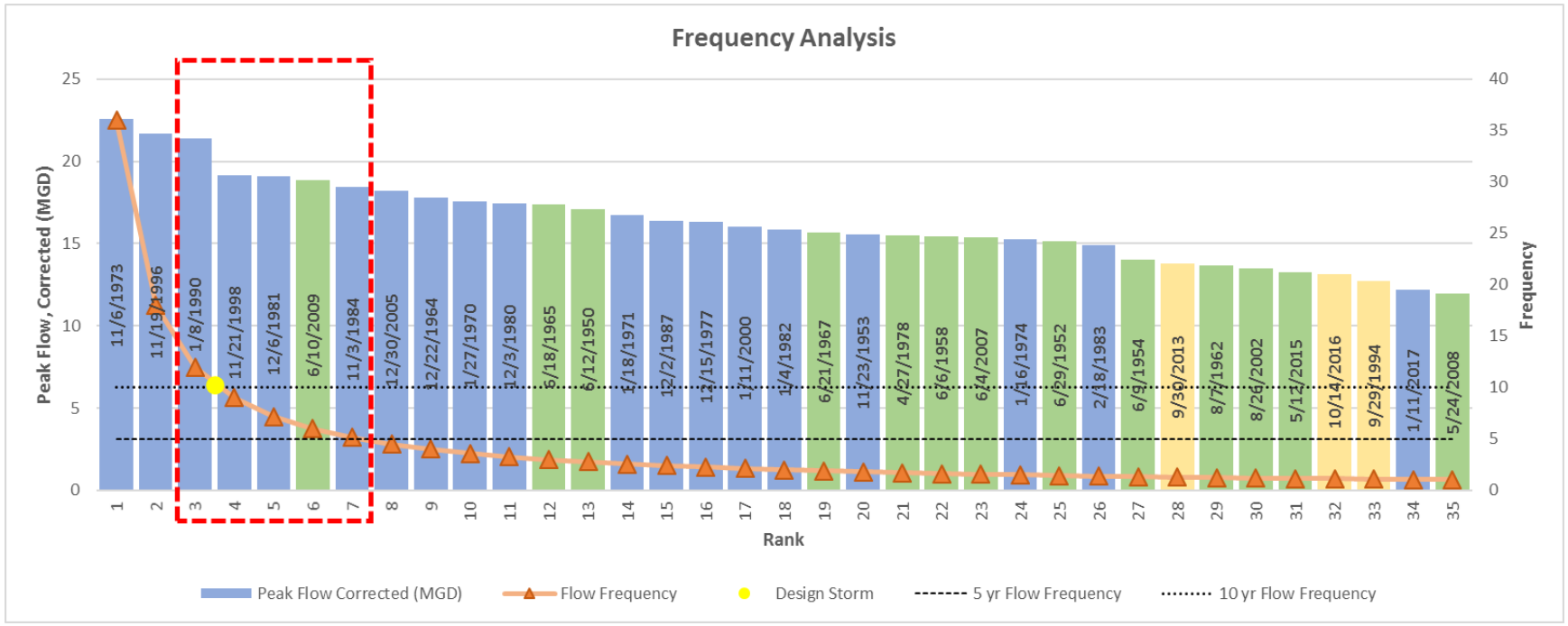
Figure 11
Loading (Average Dry Flow) Projections by Development Category and Phasing



A flow frequency analysis was performed utilizing historic precipitation data. Thirty-five high precipitation and seasonally variable historic rainfall events were simulated in the City's hydraulic model. These events were ranked from highest to lowest by downstream peak flow at the WRF. The recurrence interval (frequency) of each event was estimated to determine the risk of occurrence. Events that bracketed the 5-year (winter) to 10-year (summer) flow frequency were selected to represent a range of acceptable risk based on Oregon Department of Environmental Quality guidelines (Oregon Administrative Rule 340-041-0009). The peak flow rates established by the selected historic events were compared to the City's design storm to confirm a 1 in 10-year recurrence interval as shown in Figure 12. The City's design storm is characterized by a 24-hour rainfall depth of 1.3 inches and the National Resources Conservation Service (NRCS) Type II theoretical storm distribution.

Peak wet weather flows were developed utilizing the City's hydraulic model and applying the design storm event to calibrated wet weather unit hydrographs and associated sewershed areas for existing and future development within the City's UGB.

Figure 12
Flow Frequency Analysis and Design Storm Confirmation, Wet Weather



Design Criteria

The relevant design and performance criteria applied to improvement identification and sizing are consistent with the criteria applied in the CSMP. The criteria include: system surcharge, freeboard and overflow constraints, maximum and minimum velocity constraints, and lift station firm capacity as summarized in Table 21.

Table 21
Capacity Design Criteria

Category	Definition
During peak dry weather flows, depth/Diameter (d/D)	≤ 0.8
During peak wet weather flows, d/D	Existing Pipe: Covered under freeboard requirements New Pipe: < 1.0
During peak wet weather flows, maximum surcharge (freeboard from water surface to manhole rim)	Existing Pipe: Minimum 2.0 feet of freeboard system wide for unsealed gravity pipes. Manholes with < 2.0 feet from crown to rim will be identified and evaluated individually as exceptions or required improvements. New Pipe: No manhole surcharging, piping will be sized to convey peak wet weather flows under full pipe conditions.
Shallow manhole (crown of pipe to rim < 2.5 feet), during peak wet weather flows, maximum surcharge (freeboard from water surface to manhole rim)	Existing Pipe: Covered under peak wet weather requirement. New Pipe: No manhole surcharging, piping will be sized to convey peak wet weather flows under full pipe conditions.
Lift station firm capacity	Lift capacity to discharge the peak flow associated with the design wet weather event with largest unit out of service.
Maximum force main velocity	6 feet per second (fps) max under peak dry weather flows, 10 fps max under peak wet weather conditions with all pumps operating.

Capital Improvement Cost Assumptions

Unit cost rates used for the CIP are planning-level estimates and are consistent with the approach used in the CSMP. 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 2017 dollars based on *The Engineering News Record Construction Cost*

Index (ENR CCI) basis of 10,870 (December 2017).

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, deep rock blasting, utility conflicts and significant downtown disruptions, capital projects were given a contingency markup between 30- and 80-percent. Markups are presented in Table 22.

The actual project costs will likely vary from the estimates presented due to fluctuations in actual labor and material costs, competitive market conditions, site conditions, final project scope, implementation schedule, continuity of personnel, and other unforeseeable factors. Because of these factors, project feasibility, benefit-to-cost ratios, and funding must be carefully reviewed prior to making specific financial decisions or establishing project specific budgets.

Table 22
Unit Cost Markups

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

Capital Improvement Program

Improvement project descriptions and cost summaries are provided in Tables 23 through 24 and shown in Figure 13. Each project includes a unique identifier and a description of the improvement, including location reference, rough cost estimate (in December 2017 dollars), and timeframe for project implementation. Project implementation is subdivided into short-term (1 to 5-years), mid-term (6 to 10-years), and long-term (11 to 20-years). Where capacity related improvements are required for a lift station or gravity pipeline prior to a condition repair, the project timing is determined by the capacity constraint.

In addition to timeframe, projects are organized by the following categories.

1. Trunk Sewer and Interceptor Improvements – Larger diameter gravity trunk and interceptor projects to provide additional system capacity including the North and East Interceptors.

2. Southeast Lift Station Condition and Decommissioning Improvements– Lift Station decommissioning projects adjacent to the Southeast Interceptor. Several lift stations may require condition improvements prior to decommissioning.

3. South Lift Station Capacity and Condition Improvements impacting the Amethyst/Mahogany/3rd Street Trunk Sewer – Lift Station capacity and condition improvements adjacent to the trunk sewer. Lift station and trunk sewer improvement projects require coordination.

4. Other South and East Area Lift Station Condition Improvements – Condition improvements for lift stations that will not be decommissioned.

5. Central Area Lift Station Capacity and Condition Improvements – Lift Station capacity and condition improvements in the downtown core and directly impacting the Central Interceptor.

6. West Lift Station Capacity and Condition Improvements impacting the Newport Avenue Trunk Sewer – Lift Station capacity and condition improvements upstream of the trunk sewer. Lift stations require improvements to serve UGB expansion growth areas in the west.

7. North Lift Station Condition and Decommissioning Improvements- Lift Station decommissioning projects associated with construction of the North Interceptor. Several lift stations may require condition improvements prior to decommissioning.

8. Other North Area Lift Station Capacity and Condition Improvements – Capacity and condition improvements for lift stations that will not be decommissioned.

9. Programmatic Funding – These projects include annual or periodic funding for pipeline condition assessments, infrastructure repair and replacement program, local area improvements, flow monitoring, on-call hydraulic modeling services, and master planning.

10. Expansion Area Infrastructure – Collection system infrastructure including trunk sewers and one regional lift station to serve recent UGB expansion areas. Cost estimates exclude local sewers and sewer laterals. Projects are anticipated to be funded by developers.

Additional discussion is provided below to describe key projects from the above categories within the recommended implementation timeframes.

Short-Term Projects

In response to existing hydraulic deficiencies, planned near-term development, condition deficiencies and other operational issues identified by City Operations & Maintenance (O&M) staff, there are several major projects identified in the short term (1 to 5 years).

Projects completed or nearing construction between 2014 and 2017 are excluded from the CIP including:

1. Southeast Interceptor Phase 1 and Phase 1 Extension
2. Colorado Lift Station and Force main
3. North Area Improvements
4. Plant Interceptor Rehabilitation (upper segments)
5. Valhalla Sewer Relocation and Flushing

Major projects recommended in the 1 to 5-year timeframe include the following:

1. North Interceptor Phase 1
2. Southeast Interceptor Extension and Diversion
3. Southeast Lift Station Decommissioning
4. Drake Lift Station and Force main

North Interceptor Phase 1 – The project is located one half mile south of the existing Plant Interceptor, connecting to the existing interceptor near Pioneer Loop, and extending east to the WRF. The North Interceptor Phase 1 is required to alleviate capacity and condition related deficiencies in the existing interceptor allowing for continued development within the City's UGB. The project will require coordination with local irrigation districts to develop canal crossings.

Southeast Interceptor Extension and Diversion – The project extends the Southeast Interceptor west from Parrell Road and across Highway 97. The improvement will divert wastewater from the Mahogany/Amethyst trunk sewer and the Central Interceptor system

into the Southeast Interceptor allowing for continued development in the City central core. The diversion structure will allow split flow between the Central Interceptor and the Southeast Interceptor.

Southeast Lift Station Decommissioning – With the completion of the Southeast Interceptor, gravity sewer connections may be implemented to decommission up to 24 lift stations. Accelerated lift station decommissioning in many cases will eliminate potential condition improvements. Where lift station decommissioning is not feasible or cost-effective, condition improvements are recommended.

Drake Lift Station and Force main – Expansion of the Drake Lift Station and force main capacity will accommodate growth in the KorPine service area.

Short to Mid-Term Projects (Development-Driven)

Many projects are driven by development location and timing. The development-driven projects identified in the short- (0 to 5-years) to mid-term (6 to 10-years) are described below. These projects may be accelerated or delayed based on actual development and service trends. These projects include:

1. Amethyst/Mahogany/3rd Street Trunk
2. River Rim Lift Station
3. 8th to 15th Street Trunk
4. Newport Trunk, Shevlin Commons Lift Station, Shevlin Meadows Lift Station and Force main, and Renaissance Lift Station
5. Deschutes Business Lift Station
6. North Interceptor Phase 2
7. North Area Lift Station Decommissioning
8. North Interceptor Phase 3
9. Old Mill Lift Station and Force main
10. East Interceptor Phase 1

Amethyst/Mahogany/3rd Street Trunk and River Rim Lift Station – Expansion of the gravity trunk and the River Rim Lift Station pumping capacity are initially required for development in the River Rim upstream service area. Sizing of the trunk sewer includes planned future service for local septic to sewer conversions. The extent of the Amethyst/Mahogany/3rd Street Trunk sewer improvement is dependent on potential operational changes to implement variable frequency drives at six contributing lift stations.

8th to 15th Street Trunk – Trunk capacity improvements are driven by near-term development adjacent to 10th and 15th Street. Ultimate sizing of the improvement accommodates future infill development.

Newport Trunk, Shevlin Commons Lift Station, Shevlin Meadows Lift Station and Force main, and Renaissance Lift Station – Expansion of the gravity trunk and lift station capacities

are required for development of the West and Shevlin UGB expansion areas. The three lift stations share common force mains. The extent of the Newport Trunk sewer improvement is dependent on operation of the three lift stations and implementation of variable frequency drives.

Deschutes Business Lift Station – Expansion of the Deschutes Business Lift Station pumping capacity are driven by infill development in the service area adjacent to the existing lift station. Coordinate this improvement with service area and available capacity for Tuscany Pines Lift Station

North Interceptor Phase 2 and North Area Lift Station Decommissioning - Phase 2 extends the North Interceptor to Highway 97 and allows for north area development. The project will directly serve future development in Juniper Ridge and north UGB expansion areas (OB Riley and North Triangle). Once the interceptor is in place, gravity sewer connections can be implemented to decommission up to 7 lift stations. These projects will require coordination with local irrigation districts to develop canal crossings and may require conversion of open channel irrigation to piped conveyance prior to constructing the sewer crossing.

North Interceptor Phase 3 – Phase 3 extends the North Interceptor west to OB Riley Road and south to Glen Vista Road. The project is required to serve the OB Riley and North Triangle UGB expansion areas. Once in place, gravity sewer connections can be implemented to decommission an additional two lift stations. This project will require coordination with local irrigation districts to develop canal crossings and may require conversion of open channel irrigation to piped conveyance prior to constructing the sewer crossing.

Old Mill Lift Station and Force main – Expansion of the Old Mill Lift Station pumping, and force main capacity are driven by infill development in the service area adjacent to the existing lift station.

East Interceptor Phase 1 – The East Interceptor Phase 1 extends south from the North Interceptor Phase 1 on Hughes Road and Hamehook Road, to Butler Market Road. The project is driven initially by the Northeast Edge UGB expansion area. Ultimately the pipeline will serve infill, and UGB expansion areas in the southeast and south (Elbow, DSL, Thumb).

Mid to Long-Term Projects (Development-Driven)

The development-driven projects identified in the mid- (6 to 10-years) to long-term (11 to 20-years) are described below. These projects may be accelerated or delayed based on actual development and service trends. These projects include:

1. Drake Downstream Trunk
2. Central Interceptor
3. East Interceptor Phase 2

Drake Downstream Trunk – The gravity sewer between Drake Lift Station and the Central Interceptor requires upsizing to serve buildout densities for the KorPine development site. The project is recommended between the mid- and long-term timeframes (10-years) to accommodate phased development of the site in 5 to 15-years. To minimize traffic disruptions through busy commercial areas, an alternate improvement route from the Drake Lift Station to an improved 2nd Street Trunk may be considered.

Central Interceptor – The Central Interceptor requires upsizing to accommodate buildout densities in a combination of the West UGB expansion area, Shevlin UGB expansion area, Central Business District, KorPine Site, OSU Cascades, and Century Drive area. Similar to the Drake Trunk, the interceptor improvement is recommended between the mid- and long-term timeframes (10-years) to accommodate phased development in 5 to 15-years.

East Interceptor Phase 2 – Phase 2 extends the East Interceptor south on Hamby Road and west near Neff Road to connect with the Southeast Interceptor. A diversion structure is recommended to split flows between the Southeast Interceptor Phase 1 Extension on Neff Road and the East Interceptor. The project is driven by infill, and UGB expansion areas in the southeast and south.

Expansion Area Service

To serve many of the recent UGB expansion areas, projects are required to construct and extend trunk sewers. For the Elbow, a service area lift station and force main are required. These expansion projects exclude local collection piping and laterals. These projects are assumed to occur at the time of expansion area development and may be funded by developers.

1. Elbow Gravity Trunk
2. Elbow Lift Station and Force main
3. DSL Gravity Trunk
4. Thumb Gravity Trunks
5. West Gravity Trunks

The PFP excludes local pipelines and pumping services for expansion areas beyond the trunk sewers and regional lift station in the Elbow. The local sewer infrastructure projects are intended to be provided and funded by the developer of the neighborhood and are not included in the City's Capital Improvement Program.

Other Projects

Other short-, mid-, and long-term projects required to accommodate system growth and maintain system condition are described below:

1. Condition Related Lift Station Improvements
2. Condition Assessment, Sewer Flow Monitoring, Modeling, and Planning Projects

3. Pipeline Repair and Replacement Program
4. Local Area Improvements
5. Plant Interceptor Rehabilitation (lower portion)

Condition-Related Lift Station Improvements – The City's O&M Department rated the condition of City-owned area and regional lift stations determining that 26 lift stations require improvements in the short-term and 33 lift stations require improvements in the mid- to long-term.

Pipeline Repair and Replacement Program – The City plans for long-term stewardship of the collection system by dedicating funds to a systematic long-term collection system replacement program. This program consists of budgeting for the replacement of the collection system based on the useful life of infrastructure with in-kind replacement or rehabilitation methods, where applicable.

Local Area Improvements – City funds allocated for this improvement category provide sewer service to developed, unsewered areas of the community, and improve poorly performing areas of the existing collection system within the City limits.

Ongoing Condition Assessment, Sewer Flow Monitoring, Modeling and Planning Projects – These projects allow the City to continue improving information and data collection, condition databases, modeling, and planning related to ongoing management of the collection system. Dedicated funding has been identified for condition assessments, flow monitoring, hydraulic modeling and master planning. These projects will support plan updates and prioritization of collection system improvements beyond the 5-year timeframe.
Plant Interceptor Rehabilitation (lower segments) – Once the North Interceptor Phase 1 is constructed, the lower portions of the existing Plant Interceptor may be replaced or rehabilitated to address condition-related deficiencies. The combination of the existing Plant Interceptor and North Interceptor Phase 1 provide system redundancy and operational flexibility.

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
Trunk Sewers and Interceptors								
99A-r	Year 1 to 5	North Interceptor Phase 1	Pipeline Capacity and Condition	New interceptor located one half mile south of the existing Plant Interceptor, connecting to the existing interceptor near Pioneer Loop, and extending east to the WRF.	The North Interceptor Phase 1 is required to alleviate capacity and condition related deficiencies in the Plant Interceptor in the near-term. This project will require coordination with local irrigation districts to develop canal crossings. Coordinate with ODOT for timing and alignment of the North Corridor Highway project.	up to 60-inch	9,700 LF	$17,900,000
60C-r	Year 1 to 5	Southeast Interceptor Extension	Pipeline Capacity and Development	New piping to extend the Southeast Interceptor west from Parrell Road and across Highway 97. A diversion structure will allow split flow between the Central Interceptor and the Southeast Interceptor.	The improvement will divert wastewater from the Mahogany/Amethyst trunk sewer and the Central Interceptor system into the Southeast Interceptor allowing for continued development in the City central core. Coordinate with improvement 22-r. Routing options may allow for reduced collective improvements between 60C-r and 22-r.	30-inch	3,600 LF	$4,000,000
22-r	Year 1 to 5	Amethyst/Mahogany/ 3rd Street Trunk Sewer	Pipeline Capacity and Development	Upsize existing trunk sewer (or construct parallel sewer) between CMH001647 and CMH001653 on Amethyst and Mahogany Streets; CMH001631 and CMH001636 near Granite Drive, Driftwood Lane, and Crystal Lane; and, CMH009797 and CMH003638 on 3rd Street.	Project required for development in the River Rim service area, infill development, Thumb UGB expansion area, and septic to sewer conversions. Coordinate with improvements 60C-r, 42, 29, 70-r, 28-r, 125, and 114. Routing options may allow for reduced collective improvements between 60C-r and 22-r. VFDs at applicable lift stations reduce potential impact to trunk sewer.	up to 30-inch	6,000 LF	$3,520,000
200-n	Year 1 to 5	Newport Ave Trunk Sewer	Pipeline Capacity and Development	Upsize existing trunk sewer (or construct parallel sewer) between CMH004178 and CMH002539, and CMH008750 and CMH008747 on Shevlin Park Road.	Project required for West and Shevlin UGB expansion development. Coordinate with improvements 111, 123, 112A-r, and 112B-r. VFDs at applicable lift stations reduce potential impact to trunk sewer.	36-inch	1,200 LF	$800,000
202-n	Year 1 to 5	8th to 15th Street Trunk Sewer	Pipeline Capacity and Development	Upsize existing trunk sewer (or construct parallel sewer) between CMH002339 and CMH008036 between 8th and 15th Streets.	Project required for development adjacent to trunk sewer on 10th and 15th Streets.	18-inch	10,000 LF	$6,875,000
99B-r	Year 6 to 10	North Interceptor Phase 2	Pipeline Capacity and Development	Extend the North Interceptor from phase 1 to Highway 97.	Project required for north area development including Juniper Ridge, infill development, North Triangle, and OB Riley. Coordinate with North Area Lift Station decommissioning (100A, 100B, 101A, 101B, 102A, 102B, 103A, 103B, 104A, 104B, 105A, 105B, 106A, 106B). This project will require coordination with local irrigation districts to develop piped canal crossings. Coordinate with ODOT for timing and alignment of the North Corridor Highway project.	up to 60-inch	16,600 LF	$28,900,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
99C-r	Year 6 to 10	North Interceptor Phase 3	Pipeline Capacity and Development	Extend the North Interceptor from phase 2 at Highway 97 west to OB Riley Road and south to Glen Vista Road.	Project required for north area development North Triangle, and OB Riley. Coordinate with North Area Lift Station decommissioning (116A-r, 116B-r, 124A-r, 124B-r). This project will require coordination with local irrigation districts to develop piped canal crossings. Coordinate with ODOT for timing and alignment of the North Corridor Highway project.	24-inch	14,200 LF	$11,300,000
201-n	Year 6 to 10	Drake Trunk Sewer	Pipeline Capacity and Development	Upsize existing trunk sewer (or construct parallel sewer) between CMH0083059 and CMH003482 near Broadway Street, Brooks Street, and Wall Street.	Project required for buildout of KorPine. To minimize traffic disruptions, an alternate route from the Drake Lift Station to an improved 2nd Street Trunk may be considered. Coordinate with improvements 36A-r and 36B-r. The lift station improvements may precede the gravity trunk improvements if VFDs are utilized to minimize gravity trunk impacts.	up to 48-inch	5,000 LF	$3,200,000
107-r	Year 6 to 10	Central Interceptor	Pipeline Capacity and Development	Upsize existing trunk sewer (or construct parallel sewer) between CMH003482 and CMH000319 on or near Olney Street, 4th Street, 5th Street, Studio Road, and Butler Market Road	Project required for buildout of the West, Shevlin, Central Business District, KorPine, OSU Cascades, and Century Drive.	up to 48-inch	10,000 LF	$11,680,000
60A1-r	Year 11 to 20	East Interceptor Phase 1	Pipeline Capacity and Development	New interceptor extending south from the North Interceptor Phase 1 on Hughes Road and Hamehook Road, to Butler Market Road.	Project required for development in the Northeast Edge. Ultimately the interceptor will serve all of Southeast Bend.	36-inch	8,600 LF	$14,300,000
60A2-r	Year 11 to 20	East Interceptor Phase 2	Pipeline Capacity and Development	Extend the East Interceptor from Phase 1, south on Hamby Road and west near Neff Road to connect to the Southeast Interceptor. A diversion structure will split flow between the Southeast Interceptor Phase 1 Extension on Neff Road and the East Interceptor.	Project required for buildout growth in Southeast Bend.	30-inch	14,500 LF	$15,600,000
Southeast Lift Stations Condition and Decommissioning								
15	Year 1 to 5	Murphy Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Project in progress	-	1 EA	$33,000
17A	Year 1 to 5	Ridgewater #1 Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe from Ridgewater #1 Lift Station to the intersection of Ridgewater Loop and Ferguson Road, connecting to the SEI.	Coordinate with 17B, Project in progress	8 to 10-inch	100 LF	$16,000
17B	Year 1 to 5	Ridgewater #1 Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 17A, Project in progress	-	1 EA	$33,000
18A	Year 1 to 5	Shadow Glen Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe from Shadow Glen Lift Station west, cross-country to 15th Street connecting to the SEI northeast of Golden Gate Place and 15th Street intersection.	Coordinate with 18B, Project in progress	8 to 10-inch	100 LF	$37,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
18B	Year 1 to 5	Shadow Glen Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 18A, Project in progress	-	1 EA	$33,000
20	Year 1 to 5	Sun Meadow Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Project in progress	-	1 EA	$33,000
33	Year 1 to 5	Crown Villa #1 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, discharge piping and electrical panel.	Eliminate improvement if lift station is decommissioned in near-term (see improvement 13A and 13B).	-	1 EA	$116,000
13A	Year 1 to 5	Crown Villa #1 Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe from Crown Villa #1 Lift Station cross-country east to Brosterhous Road, connecting to existing gravity pipe south of Brosterhous Road and Murphy Road intersection.	Coordinate with 13B	8 to 10-inch	500 LF	$119,000
13B	Year 1 to 5	Crown Villa #1 Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 13A	-	1 EA	$33,000
34	Year 1 to 5	Crown Villa #2 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, discharge piping and electrical panel and control panel.	Eliminate improvement if lift station is decommissioned in near-term (see improvement 14A and 14B).	-	1 EA	$116,000
14A	Year 1 to 5	Crown Villa #2 Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along a private road between Crown Villa #2 Lift Station and 530 feet east to Brosterhous Rd, connecting to existing gravity pipe south of Brosterhous Road and Murphy Road intersection.	Coordinate with 14B	8 to 10-inch	600 LF	$141,000
14B	Year 1 to 5	Crown Villa #2 Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 14A	-	1 EA	$33,000
43	Year 1 to 5	Quail Ridge #1 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, discharge piping and electrical panel.	Eliminate improvement if lift station is decommissioned in near-term (see improvement 90A and 90B).	-	1 EA	$174,000
90A	Year 1 to 5	Quail Ridge #1 Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe going northeast approximately 100 feet cross-country from Quail Ridge #1 Lift Station to Brosterhous Road connecting to existing pipe northeast of Brosterhous and Windsor Drive intersection.	Coordinate with 90B	8 to 10-inch	100 LF	$27,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
90B	Year 1 to 5	Quail Ridge #1 Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 90A	-	1 EA	$33,000
44	Year 1 to 5	Quail Ridge #2 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, discharge piping and electrical panel.	Eliminate improvement if lift station is decommissioned in near-term (see improvement 16A and 16B).	-	1 EA	$174,000
16A	Year 1 to 5	Quail Ridge #2 Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New sewer pipe from Quail Ridge #2 Lift Station to Brosterhous Road (cross-country), connecting to existing gravity pipe northwest of Brosterhous Road and Windsor Drive intersection.	Coordinate with 16B	8 to 10-inch	100 LF	$17,000
16B	Year 1 to 5	Quail Ridge #2 Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 16A	-	1 EA	$33,000
50	Year 1 to 5	The Pines #5 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: station piping and plumbing.	Eliminate improvement if lift station is decommissioned in near-term (see improvement 94A and 94B).	-	1 EA	$116,000
94A	Year 1 to 5	The Pines #5 Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe going southwest cross-country from Pines #5 Lift Station to Brosterhous Road, connecting to existing pipe northwest of Brosterhous Road and Windsor Drive intersection.	Coordinate with 94B	8 to 10-inch	700 LF	$169,000
94B	Year 1 to 5	The Pines #5 Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 94A	-	1 EA	$33,000
51	Year 1 to 5	The Pines #6 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: station piping and plumbing.	Eliminate improvement if lift station is decommissioned in near-term (see improvement 95A and 95B).	-	1 EA	$116,000
95A	Year 1 to 5	The Pines #6 Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe going southwest cross-country from Pines #6 Lift Station to Brosterhous Road, connecting to existing pipe south of Murphy Road and Brosterhous Road intersection.	Coordinate with 95B	8 to 10-inch	1,500 LF	$374,000
95B	Year 1 to 5	The Pines #6 Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 95A	-	1 EA	$33,000
52	Year 1 to 5	The Pines #7 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: station piping and plumbing.	Eliminate improvement if lift station is decommissioned in near-term (see improvement 96A and 96B).	-	1 EA	$116,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
96A	Year 1 to 5	The Pines #7 Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe going southwest, cross-country from Pines #7 Lift Station to Brosterhous Road, connecting to existing pipe northwest of Brosterhous Road and Windsor Drive intersection.	Coordinate with 96B	8 to 10-inch	400 LF	$83,000
96B	Year 1 to 5	The Pines #7 Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 96A	-	1 EA	$33,000
6A-r	Year 1 to 5	Tri Peaks Decommission - Southern Gravity Diversion	Gravity Pipe, LS Decommission	New pipeline from Tri Peaks Lift Station to sewer on Brosterhous Rd near Jacklight Ln. Portions of project may be constructed by developers. Coordinate with developer plans for interim Stone Creek/Anderson Ranch lift station.	Coordinate with 6B-r	8 to 10-inch	4,000 LF	$1,848,000
6B-r	Year 1 to 5	Tri Peaks Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 6A-r	-	1 EA	$33,000
32	Year 1 to 5	Camden Park Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, rail system and electrical panel.	Eliminate improvement if lift station is decommissioned in near-term (see improvement 62A and 62B).	-	1 EA	$174,000
62A	Year 1 to 5	Camden Park Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe from Camden Park Lift Station along Ferguson Road, connecting to New gravity pipe (Project 67A) east of Ferguson Road and Sage Creek Drive intersection.	Coordinate with 62B	8 to 10-inch	1,100 LF	$1,296,000
62B	Year 1 to 5	Camden Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 62A	-	1 EA	$33,000
63A	Year 1 to 5	Desert Skies Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe from Desert Skies Lift Station along Daily Estates Drive to Clairaway Avenue, then along Clairaway Avenue to 27th Street, connecting to the SEI	Coordinate with 63B	8 to 10-inch	900 LF	$906,000
63B	Year 1 to 5	Desert Skies Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 63A	-	1 EA	$33,000
64A	Year 1 to 5	Forum Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe from Forum Lift Station along Forum Drive connecting to SEI pipeline at Forum Drive and 27th Street intersection.	Coordinate with 64B	8 to 10-inch	800 LF	$332,000
64B	Year 1 to 5	Forum Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 64A	-	1 EA	$33,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
67A	Year 1 to 5	Ridgewater #2 Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Ferguson Road between Ladera Road and King Solomon Lane, connecting to SEI pipeline.	Coordinate with 67B	8 to 10-inch	1,000 LF	$994,000
67B	Year 1 to 5	Ridgewater #2 Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 67A	-	1 EA	$33,000
89A	Year 1 to 5	Darnell Estates Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Darla Place between Darby Court and Darnel Avenue, then along Darnel Avenue to 27th Street, connecting to SEI pipeline.	Coordinate with 89B	8 to 10-inch	700 LF	$263,000
89B	Year 1 to 5	Darnell Estates Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 89A	-	1 EA	$33,000
92A	Year 1 to 5	Stone Haven Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Aberdeen Drive between approximately 200 feet south of Silver Sage and Broadmoor Way, then along Broadmoor Way to Murphy Road, connecting to SEI.	Coordinate with 92B	10 to 12-inch	700 LF	$279,000
92B	Year 1 to 5	Stone Haven Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 92A	-	1 EA	$33,000
97A	Year 1 to 5	The Shire Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Benham Road between south of Knightsbridge Place and Silver Sage Street, then along Silver Sage Street to Aberdeen Drive, then along Aberdeen Drive, connecting to new 10-inch pipe south of Silver Sage Street and Aberdeen Drive intersection.	Coordinate with 97B	8 to 10-inch	2,600 LF	$2,034,000
97B	Year 1 to 5	The Shire Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 97A	-	1 EA	$33,000
39	Year 1 to 5	Nottingham #1 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: corroded pumps, piping and rail system.	Eliminate improvement if lift station is decommissioned in near-term (see improvement 65A and 65B).	-	1 EA	$174,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
65A	Year 1 to 5	Nottingham #1 Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe from upstream of Nottingham #1 Lift Station south, cross-country for approximately 100 feet, then cross-country east to Robin Hood Lane, then along Robin Hood Lane northeast approximately 150 feet, then cross-country northeast 15th Street, then along 15th Street to Desert Woods Drive, then along Desert Woods Drive to Orion Drive, connecting to SEI pipeline.	Coordinate with 65B	8 to 10-inch	4,800 LF	$1,249,000
65B	Year 1 to 5	Nottingham #1 Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 65A	-	1 EA	$33,000
40	Year 1 to 5	Nottingham #2 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: wet well and discharge piping.	Eliminate improvement if lift station is decommissioned in near-term (see improvement 66A and 66B).	-	1 EA	$174,000
66A	Year 1 to 5	Nottingham #2 Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe from Nottingham #2 Lift Station east, cross-country to Sherwood Forest Drive, then along Sherwood Forest Drive southeast approximately 400 feet, then cross-country southeast to 15th Street, connecting to SEI pipeline.	Coordinate with 66B	12 to 15-inch	1,600 LF	$478,000
66B	Year 1 to 5	Nottingham #2 Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 66A	-	1 EA	$33,000
19A	Year 6 to 10	South Village Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe from South Village Lift Station to Murphy Road, connecting to SEI northwest of Murphy Road and Parrell Road intersection.	Coordinate with 19B	8 to 10-inch	300 LF	$74,000
19B	Year 6 to 10	South Village Lift Station Decommission	Lift Station Decommission	The decommissioning of South Village Lift Station includes the removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 19A	-	1 EA	$33,000
91A	Year 6 to 10	Simplicity Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Hollis Lane between east of Lincoln Lane and 15th Street, then along 15th Street to Desert Woods Drive.	Coordinate with 91B	8 to 10-inch	1,600 LF	$411,000
91B	Year 6 to 10	Simplicity Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 91A	-	1 EA	$33,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
88A	Year 11 to 20	Blue Ridge Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Knott Road between Blue Ridge Lane and Country Club Drive, then along Country Club Drive to south of Murphy Road, connecting to SEI pipeline south of the intersection.	Coordinate with 88B	8 to 10-inch	6,800 LF	$1,979,000
88B	Year 11 to 20	Blue Ridge Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 88A	-	1 EA	$33,000
South Lift Stations Impacting Amethyst/Mahogany Trunk Sewer								
42	Year 1 to 5	Poplar Park Lift Station Capacity and Condition	Lift Station Capacity and Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors. Implement VFDs to minimize impacts to downstream Amethyst/Mahogany trunk sewer.	Consider VFD installation in 1 to 5-year timeframe and coordinate with improvements to Amethyst/Mahogany trunk sewer (improvement 22-r). Improve sink hole issue.	-	1 EA	$231,000
29	Year 1 to 5	River Rim Lift Station Hydraulic Upgrade	Lift Station Capacity	Project includes new pumps, VFDs, piping, electrical and control equipment, standby generator for back-up power, odor control equipment, liquid level monitoring, pressure monitoring, flow monitoring, bypass pumping port and telemetry equipment.	Consider VFD installation in 1 to 5-year timeframe and coordinate with improvements to Amethyst/Mahogany trunk sewer (improvement 22-r). Coordinate pump sizing with improvement 68.	-	400 GPM	$1,800,000
68	Year 6 to 10	River Rim Force Main	Force Main Capacity	Upsize force main along Water Front Court from River Rim Lift Station to Charleswood Lane, then along Charleswood Lane to Creek Stone Loop, then along Creek Stone Loop to River Rim Drive, then along River Rim Drive to Brookswood Boulevard, connecting to Amethyst/Mahogany trunk sewer.	Coordinate force main sizing with pump selection for improvement 29.	6-inch	3,400 LF	$1,275,000
70-r	Year 6 to 10	Aspen Ridge Lift Station Capacity and Condition	Lift Station Capacity and Condition	Rehabilitation and, where required, replacement of deteriorating lift station components. Implement VFDs to minimize impacts to downstream Amethyst/Mahogany trunk sewer.	Consider VFD installation in 1 to 5-year timeframe and coordinate with improvements to Amethyst/Mahogany trunk sewer (improvement 22-r).	-	1 EA	$399,000
28-r	Year 6 to 10	River Canyon #2 Lift Station Capacity and Condition	Lift Station Capacity and Condition	Rehabilitation and, where required, replacement of deteriorating lift station components. Implement VFDs to minimize impacts to downstream Amethyst/Mahogany trunk sewer.	Consider VFD installation in 1 to 5-year timeframe and coordinate with improvements to Amethyst/Mahogany trunk sewer (improvement 22-r).	-	1 EA	$399,000
125	Year 11 to 20	River Canyon #1 Lift Station Capacity and Condition	Lift Station Capacity and Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	Consider VFD installation in 1 to 5-year timeframe and coordinate with improvements to Amethyst/Mahogany trunk sewer (improvement 22-r).	-	1 EA	$399,000
114	Year 11 to 20	Deschutes River Crossing Lift Station Capacity and Condition	Lift Station Capacity and Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	Consider VFD installation in 1 to 5-year timeframe and coordinate with improvements to Amethyst/Mahogany trunk sewer (improvement 22-r).	-	1 EA	$399,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
Other South and East Lift Station Capacity and Condition Improvements								
45	Year 1 to 5	Renwick Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: vacuum priming system and small wet well.	-	-	1 EA	$399,000
76	Year 6 to 10	Tuscany Pines Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.	Portions of this project have been completed.	-	1 EA	$399,000
79	Year 6 to 10	Hollow Pines #2 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and VFDs.	-	-	1 EA	$399,000
82	Year 6 to 10	Widgi Creek Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, rail system and electrical components.	Portions of this project have been completed.	-	1 EA	$399,000
93-r	Year 11 to 20	Summit Park Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components.	-	-	1 EA	$399,000
110-r	Year 11 to 20	Pheasant Run Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components.	-	-	1 EA	$399,000
113	Year 11 to 20	Bachelor Village Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	-	-	1 EA	$399,000
115	Year 11 to 20	Foxborough Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	Reconfigure connection to expansion tank.	-	1 EA	$399,000
117	Year 11 to 20	Hollow Pines #1 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	-	-	1 EA	$399,000
121	Year 11 to 20	Orion Greens Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	-	-	1 EA	$399,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
122	Year 11 to 20	Pine Ridge Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.	-	-	1 EA	$399,000
128	Year 11 to 20	Sunrise #1 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: rail system.	-	-	1 EA	$399,000
129	Year 11 to 20	Touchmark Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.	-	-	1 EA	$399,000
132	Year 11 to 20	Woodriver Village Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	-	-	1 EA	$399,000
Central Area Lift Station Condition and Capacity Improvements								
21-r	Year 1 to 5	Riverhouse Lift Station Capacity	Lift Station Capacity and Condition	Downsize of mechanical pumping and/or electrical components to decrease hydraulic capacity. Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: wet well, pumps, motors and electrical equipment. Some portion of this project may be privately funded.	-	-	20 GPM	$399,000
36A-r	Year 1 to 5	Drake Lift Station Capacity and Condition	Lift Station Capacity and Condition	Replacement of existing facility with a new lift station to address condition issues, future capacity, and site constraints. Project includes pumps, VFDs, piping, electrical and control equipment, verification of on-site standby generator capacity, odor control equipment, wet or dry well, liquid level monitoring, pressure monitoring, flow monitoring, bypass pumping port and telemetry equipment.	Additional capacity required for KorPine development. Coordinate with 36B-r.	-	1,200 GPM	$2,730,000
36B-r	Year 1 to 5	Drake Lift Station Force main	Force main Capacity	Upsize existing force main near the intersection of Riverside Blvd and Congress Street.	Additional capacity required for KorPine development. Coordinate with 36A-r	8-inch	600 LF	$347,000
71A-r	Year 1 to 5	Old Mill Lift Station Hydraulic Upgrade	Lift Station Capacity	Upgrade of mechanical pumping and/or electrical components to accommodate increased hydraulic capacity requirements. VFS required to minimize downstream impacts in Central Interceptor.	Additional capacity required for infill development. Timing may vary based on development permitting.	-	1,000 GPM	$2,410,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
71B-r	Year 1 to 5	Old Mill Lift Station Force main	Force main Capacity	Upsize existing force main near Bluff Drive and Bond Street.	Additional capacity required for infill development. Timing may vary based on development permitting.	8-inch	1,600 LF	$600,000
27	Year 1 to 5	Pioneer Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps, access to lift station.	-	-	1 EA	$399,000
41	Year 1 to 5	Pacific Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: access to lift station pumps and piping.	Potentially return to private ownership.	-	1 EA	$399,000
53	Year 1 to 5	Underwood Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: vacuum priming system and small wet well.	-	-	1 EA	$399,000
78	Year 6 to 10	Glenshire Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and VFD.	-	-	1 EA	$399,000
81	Year 6 to 10	Rivers Edge Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.	-	-	1 EA	$399,000
73-r	Year 11 to 20	Sawyer Park Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components.	-	-	1 EA	$399,000
118	Year 11 to 20	Linster Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	-	-	1 EA	$399,000
126	Year 11 to 20	Riviera Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	-	-	1 EA	$399,000
130	Year 11 to 20	Tumalo Heights Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.	Portions of this project have been completed.	-	1 EA	$399,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
131	Year 11 to 20	Westside Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition. This lift station is the largest in the system and due to site constraints and size, it will be expensive to upgrade.	-	-	1 EA	$1,155,000
West Area Lift Stations Impacting Newport Ave Trunk Sewer								
31	Year 1 to 5	Awbrey Glen Lift Station Condition	Lift Station Condition	Backup power generator.	-	-	1 EA	$161,000
111	Year 1 to 5	Shevlin Commons Lift Station Hydraulic Upgrade	Lift Station Capacity	Replacement or upgrade of existing facility to accommodate upgrades in capacity. Project includes new pumps, VFDs, piping, electrical and control equipment, standby generator for back-up power, odor control equipment, wet or dry well, liquid level monitoring, pressure monitoring, flow monitoring, bypass pumping port and telemetry equipment.	Coordinate with improvements 123, 112A-r, and 112B-r. Improvement required for West UGB expansion development.	-	120 GPM	$839,000
123	Year 1 to 5	Renaissance Lift Station Lift Station Hydraulic Upgrade	Lift Station Capacity	Upgrade of mechanical pumping and/or electrical components to accommodate increased hydraulic capacity requirements. Implement VFDs to minimize impacts to downstream Newport trunk sewer.	Coordinate with improvements 111, 112A-r, and 112B-r. Improvement required for West UGB expansion development.	-	70 GPM	$399,000
112A-r	Year 1 to 5	Shevlin Meadows Lift Station Hydraulic Upgrade	Lift Station Capacity	Upgrade of mechanical pumping and/or electrical components to accommodate increased hydraulic capacity requirements. Implement VFDs to minimize impacts to downstream Newport trunk sewer.	Coordinate with improvements 111, 123, and 112B-r. Improvement required for West UGB expansion development.	-	190 GPM	$760,000
112B-r	Year 1 to 5	Shevlin Meadows Lift Station Force main	Force main Capacity	Upsize existing force main (Shevlin Park Rd segments)	Coordinate with improvements 111, 123, and 112A-r. Improvement required for West UGB expansion development.	6-inch	600 LF	$300,000
119	Year 11 to 20	Main Fire Station Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	-	-	1 EA	$116,000
North Area Lift Stations Condition and Decommissioning								
100A	Year 6 to 10	Boyd Acres Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Stacy Lane, cross-country from Nicolette Drive northwest to Vogt Road and Hunters Circle intersection, then cross-country northeast to Stacy Lane, then along Stacy Lane, connecting to new pipe south of Cooley Road.	Coordinate with 100B. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required. This project may require coordination with local irrigation districts to develop piped canal crossings.	8 to 10-inch	1,100 LF	$852,000
100B	Year 6 to 10	Boyd Acres Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 100A. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required.	-	1 EA	$33,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
101A	Year 6 to 10	Highland Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe going south, cross-country from Highland Lift Station to Cooley Road, then along Cooley Road to Hunters Circle, connecting to North Interceptor.	Coordinate with 101B. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required. This project may require coordination with local irrigation districts to develop piped canal crossings.	8 to 10-inch	3,600 LF	$1,615,000
101B	Year 6 to 10	Highland Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 101A. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required.	-	1 EA	$33,000
102A	Year 6 to 10	Holiday Inn Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Highway 97 from Holiday Inn Lift Station for approximately 200-feet, then cross-country going east to Hunters Circle, connecting to North Interceptor at Hunters Circle and Joseph Way intersection.	Coordinate with 102B. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required. This project may require coordination with local irrigation districts to develop piped canal crossings.	8 to 10-inch	800 LF	$605,000
102B	Year 6 to 10	Holiday Inn Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 102A. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required.	-	1 EA	$33,000
103A	Year 6 to 10	Juniper Ridge Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe going east approximately 2,400 feet cross-country from Juniper Ridge Lift Station, connecting to North Interceptor.	Coordinate with 103B. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required. This project may require coordination with local irrigation districts to develop piped canal crossings.	10 to 12-inch	2,500 LF	$1,656,000
103B	Year 6 to 10	Juniper Ridge Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 103A. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required.	-	1 EA	$33,000
104A	Year 6 to 10	North Pointe Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Hunters Circle from upstream of North Pointe Lift Station to North Interceptor.	Coordinate with 104B. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required. This project may require coordination with local irrigation districts to develop piped canal crossings.	8 to 10-inch	100 LF	$22,000
104B	Year 6 to 10	North Pointe Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 104A. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required.	-	1 EA	$33,000
105A	Year 6 to 10	North Wind Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Stacy Lane between Overton Place and Cooley Road, then along Cooley Road to Hunters Circle, connecting to North Interceptor.	Coordinate with 105B. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required. This project may require coordination with local irrigation districts to develop piped canal crossings.	8 to 10-inch	700 LF	$739,000
105B	Year 6 to 10	North Wind Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 105A. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required.	-	1 EA	$33,000
106A	Year 6 to 10	Phoenix Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Ranch Village Drive from Phoenix Lift Station to Cooley Road, then east along Cooley Road, connecting to existing 8-inch pipe west of Cooley Road and 18th Street intersection.	Coordinate with 106B. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required. This project may require coordination with local irrigation districts to develop piped canal crossings.	8 to 10-inch	1,800 LF	$692,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
106B	Year 6 to 10	Phoenix Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 106A. North Interceptor Phases 1 and 2 (improvements 99A-r and 99B-r) required.	-	1 EA	$33,000
116	Year 11 to 20	Glen Vista Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	Eliminate improvement if lift station is decommissioned (see improvement 116A-r and 116B-r).	-	1 EA	$399,000
116A-r	Year 11 to 20	Glen Vista Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Glen Vista and OB Riley Rd connecting to North Interceptor.	Coordinate with 116B-r. North Interceptor Phases 1, 2, and 3 (improvements 99A-r, 99B-r, and 99C-r) required. This project may require coordination with local irrigation districts to develop piped canal crossings.	8 to 10-inch	700 LF	$405,000
116B-r	Year 11 to 20	Glen Vista Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 116A-r. North Interceptor Phases 1, 2, and 3 (improvements 99A-r, 99B-r, and 99C-r) required.	-	1 EA	$33,000
124	Year 11 to 20	Rim Rock Riders Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.	Eliminate improvement if lift station is decommissioned (see improvement 124A-r and 124B-r).	-	1 EA	$399,000
124A-r	Year 11 to 20	Rim Rock Riders Lift Station Decommission - Gravity Sewer Diversion	Gravity Pipe, LS Decommission	New gravity pipe along Roper Ln and OB Riley Rd connecting to North Interceptor.	Coordinate with 124B-r. North Interceptor Phases 1, 2, and 3 (improvements 99A-r, 99B-r, and 99C-r) required. This project may require coordination with local irrigation districts to develop piped canal crossings.	8 to 10-inch	1,200 LF	$693,000
124B-r	Year 11 to 20	Rim Rock Riders Lift Station Decommission	Lift Station Decommission	Removal of the existing lift station facility and all associated appurtenances with the exception of the force main, which will be abandoned in place.	Coordinate with 124A-r. North Interceptor Phases 1, 2, and 3 (improvements 99A-r, 99B-r, and 99C-r) required.	-	1 EA	$33,000
Other North Area Lift Station Capacity and Condition Improvements								
35	Year 1 to 5	Deschutes Business Lift Station Capacity and Condition	Lift Station Capacity and Condition	Replacement of lift station and components where O&M Department condition assessment indicated poor condition: pumps, VFDs, discharge piping, corroded wet well, corroded discharge piping and corroded valve pit. Coordinate improvement with other lift stations using common force mains.	Coordinate this improvement with available capacity and recent or planned improvement to Tuscany Pines Lift Station.	-	140 GPM	$610,000
37	Year 1 to 5	Empire Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and variable frequency drives.	- Work performed recently and project may be complete.	-	1 EA	$116,000
38	Year 1 to 5	Empire Village Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and investigation into air locking.	-	-	1 EA	$116,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
46	Year 1 to 5	Rimrock #1 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: small wet well. Proximity to river makes this lift station a significant liability.	-	-	1 EA	$116,000
47	Year 1 to 5	Rimrock #2 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: small wet well. Proximity to river makes this lift station a significant liability.	-	-	1 EA	$116,000
48	Year 1 to 5	Rimrock #4 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: small wet well. Proximity to river makes this lift station a significant liability.	-	-	1 EA	$116,000
49	Year 1 to 5	Rimrock #5 Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: small wet well. Proximity to river makes this lift station a significant liability.	-	-	1 EA	$116,000
26	Year 1 to 5	Canal View Lift Station Condition	Lift Station Condition	Further assessment required to address sink hole and lift station operational risks.	-	-	1 EA	$174,000
77	Year 6 to 10	Enchant on Deschutes Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.	-	-	1 EA	$399,000
80	Year 6 to 10	Majestic Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: rail system.	Verify expansion tank, line realignment.	-	1 EA	$399,000
72-r	Year 11 to 20	Quail Crossing Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components.	-	-	1 EA	$399,000
120	Year 11 to 20	N. Fire Station Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	-	-	1 EA	$116,000
127	Year 11 to 20	Service Station Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition: pumps and motors.	-	-	1 EA	$399,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
133	Year 11 to 20	Wyndemere Lift Station Condition	Lift Station Condition	Rehabilitation and, where required, replacement of deteriorating lift station components where O&M Department condition assessment indicated poor condition.	-	-	1 EA	$399,000
Programmatic Funding								
8	Year 1 to 5	Large Gravity Pipe Condition Assessment Program - Year 1 to 5	Miscellaneous Project	Continue program to inspect the condition of existing gravity trunk collection system, grade the trunk system components, evaluate rehabilitation options and recommend the most effective solution. This type of inspection requires continued investment in equipment for the O&M Department. Funding includes consultant assistance. This project excludes condition assessment of the Plant Interceptor or Inverted Siphon. City Project ID SW10AA.	-	-	-	$1,155,000
B	Year 1 to 5	Local Area Improvements - Year 1 to 5	Fund Local Area Improvements	Budget to develop a plan for implementing local area sewer improvements in the system within the City limits. These areas include currently unsewered customers (septic) and areas that have poorly performing systems. Specific details, including pipe alignments, pipe sizes, service areas, and timetable for construction have not yet been determined.	-	-	-	$5,775,000
D	Year 1 to 5	Ongoing Repair and Replacement - Year 1 to 5	Fund Ongoing Repair & Replacement	Fund for implementing long-term ongoing repair and replacement budget to address condition-related projects in the future. Specific details, including alignment, pipe sizes have not yet been determined.	-	-	-	$11,181,000
9	Year 1 to 5	Flow Monitoring Program - Year 1 to 5	Miscellaneous Project	Continue operations and maintenance of permanent and temporary flow monitoring equipment.	Utilize data for model calibration and flow analysis for capital projects.	-	-	$289,000
11	Year 1 to 5	On-Call Hydraulic Modeling Services - Year 1 to 5	Miscellaneous Project	Engineering services contract, tailored to meet the City's future need of updating the sewer model, adjusting calibration, or answering specific system operational questions. City Project ID SW111CA.	-	-	-	$578,000
54	Year 1 to 5	Odor Control Master Plan	Miscellaneous Project	Collection System Odor Master Plan will include study, documentation, and evaluation of the collection system odors issues as well as recommend improvements and prepare a capital improvement plan.	-	-	-	$1,155,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
86	Year 6 to 10	Large Gravity Pipe Condition Assessment Program - Year 6 to 10	Miscellaneous Project	Establish a program to inspect the condition of existing gravity trunk collection system with diameters greater than 15 inches (approximately 4% of the collection system), grade the trunk system components, evaluate rehabilitation options and recommend the most effective solution. This type of inspection requires different equipment than is currently owned by the O&M Department and the budget is for the City to hire a consultant to assist with this project. This project does not include condition assessment of the Plant Interceptor or Inverted Siphon.	-	-	-	$1,155,000
83	Year 6 to 10	Plant Interceptor Condition Assessment Program (lower portion)	Miscellaneous Project	Condition Assessment of the Plant Interceptor and Siphon (lower portion not completed in 2017-2018). This project does not include assessment of any piping other than the Plant Interceptor. The Plant Interceptor will be used as a redundant pipeline with the North Interceptor.	-	-	-	$693,000
G	Year 6 to 10	Local Area Improvements - Year 6 to 10	Fund Local Area Improvements	Budget to develop a plan for implementing local area sewer improvements in the system within the City limits. These areas include currently unsewered customers (septic) and areas that have poorly performing systems. Specific details, including pipe alignments, pipe sizes, service areas, timetable of construction have not yet been determined.	-	-	-	$5,775,000
74	Year 6 to 10	Repair/Replace Poor Condition Gravity Pipes - Year 6 to 10	Condition, Trenchless Rehab	Repair or replace gravity collection system that has been identified as condition deficient by the O&M Staff through their CCTV program. City O&M Staff to identify specific schedule for addressing deficient piping. Grade 4 Assessment - 2.3 miles, Grade 4 Assessment - 1.1 miles	-	-	-	$4,492,000
9b-r	Year 6 to 10	Flow Monitoring Program - Year 6 to 10	Miscellaneous Project	Continue operations and maintenance of permanent and temporary flow monitoring equipment.	Utilize data for model calibration and flow analysis for capital projects.	-	-	$289,000
84	Year 6 to 10	On-Call Hydraulic Modeling Services - Year 6 to 10	Miscellaneous Project	Engineering services contract tailored to meet the City's future need of updating the sewer model, adjusting calibration, or answering specific system operational questions. City Project ID SW111CA.	-	-	-	$578,000
85	Year 6 to 10	Collection System Master Plan Update	Miscellaneous Project	Engineering services contract to update the current Master Plan, document changes in the system, update the system analysis and CIP. The update will ensure the City is utilizing up-to-date and accurate information regarding the condition of the collection system, flow projections and applicable regulations.	-	-	-	$1,155,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
136	Year 11 to 20	Large Gravity Pipe Condition Assessment Program - Year 11 to 20	Miscellaneous Project	Establish a program to inspect the condition of existing gravity trunk collection system with diameters greater than 15 inches (approximately 4% of the collection system), grade the trunk system components, evaluate rehabilitation options and recommend the most effective solution. This type of inspection requires different equipment than is currently owned by the O&M Department and the budget is for the City to hire a consultant to assist with this project. This project does not include condition assessment of the Plant Interceptor or Inverted Siphon.	-	-	-	$2,310,000
I	Year 11 to 20	Local Area Improvements - Year 11 to 20	Fund Local Area Improvements	Budget to develop a plan for implementing local area sewer improvements in the system within City limits. These areas include currently unsewered customers (septic) and areas that have poorly performing systems. Specific details, including pipe alignments, pipe sizes, service areas, and timetable for construction have not yet been determined.	-	-	-	$11,550,000
H	Year 11 to 20	Ongoing Repair and Replacement - Year 11 to 20	Fund Ongoing Repair & Replacement	Fund for implementing long term ongoing repair and replacement budget to address condition-related projects in the future. Specific details, including alignment, pipe sizes have not yet been determined.	-	-	-	$31,266,000
9c-r	Year 11 to 20	Flow Monitoring Program - Year 11 to 20	Miscellaneous Project	Continue operations and maintenance of permanent and temporary flow monitoring equipment.	Utilize data for model calibration and flow analysis for capital projects.	-	-	$289,000
134	Year 11 to 20	On-Call Hydraulic Modeling Services - Year 11 to 20	Miscellaneous Project	Engineering services contract, tailored to meet the City's future need of updating the sewer model, adjusting calibration, or answering specific system operational questions. City Project ID SW111CA.	-	-	-	$1,155,000
135	Year 11 to 20	Collection System Master Plan Update	Miscellaneous Project	Engineering services contract to update the current Master Plan, document changes in the system, update the system analysis and CIP. The update will ensure the City is utilizing up-to-date and accurate information regarding the condition of the collection system, flow projections and applicable regulations.	-	-	-	$1,155,000
Expansion Area Infrastructure[3]								
203-n	Year 1 to 5	Development-Based	Elbow Gravity Trunks	New gravity trunk sewers to serve the Elbow	-	Sizing to be determined	3,900 LF	$2,500,000
204A-n	Year 1 to 5	Development-Based	Elbow Lift Station	New Elbow Lift Station	-	Sizing to be determined	To be determined	$600,000

Table 23
Capital Improvement Program

Project ID[1]	Timeframe	Project Name	Type of Improvement	Description	Project Coordination	Recommended Size	Unit, Length, or Capacity	Project Estimate[2]
204B-n	Year 1 to 5	Development-Based	Elbow Force main	New Elbow Force main	-	Sizing to be determined	7,300 LF	$2,900,000
205-n	Year 6 to 10	Development-Based	DSL Gravity Trunks	New gravity trunk sewers to serve the DSL	-	Sizing to be determined	6,600 LF	$4,300,000
206-n	Year 1 to 5	Development-Based	Thumb Gravity Trunks	New and upsized gravity trunk sewers to serve the Thumb	-	Sizing to be determined	8,700 LF	$5,700,000
207-n	Year 1 to 5	Development-Based	West Gravity Trunks	New and upsized gravity trunk sewers to serve the West	-	Sizing to be determined	11,000 LF	$7,000,000

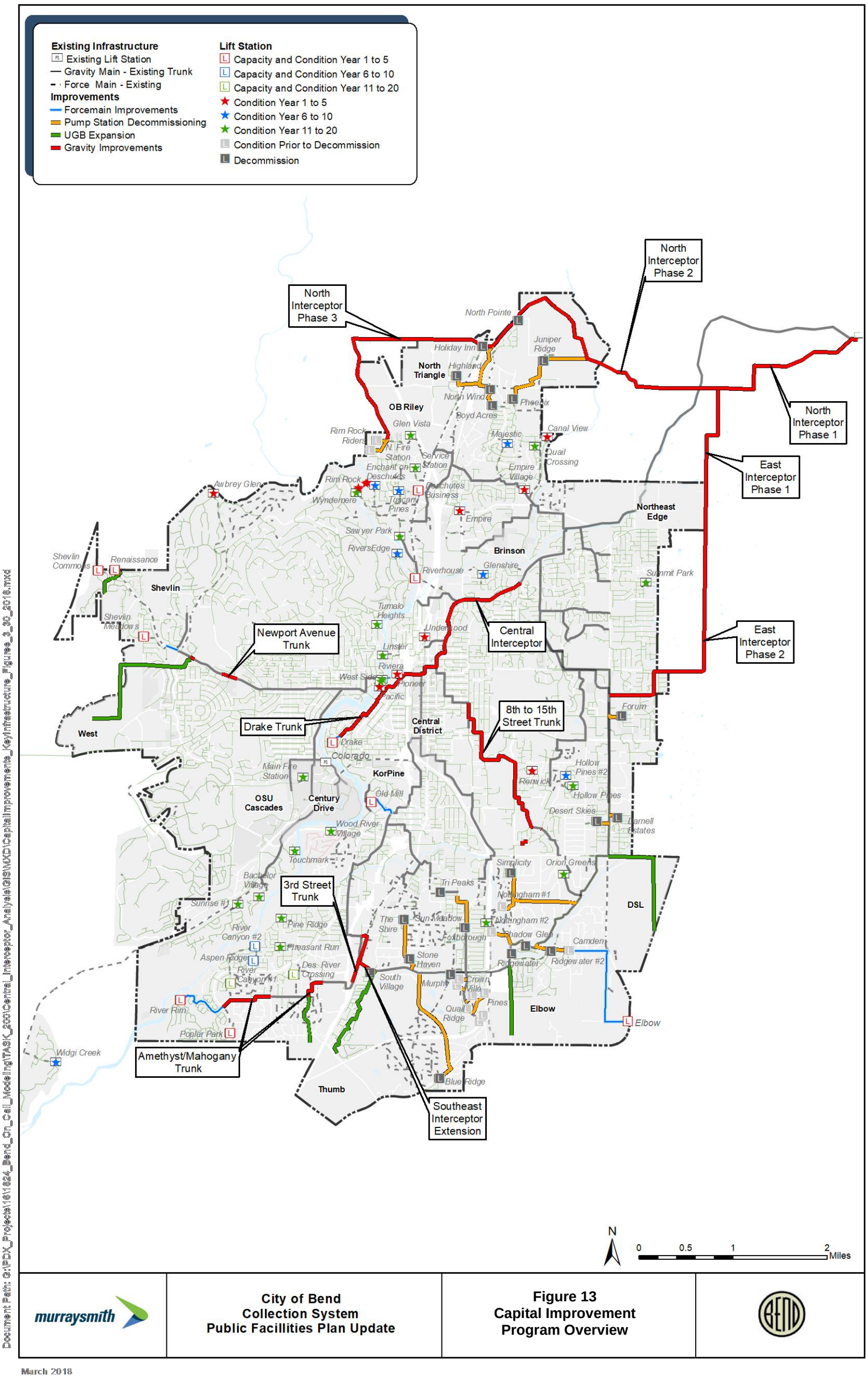
Table 23 Notes:

1 Project IDs from the Collection System Master Plan (CSMP, 2014) were used whenever possible. Where improvements vary in description from the CSMP, a suffix (-r) for "revised" is added to the Project ID. For new improvements, Project IDs are numbered in the 200s with a suffix (-n) for "New" added to the Project ID.

2 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 2017 dollars based on *The Engineering News Record Construction Cost Index* (ENR CCI) basis of 10870 (December 2017).

3 Expansion area infrastructure improvement cost estimates included limited trunk sewer extensions to serve recent UGB expansion areas. A single lift station and force main is identified for the Elbow. The estimates exclude local sewers (8 to 10-inch) and sewer laterals. Projects are anticipated to be funded by developers.

General note: The proposed locations of all public sewer facilities in the CIP and this table are based on conceptual data available at the time the 2018 PFP was prepared. The actual location, routing, type or size of any public sewer facility may vary from what is shown, because of actual physical conditions, the timing of development, the availability or cost of rights of way or easements, final engineering design consideration or other similar reasons. To the extent any planned future sewer improvement is shown on private property, the location is only approximate and does not constrain or limit development on that property. If property is developed before the planned sewer improvement is constructed, the design of the sewer improvement shall avoid conflicts with the development where possible. The location of any public sewer facilities outside the UGB is intended only to provide or facilitate service within the UGB. No new connection that allows for service outside the UGB shall be constructed except for new connections to areas that the City already provides service as described in the CSMP.



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murraysmith	**City of Bend Collection System Public Facillities Plan Update**	**Figure 13 Capital Improvement Program Overview**	BEND

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Table 24
Capital Improvement Program Cost Summary (million $)[1]

Improvement Category	Year 1 to 5	Year 6 to 10	Year 11 to 20	Total
Trunk Sewers and Interceptors	$33.1	$55.1	$29.9	**$118.1**
Southeast Lift Stations Condition and Decommissioning	$12.8	$0.6	$2.0	**$15.4**
South Lift Stations Impacting Amethyst/Mahogany/3rd Street Trunk Sewer	$2.0	$2.1	$0.8	**$4.9**
Other South and East Area Lift Station Condition Improvements	$0.4	$1.2	$4.0	**$5.6**
Central Area Lift Station Capacity and Condition Improvements	$7.7	$0.8	$2.8	**$11.3**
West Area Lift Stations Impacting Newport Ave Trunk Sewer	$2.5	$0.0	$0.1	**$2.6**
North Area Lift Stations Condition and Decommissioning	$0.0	$6.4	$2.0	**$8.4**
Other North Area Lift Station Capacity and Condition Improvements	$1.5	$0.8	$1.3	**$3.6**
Programmatic Funding	$20.1	$14.1	$47.7	**$81.9**
Expansion Area Infrastructure	$18.7	$4.3	$0.0	**$23.0**
Total	**$98.8**	**$85.4**	**$90.6**	**$274.8**

1 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 2017 dollars based on *The Engineering News Record Construction Cost Index* (ENR CCI) basis of 10870 (December 2017).

OAR 660-011-0010(1)(g) Provider Funding

The Provider's (City) overall funding strategy includes the wastewater collection system and water reclamation facility (WRF), collectively referred to in this section as the water reclamation utility (Utility).

The City utilizes a Water Reclamation Fund which charges base fees and volume charges by service type (single family, multifamily, commercial) for wastewater services (collection and treatment) and System Development Charges (SDCs) Fund to finance the Utility.

The overall funding strategy is detailed in the following financial plan.

Financial Plan

The overall goal of the financial plan is to have the annual Utility total resources (rates and fees) set at a sufficient level to meet annual uses (O&M, debt service, capital costs and fiscal policy achievement). This helps ensure a self-supported Utility.

The primary source of funding for the Utility is derived from ongoing monthly charges for service, additional revenue from miscellaneous fees and charges, interest income, SDCs, and long-term debt for capital projects. The City Council controls and approves the level of user charges as needed to meet financial objectives.

The financial plan ultimately evaluates the sufficiency of Utility revenues in meeting all obligations, including cash uses such as the following:

- Operations and maintenance
- Debt service
- Capital outlays for vehicles and equipment
- Reserve contributions
- Coverage requirements associated with long-term debt

Fiscal Policies and Other Constraints

Reserves are among the most important constraints for the financial strategy. Whether because of policy or contract, the City's Utility maintains multiple reserves. Reserve requirements reflected in the fiscal policies adopted by the City Council (Resolution No. 2783, June 2017) include the following:

The City will maintain undesignated reserves of at least 25% (or 3 months) of the operating budget for its utility funds. The Water Reclamation Funds will also have rate stabilization reserves no less than $1 million respectively to protect against volatility of revenues. Ending

fund balance and reserves in the Water Reclamation utility funds will be prioritized as follows:

a. Required debt service reserves
b. Operating reserves
c. Rate stabilization reserves
d. Repair & replacement (R&R) reserves which have been identified as a minimum of $5 million. R&R reserves will be used for significant system or facility repairs, replacement or maintenance costs that are unanticipated and exceed ongoing repair and maintenance expenditures in the fund's operating budget.

In addition to required reserves, a minimum debt service coverage ratio is also a constraint in this plan. This ratio is calculated by dividing net revenues (operating revenues less operating expenditures) by annual debt service.

To best position itself to issue needed debt and uphold credit ratings, the City has elected to maintain a minimum debt service coverage ratio of 1.5 or a ratio at a level sufficient to protect the credit rating of the Utility.

Capital Costs Expenditures

The capital expenditures detailed in the CIP, Tables 23 through 24, are financed from the following resources:

- New debt, including both revenue bonds and loans from the Oregon Department of Environmental Quality (DEQ)
- SDCs
- Sewer rates and fund balance
- Public/Private Partnerships

Projected Revenue Requirements

The revenue requirement analysis forecasts the amount of annual revenue that needs to be generated by user rates. The analysis incorporates operating revenues, O&M, debt service payments, rate-funded capital needs, and any other identified revenues or expenses related to operations. The objective of the financial forecast is to evaluate the sufficiency of the current level of rates. The revenue needs also include debt-covenant requirements and specific fiscal policies and financial goals of the City. The analysis determines the amount of revenue needed in a given year to meet that year's expected financial obligations.

Table 25 summarizes the projected the rate revenue requirement for the first five years of this financial plan:

Table 25
Projected Rate Revenues

Revenues	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
Rate Revenue under existing rates	$25,938,100	$26,298,639	$26,664,191	$27,034,823	$27,410,607
Non-rate Revenues	$946,400	$843,196	$836,378	$828,767	$820,526
Total Revenues	$26,884,500	$27,141,835	$27,500,569	$27,863,590	$28,231,133
Expenditures	**FY 2018-19**	**FY 2019-20**	**FY 2020-21**	**FY 2021-22**	**FY 2022-23**
Cash Operating Expenses	$14,081,570	$16,027,318	$16,113,478	$16,483,778	$17,397,792
Existing Debt Service	$5,323,117	$5,443,147	$5,415,712	$5,398,209	$4,381,375
New Debt Service	$4,556,377	$5,172,384	$5,545,413	$6,411,634	$7,572,796
Total Expenditures	$23,961,064	$26,642,849	$27,074,603	$28,293,621	$29,351,963
Annual Rate/Revenue Adjustments Projected	6%	6%	6%	3%	3%
Cumulative Rate/Revenue Adjustments Projected	6%	12%	18%	21%	27%
Rate Revenue After Rate Increase	$27,364,695	$29,409,768	$31,607,678	$33,158,166	$34,711,684
Net Cash Flow After Rate Increase	$4,350,031	$3,610,115	$5,369,453	$5,693,312	$6,180,246
Coverage After Rate Increase, Revenue Bonds	24.96	24.43	26.34	16.01	8.82
Coverage After Rate Increase, All Debt	1.84	1.68	1.76	1.71	1.79

General note: FY = fiscal year (July 1 through June 30).

Current and Projected Rates

The rate strategy developed by the City implements a 6% rate increase per year over three years. Annual inflationary rate increases are required thereafter to build the debt capacity to fund the Utility.

Current water reclamation rates for fiscal year 2017-2018 can be found in the City's fee resolution (No. 3108, 2017-2018) and are summarized below.

- Single Family Residential - $34.55 monthly base charge and $3.62 monthly volume charge per 100 cubic feet of winter quarter average water usage
- Multi-Family Residential - $13.65 monthly base charge and $3.62 monthly volume charge per 100 cubic feet of winter quarter average water usage
- Non-Residential Standard - $34.55 monthly base charge and $3.62 monthly volume charge per 100 cubic feet of winter quarter average water usage
- Non-Residential Extra Strength (exceeds 500 parts per billion Biochemical Oxygen Demand or Total Suspended Solids) - $34.55 monthly base charge, $35.00 extra strength program fee, and $6.46 to $9.36 monthly volume charge per 100 cubic feet of winter quarter average water usage scaled by discharge concentration

Affordability Analysis

Affordability measures customers' abilities to pay their monthly utility bills. Often, affordability measures relate more to community-wide affordability. Typically, affordability is based upon the local community's median household income and the percentage of median household income dedicated to utility bills.

The City monitors the affordability of its sewer service by comparing the average residential bill (including franchise fee) with median household income. Table 26 summarizes the affordability of residential sewer service for the first five years of this financial strategy:

Table 26
Residential Rate Affordability

User Fees, Income, & Percentage	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
Annual Residential Bill[1]	$666	$706	$748	$771	$794
Median Household Income (Escalated by Expected Inflation)[2]	$64,370	$65,657	$66,970	$68,309	$69,676
Bill as Proportion of Median Household Income	1.03%	1.08%	1.12%	1.13%	1.14%

Note 1. 6-percent increase assumed per year for three years and 3-percent increase assumed thereafter, 492 cubic feet winter quarter average water consumption
Note 2. 2016 median household income of $61,870 escalated by 2-percent annually (United States Census Bureau, American Community Survey, March 2018;/www.census.gov/programs-surveys/acs/)
Note 3. FY = fiscal year (July 1 through June 30)

The affordability analysis indicates the City's rates are below a 1.5% affordability threshold for the five-year period. This does not preclude the possibility that the City's rates may represent more than 1.5% of the household income for some individual households.

System Development Charges

SDCs are one-time fees imposed on new and increased development to recover the cost of system facilities needed to serve that growth. An SDC can include two major components:

- A reimbursement fee that reflects the cost of existing infrastructure with capacity that is available to serve growth
- An improvement fee that reflects the portion of the cost of future projects that is attributable to providing capacity for growth.

The financial strategy above utilizes the City's sewer SDC of $4,655 per equivalent dwelling unit for 2017-2018 as published in the City's fee resolution (No. 3108, 2017-2018). This

plan further assumes that all available SDC revenue will be used to fund projects. SDCs are assumed to increase at an inflationary rate per year. SDC increases may be tied to construction costs utilizing the *Engineering News Record 20 City Construction Cost Index*.

Financial Plan Conclusions

Based on the financial analysis of the Utility and contingent upon the validity of key assumptions described herein, it has been concluded that the City can fund the recommendations of the updated CIP, while meeting existing obligations and policy requirements, by taking the following steps:

- Implement the 6% rate increase for the next three years
- Adopt and implement annual inflationary rate and SDCs increases after the first three years
- Draw down the Utility's fund balance over several years to minimize rate increases
- Expend SDCs for projects whenever possible to mitigate the need to take on additional debt
- Use debt to fund projects as necessary

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Chapter 2: Natural Features and Open Space

Natural Features and Open Space

Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 18, 1998	Resolution #2247	Comprehensive Plan Update
December 6, 2016	NS-2271	Format update, minor text changes to remove outdated text

BACKGROUND

Context

Open space and natural features are an integral part of the Bend Urban Area plan. A wide range of types and sizes of open space and natural features within the urban area should provide: diverse plant and animal habitat, visual and spatial breaks from urban uses, places for recreation and sports activities, facilities for community events, trails for pedestrian and bicycle transportation and recreation, and many other uses. As defined in the plan, open space and natural features may be in the form of: parks, public school grounds, trails, natural areas and areas of special interest, river and stream corridors, open space easements and right-of-way, and lands excluded from development. The preservation and enhancement of open space and natural features, and their incorporation into the infrastructure of the Bend Urban Area is a function of the plan and related ordinances.

Bend is in the center of some of Central Oregon's most exquisite natural resources. The Deschutes National Forest to the west offers easy access for multiple recreational activities, and provides the backdrop of mountain peaks captured in thousands of photos of Bend. To the east of the urban area, there are thousands of acres of juniper and sagebrush lands. These lands form the edge of the Great Basin, and offer a different type of open space.

The interaction of land, water, plants, and wildlife through the millennia created a place that attracted—and still attracts—people because of its beauty and natural features. Bend is a community that values the area's natural features and has tried to incorporate natural features in the design of the built environment. Volcanic rock has been incorporated into hundreds of retaining walls, foundations, porches, steps, chimneys, and even in the main walls of homes and businesses. Public parks and trails follow the river through town. Mature pine and juniper trees have been preserved in developments, in parks, and in the design of sidewalks and streets.

Maintaining the natural features and open space in an urban area is a difficult task, and one that becomes more complex during periods of rapid population growth. However, providing open space in the urban area for the benefit of existing and future residents is important. To help ensure Bend's livability, the following additional goals should be implemented to provide long-term protection of open space and natural features:

- to preserve interesting and distinct geologic formations and areas of natural vegetation;
- to provide land for recreational uses such as hiking, photography, bicycling, jogging, or fishing;
- to preserve water resources, riparian areas, and wildlife habitats;
- to establish a system of trails, greenways and wildlife corridors that are interconnected;
- to shape the urban development and provide visual relief from developed land;
- to soften the appearance of street corridors with planter and median strips;
- to encourage environmental awareness so that citizens will become stewards of our natural areas; and
- to support the coordinated efforts of public agencies, private organizations and individuals to preserve and enhance the area's natural features and open space.

The Bend Comprehensive Plan and implementing codes support management practices to

preserve, maintain, and create natural features, open space, and Areas of Special Interest. The Preamble, the goal statements, and several Plan policies in this chapter speak to the importance of preserving and managing natural features. The city and county zoning codes also regulate development within the Deschutes River Corridor to protect the riparian areas and river rimrocks. Site plan reviews provide the opportunity to preserve natural areas through building setbacks, conservation easements, and other measures.

Overview

This chapter describes the many types of open space and natural features that add to the quality of life for our residents. Public parkland and natural areas, an important component of Bend's quality of life, are mentioned briefly in this chapter as a type of open space. The public parks and recreation programs in the urban area are described in more detail in Chapter 3, *Community Connections*. Other related topics that also contribute to our quality of life are covered in the Chapter 9, *Community Appearance* and Chapter 10, *Natural Forces*.

That the settlement of Bend is here at all is a result of dynamic natural forces that shaped the landscape. The lava flows and volcanic ash, in place before the elk and cougar roamed the area, form the canyon walls and punctuate the urban area with rock outcroppings, ridges, and cinder cones. The Deschutes River, and smaller streams that have long since disappeared, cut through the lava and ash, and brought life to the land. Animal and plant species that adapted to the dry summers and snowy winters of Central Oregon over hundreds of thousands of years still grace the urban area today.

A city is the sum of physical, biological, and historical processes that shape the social values and image of the community. The natural features such as the rock outcroppings, native vegetation, the river, and wildlife frame Bend's special character and sense of place. Which natural features have some intrinsic value, and how much land should be preserved, are questions that Bend area residents wrestle with as they seek to balance the value of growth and the value of preserving natural areas.

As regional and national developers "discover" Bend they seek to bring their national look to the urban area. The city and county will need to be stronger in reflecting the community's desire to incorporate natural features and native materials into commercial and residential development.

Open Space

The irregular terrain and native vegetation in Bend give the area a distinctive visual character and quality. These features limit views within the community, thereby creating a sense of a smaller urban area. Land in all parts of the urban area that has been vacant for decades is being developed. This development is changing the feel of the community from a rural town to an urban city. The expansion of development may reduce or change the open space and natural features that "break-up" the appearance of the man-made environment.

Open space is clearly a broad term that can apply to many types of undeveloped and improved land. Table 2-1 describes six types of "open space" that exist to a greater or lesser degree within the urban area.

Table 2-1 Types of Open Space

Table	Purpose	Examples	How to provide/conserve
Natural areas	• retain or restore natural landscape and vegetation • provide wildlife habitat	▪ undeveloped park or public land ▪ landscape areas left in natural state ▪ PUD common areas ▪ subdivision common areas	○ PUD development ○ flexible subdivision standards ○ commercial landscape standards ○ private or public land trust
Large developed	• active or passive recreation • places for gatherings	▪ community and neighborhood parks, ▪ school grounds, ▪ PUD common areas, ▪ golf courses	○ property tax revenues ○ user fees / SDCs ○ PUD requirements ○ private investment
Small developed	• areas for quiet enjoyment • relaxation or resting spot • visual break	▪ 'pocket parks', ▪ excess right-of-way, ▪ planter in middle of cul-de-sac bulb, ▪ subdivision entrance, ▪ commercial plaza, ▪ grounds around public utility facilities	○ require during development ○ property owners association ○ flexible subdivision standards ○ property tax measures ○ sensitive design and construction
Corridor or linear	• visual break • community appearance • design rhythm • pedestrian amenity • wildlife corridor	▪ irrigation canals ▪ developed trails ▪ river canyon ▪ pedestrian walkways ▪ street planter strip and median strip	○ easements or dedications ○ setback regulations ○ transportation corridor designs ○ property tax revenues
Perimeter	• physical or visual break between uses • passive recreation • wildlife habitat / corridor	▪ forest and BLM lands, ▪ regional park land ▪ subdivision buffer to protect wildlife	○ public acquisition or ownership ○ developer design ○ conservation easement
Private spaces	• passive or active recreation • relaxation and resting • wildlife habitat	▪ house or multi-family yards ▪ private recreation facilities	○ private ownership ○ association dues ○ land trust purchase

The list below is from the city's inventory of open space lands held by both public and private parties within the Urban Growth Boundary. The inventory is based on tax parcel ownership, and therefore provides only a rough estimate since some trail corridors, Planned Unit Development (PUD) common areas, irrigation District easements, and golf course properties may not have distinct tax parcel numbers.

Deleted: This list was recently updated to reflect more current land holdings.

Public park and recreational facilities	917	acres
City, county and other public properties	1,321	acres
School district holdings	524	acres
Private open space and recreational sites	1,537	acres
Irrigation Districts	178	acres
Total Acres	4,166	acres

Commented [QK1]: BPRD owns 3,035 acres of developed and undeveloped park and recreational facilities, 917 acres are within the Bend UGB.

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Although this number gives a rough estimate of total acreage, it does not describe the size, type, or land use that is currently considered as "open space." The city and county will continue to monitor the creation and conversion of open space in the urban area, and evaluate or modify as necessary the open space designations on the Plan map. The types and amount of open space will be reviewed in future updates of the Plan.

"Areas of Special Interest" and Natural Features

One of the common desires mentioned by residents through more than 20 years of community planning has been to retain and conserve the natural character of Bend as the community grows and changes. Although it is difficult to precisely define what "the natural character" means to people, it can be considered a composite of features typical to Bend: ancient volcanic rock outcroppings, large ponderosa pines and junipers, the Deschutes River, improved public and private open space, and a relative abundance of wildlife and waterfowl.

"Areas of Special Interest" are designated on the Land Use Map because they have features typical of Central Oregon, or represent important wildlife areas. The most significant are the River Corridor Areas of Special Interest along the Deschutes River, which includes the river canyons and rimrocks in the north and south portions of the urban area. At the south edge of the urban area the River Corridor Area of Special Interest includes wildlife habitat areas along the river canyon and a cinder cone. The smaller, scattered Areas of Special Interest on the Plan Map are the more prominent rock outcrops and rock ridges in the urban area. They are not specifically inventoried with respect to size, quality, or importance. These high points break the line of sight so that the area retains a feeling of undeveloped open space. Because these

Areas of Special Interest are small and the scale of the Plan Map is large, the indication on the Map represents the approximate location of the area. More detailed contour maps have been developed and the sites inventoried to determine the specific boundaries of the Areas of Special Interest.

Keeping these features relatively intact will help retain the natural character of Central Oregon as the community grows. The Areas of Special Interest and other natural areas can be retained as either public or private open space. Some sites within the urban area are already protected because they are owned and managed by public agencies.

The city has changed its codes to provide incentives or encourage developers to preserve natural features. Such code changes shall include, but are not limited to, the following:

- A new "cluster housing" subdivision option specifically aimed at preserving natural features;
- Flexible minimum residential density standards on sensitive lands to protect natural features.
- Provide density credit equivalent to the area being preserved;
- Flexible setbacks, lot coverage, and parking standards for site development;
- Opportunities for tax benefit in accordance with the provisions of the Deschutes County Tax Assessor;

Local governments and special districts can also preserve or conserve natural areas through several non-regulatory measures. They can:

- seek donations or gifts of land from private parties;
- request transfer of land from federal agencies or other governmental organizations;
- purchase land using revenue from bonds, system development charges, or other fees;
- obtain conservation easements along the river or other sensitive areas to protect wildlife habitat;
- include natural features and open space in the design of reservoirs, pump stations, and other such utility facilities; and
- locate transportation and utility systems to avoid natural features and Areas of Special Interest.

Natural areas can also be retained in private ownership in a variety of ways without adversely affecting the density or development potential of a site. The city and county encourage the private sector to preserve natural areas within subdivisions and other developments. Many local developers have accommodated the goal of conserving natural features by incorporating rock outcroppings, mature trees and native vegetation and related features into their projects by:

- including them within common areas in Planned Unit Developments or subdivisions;
- including them within the undeveloped street right-of-way;
- adjusting lot lines and street patterns to leave them in the non-buildable setback areas; and
- making them part of the required landscape area in commercial, industrial, and

multi-family projects.

Deschutes River Corridor

The Deschutes River is a thread that weaves the fabric of the community together. It runs for eight miles through the middle of the urban area, and flows past industrial, commercial, mixed-use, parks, and all categories of residential lands.

The river has served many needs of the community, and in doing so, has become a common reference for the citizens. The Deschutes River was used to transport and store logs for the two sawmills south of downtown. It is a source of water for agricultural lands and power for homes. It has been the setting for recreation, community festivals, and entertainment for decades. With stretches of both fast-moving and still waters, the Deschutes River provides food and home for wildlife, and a respite for humans from the pressures of work and life.

The importance of the river is underscored by state and local actions. In 1983 Deschutes County and Bend established a moratorium on hydroelectric facilities and created the Deschutes Basin Task Force committee to study the natural resources of the Deschutes River and its tributaries. The reports and other studies produced by this task force are background documents for this Plan, and the work from this committee influenced the development of rules to protect the river resources. Policy recommendations from the Task Force are included in a separate section of policies in this chapter and also included in the Deschutes County Comprehensive Plan.

In 1988 a statewide voters' initiative added several miles of the Deschutes River to the state's scenic waterway program, including about two and one-half miles within the urban area. The area from the south urban growth boundary line to the Central Oregon Irrigation district diversion is classified as the *South Bend River Community Area* in the state's scenic waterway program. At the other end of the urban area, the stretch of river from the south edge of Sawyer Park to the north urban growth boundary is classified as the *North Bend River Community Area*. Both scenic waterway areas are considered significant "Goal 5" resources under Oregon's land use planning program. The Oregon Parks and Recreation Department has the authority to review and approve any development along these scenic waterway segments. In addition to the river segments protected by the State, the City recognizes the significance of the north and south river canyons for their beauty and recreational opportunities. Both the north and south river canyons have been included in the City's inventory as a "Goal 5" scenic resource.

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In the early 1990s the city and county adopted special Deschutes River Corridor development standards to recognize and respect the unusual natural beauty and character of the Deschutes River. The city has also adopted a Mixed-use Riverfront zone that allows for the redevelopment of land along the river previously used by sawmills. This zoning district is designed to enhance the natural character of the river and to encourage access to and the enjoyment of the river corridor.

Wetlands and Riparian Areas

Wetlands and riparian areas have a variety of native plant species that are adapted to growing in locations where the soils are wet during all or part of the year. Well established wetlands and riparian areas provide a complex ecosystem that support a diverse combination of plants and animals.

It is important to conserve and improve the wetlands and riparian areas along the Deschutes River and Tumalo Creek in Bend. These areas serve several functions that protect and enhance the quality of both animal and human life within the urban area in many ways. Wetlands and riparian areas:

- Reduce stream velocities that can erode or damage stream banks and property.
- Provide storage for water during peak flows and flooding conditions.
- Trap or filter sediment and runoff water from upland areas and impervious surfaces.
- Provide shade over the river that helps water quality by reducing the warm water temperatures that produce algal blooms.
- Provide shade to help moderate water temperature to support fish and other aquatic animals.
- Provide vegetation and woody debris that serve as habitat and nesting areas for a variety of aquatic animals, birds, and mammals.
- Provide a safe corridor for birds, amphibians, and mammals that live and feed along the river.

- Provide a transition area between aquatic and upland habitat areas during animal migration.

Wetlands within Bend were inventoried and evaluated in the summer of 2000 as part of the preparation of a Local Wetland Inventory, a required Periodic Review update of the Comprehensive Plan. The photo below is an example of the significant and non-significant wetlands mapped during this Local Wetland Inventory process. Table 2-2 lists the significant wetlands. All of the significant wetland sites are along the Deschutes River.
Bend's Local Wetland Inventory replaces the older National Wetlands Inventory map for the urban area.

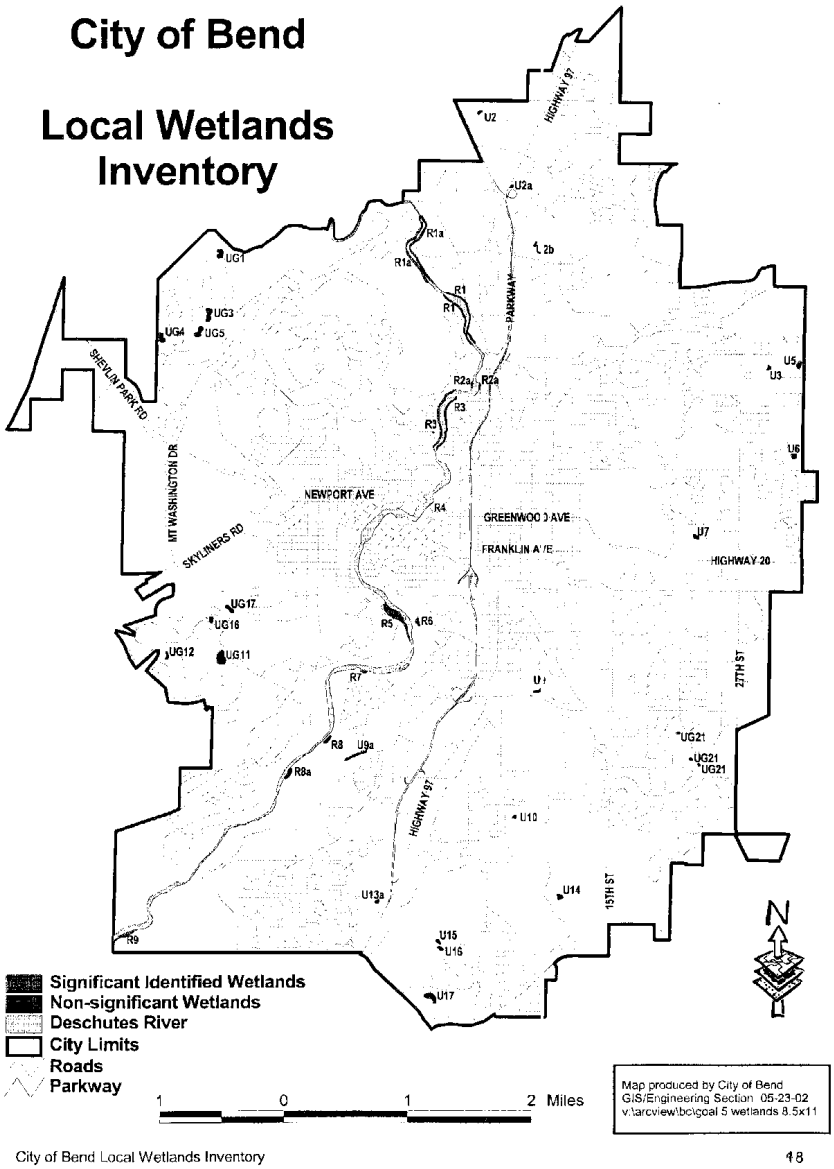
In 2000, the riparian areas within Bend were also inventoried and evaluated. The riparian area along the Deschutes River and Tumalo Creek are considered significant resources under Statewide Planning Goal 5. Conflicting uses within the riparian corridor are primarily existing and future residential development, new park development, commercial development and other uses such as roads, trails, and docks.

Any development within the bed of the Deschutes River or Tumalo Creek, or within the riparian corridor, including the removal or enhancement of riparian vegetation, must meet standards in the city's land division and zoning codes. In addition to local code requirements, the Oregon Division of State Lands and Oregon Department of Fish and Wildlife have responsibility to review and approve developments within wetlands and the Deschutes River.

Table 2-2 Significant Wetlands in Bend

Inventory Field Code	General Location of Wetland
R9	At south edge of UGB on east side of river. Land area about 2.5 acres
R8a	Upstream from COI hydroelectric plant. Land area about 1.5 acres.
R8	Downstream from COI hydroelectric plant. Land area about 1 acre
R7	Downstream from old log deck footbridge, east side. Land area less than 1 acre.
R5	Upstream from Colorado Ave. bridge on west side. Land area about 6.5 acres.
R4	Downstream below Newport Bridge on east side. Land area about 1 acre.
R3	Both sides of river below 1st Street rapids along the River Run trail and below cliffs. Land area about 5 acres.
R2a	Just upstream from North Unit dam. Land area about 2.5 acres.
R1	Between Riverhouse motel to Sawyer Park. Land area about 5 acres.

R1a	Series of small wetlands from Sawyer Park to RimRock Village footbridge. Land area about 3 acres.

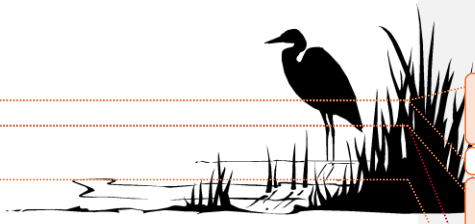


City of Bend Local Wetlands Inventory

Fish and Wildlife

There are several key wildlife areas in Bend. The most important, and most diverse, wildlife area is the riparian corridor and canyon walls along the Deschutes River. The combination of still waters, rapids, the many species of shrubs, bushes, and trees, and the rock outcroppings provide a variety of important habitats and food sources. Wildlife species that inhabit the Deschutes River corridor include: deer, elk, cougar, otter, beaver, mink, raccoon, osprey, red-tailed hawk, bald eagle, kingfisher, trout, whitefish, and several species of reptiles, amphibians, and waterfowl. Although there are many species that occupy the river corridor, the Oregon Department of Fish and Wildlife has determined that there are no significant wildlife habitat areas or nesting sites within the urban area that require special land use protection. Even though there are no "significant" wildlife resource areas, because of its value to wildlife and its related benefit to area residents, the river canyon corridors in the south and north parts of the urban area identified as an Area of Special Interest in the Comprehensive Plan and shown on the Plan Land Use Map.

At the west edge of the urban area is Tumalo Creek, a second important riparian and wildlife area. The Bend Park and Recreation District manages about 963 acres along the creek for passive recreation such as hiking and picnicking.



Most of the area along Tumalo Creek is in a more natural condition than the urban portion of the Deschutes River. Because of that, the Tumalo Creek area is a more diverse and complex habitat than the Deschutes River corridor, and supports larger wildlife such as coyote and cougar. The Oregon Department of Fish and Wildlife has not identified any significant habitat areas or nesting sites within the city portion of Tumalo Creek that warrant special protection measures.

West of the urban area in the Urban Reserve and adjacent forest lands there are areas where deer and elk herds feed during the winter when they move down to lower elevations out of the deep snow.

The winter range is mainly north of the river, but herds may also move across the river into the southwestern portion of the urban area. The Oregon Department of Fish and Wildlife has designated and mapped elk habitat and deer winter range areas, but these designations do not extend into the urban area. Lands within the UGB are not critical to managing the elk herds and maintaining healthy herd populations.

In addition to these two areas, there are many smaller, more separate enclaves of natural features and native vegetation that the community seeks to conserve within developments. Several species of squirrels and chipmunks, lizards, snakes, quail, and many other bird species all find food and shelter in small natural areas and even in patches of natural habitat common to many residential yards.

Besides being beneficial to the wildlife, these habitat areas also provide opportunities for residents and visitors to observe and enjoy the interaction of natural plant, animal,

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Commented [QK3]: Referring to Shevlin Park-please update this number to 963 acres (this number isn't subject to change for many years).

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and aquatic communities within our urban area.

Policies

Natural Features and Open Space

2-1 The city will inventory and maintain a list of natural features and open space lands that are important to the community.

2-2 The city and Bend Park and Recreation District shall share the responsibility to inventory, purchase, and manage public open space, and shall be supported in its efforts by the city and county. The City recognizes the Park and Recreation District as the urban service provider of parks within the UGB.

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2-3 During January of each "odd numbered" calendar year, individuals may apply to the City for new ASI designations to be added to the Comprehensive Plan and the zoning maps. During the same period of time, the City shall review city owned properties for potential new ASI designations.

2-4 Detailed maps of the Areas of Special Interest shall provide guidance to property owners and staff in interpreting the ASI boundary location.

2-5 The City shall review proposed developments that include Areas of Special Interest and natural features identified on the Plan Map to ensure they follow the policies of this Plan.

2-6 Major rock outcrops, stands of trees, or other prominent natural features identified in the Comprehensive Plan shall be preserved as a means of retaining the visual character and quality of the community.

2-7 Natural tree cover should be retained along streets in new developments to retain the natural character of Central Oregon within the urban area as the community grows.

2-8 All residential development should respect the natural ground cover of the area, and the city shall work with developers to preserve mature trees within the subdivision.

2-9 The City shall develop standards to conserve mature native trees and standards that describe the types of trees for commercial and industrial developments that are compatible with Central Oregon's climate.

2-10 The City shall participate with other governments, special districts,

non-profit organizations, land trusts, interested businesses, and citizens in protecting open space.

2-11 The City shall develop flexible subdivision and development standards that make it easier for developers to provide open space within a neighborhood.

2-12 The City shall evaluate and adopt standards for the types of landscape materials and amount of open area buffers around structures that reduce the risk of loss from wildfires at the edge of the urban area.

2-13 The City shall have the primary responsibility for reviewing land development that includes opportunities for the creation of private open space areas.

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2-14 The City will consider how best to protect important native fauna and flora within the Bend urban area, as identified by the open space and natural features inventory.

Deschutes River Corridor

2-15 The City shall seek opportunities to retain the banks and canyon of the Deschutes River as public or private open space throughout its entire length within the planning area.

2-16 Within the Areas of Special Interest designated on the Plan Map, the city and county may allow developments that carry out the intent of the Plan to enhance the variety and livability of the Bend Urban Area, and provided that such developments:

- are not subject to natural hazards;
- would not inflict irreversible harm to the riparian zone;
- would enhance public open space, parks and access;
- are designed to be compatible with natural features; and
- provide access to the river or a trail along the river corridor to the extent allowed by law.

2-17 The City shall prepare development regulations to further reduce visual and ecological impacts of development along Tumalo Creek and the Deschutes River.

2-18 The City shall request that the ODFW develop a list of trees and vegetation appropriate for planting along the Deschutes River. The list shall be used during design review of proposed riverfront development when landscaping or screening issues are considered.

Fish and Wildlife

2-19 The City shall ensure through conditions of approval that development in the Urban Reserve Area adjacent to or within one mile of lands designated by the County's wildlife overlay zone incorporate setbacks or buffers to protect designated wildlife areas.

2-20 All trout spawning areas shall be considered significant habitat and shall be protected.

2-21 The City shall promote and support educational programs on riparian natural history, river maintenance and courtesies, impacts of habitat alteration, and habitat disturbance by domestic animals and human activities.

2-22 The City shall request that the USFS and ODFW adopt a winter elk management plan for the Benham Falls elk herd. Emphasis should be given to identification of their sensitive habitat in order to minimize potential conflict with development and recreational activities.

2-23 If significant Goal 5 wildlife habitat areas or nesting sites are documented during future Periodic Review inventory work the City will adopt new protection measures if existing codes are not adequate to protect the resource.

Wetlands and Riparian Areas

2-24 The City's Local Wetland Inventory map and list in the Comprehensive Plan replaces the National Wetlands Inventory map for the area within the Urban Growth Boundary.

2-25 Wetland areas that are significant Goal 5 resources to be protected through the city's riparian corridor standards are those areas listed and mapped in the Comprehensive Plan.

Deschutes Basin Study Policies

The following policies were developed by the city, county, and a citizens committee in the late 1980s in response to a number of issues that could impact the Deschutes River. Most of the policies deal with issues of regional or statewide significance, and are therefore beyond the scope of the Bend Area Comprehensive Plan.

1. The City and county shall establish a water conservation committee including, but not limited to, local representatives from the irrigation districts, Department of Water Resources, Department of Fish and Wildlife (ODFW), United States Forest Service (USFS), Deschutes County and the City of Bend Planning Department, and Deschutes County and Bend Planning Commissions to provide an ongoing forum regarding water management on the Deschutes River and its tributaries and to make recommendations to

appropriate agencies. The committee should:

i. Request assistance through Bonneville Power Administration's (BPA) technical assistance program for technical improvements in methods of irrigation and means of conservation of both water and energy.

ii. Request assistance from the Water Resources Department, Bureau of Reclamation, and Soil and Conservation Districts to initiate an in-depth study of, and to set priorities for, actions that should be taken to improve the irrigation districts' delivery systems.

iii. Assist the county and City in the implementation of the goals and policies of this section.

2. The City and county shall petition the Water Resources Department to amend the appropriate provisions in the Deschutes River Basin Plan to reflect the recommendations of the River Study Task Force.

3. The City and county shall petition the State Legislature to amend state law to designate in-stream use as a beneficial use to ensure that rights designated to in-stream use shall not be subject to downstream appropriation by holders of equal or junior rights, and petition the Water Resources Department to adopt a uniform, easily-accomplished process for the transfer of water rights in the Deschutes River Basin to in-stream use.

4. The City and county shall petition the Bureau of Reclamation to conduct a feasibility study on the Manner Reservoir site, including (a) the non-irrigation flow required for filing, (b) to what extent gravity feed irrigation would be possible, and (c) to what extent low flows below Wickiup Dam could be augmented during the non-irrigation season.

5. The City and county shall petition the Bureau of Reclamation, USFS, United States Geological Survey (USGS), and the Oregon Department of Environmental Quality (DEQ), to establish a bedload of sediment monitoring program and to determine an appropriate maximum discharge from Wickiup Dam, which program addresses the effects of bank erosion on rehabilitation of spawning habitat, riverfront property, recreation and scenic values, and accomplishes the determination of flow regime through interagency cooperation with the affected irrigation districts.

6. The City and county shall petition the Bureau of Reclamation to determine what the consequences would be to irrigation districts, recreation use, and the stabilizing of water releases below Wickiup Dam by maintaining a lower level of water in Crane Prairie Reservoir, and diking off known high loss areas within the reservoir to minimize excess seepage.

7. The City and county shall encourage the Water Resources Department, irrigation districts, and municipalities utilizing diverted waters to enforce the

"without waste" provision in appropriated water rights.

8. The City and county shall support efforts by the irrigation districts to provide financial incentives to conserve water. This incentive could be determined for example, by a water use fee on the minimum amount of water required (commensurate with the plant/soil requirements determined by the soil and water conservation districts) and an excess charge for water used over the base amount.

9. The city and county shall support efforts by the irrigation districts within the upper and middle Deschutes River Basin to allow expansion of irrigated land within a district's boundaries, as part of a means to share conserved water, for those districts that implement water conservation and in-stream flow enhancement programs.

10. The City and county shall encourage examination by irrigation districts and the Water Resources Department of options for providing additional flows below the North Canal Dam during the irrigation season. These additional flows shall not take the place of the current 30 CFS spilled by agreement with Central Oregon Irrigation District (COID), and North Unit Irrigation District (NUID). Options that might be considered include shared conserved water, public participation in irrigation district improvements, public "buy down" of interest rates on improvement loans, and public or private purchase/transfer of water rights for in-stream use.

11. The City and county shall continue to replace the Tumalo water supply pipeline. When this pipeline is complete, gates should be installed at the intake, which would help stabilize withdrawals from Tumalo Creek.

12. The City and county and Tumalo Irrigation District shall explore options to improve in-stream flows and fish habitat in Tumalo Creek. Tumalo Irrigation District should consider apportioning their water draws to maximize the use of the Tumalo Feed Canal rather than the Columbia Southern Canal. This action should increase water flows through Shevlin Park and minimize the excessive water losses that now occur in the Columbia Southern Canal.

13. The City and county shall continue to strongly support and promote the conservation of all forms of energy resources through cooperation with the Northwest Power Planning Council, Bonneville Power Administration programs, recycling, solar ordinances, energy-efficient building standards, and appropriate geothermal resources.

14. Hydroelectric projects that are not physically connected to an existing dam, diversion, or conduit are prohibited.

15. The City and county shall develop a program to assure that hydroelectric projects located within existing man-made transmission systems and using existing flow regimes, or physically connected to an existing dam, diversion, or conduit, but not using existing flow regimes, are subject to the following provisions:

i. Are consistent with federal and state law.

ii. Hydroelectric projects shall not increase the maximum surface area of an impoundment behind an existing dam or diversion.

iii. Hydroelectric projects shall not be located in significant/sensitive fish or wildlife areas unless it can be demonstrated that the project, if constructed, would restore significant/sensitive fish or wildlife habitat in the reach affected by the project.

iv. Hydroelectric projects shall stabilize stream flows, restore degraded trout habitat, and provide public access to as great an extent as practical.

v. Hydroelectric projects shall avoid adverse impacts if possible. Where not practicable, impacts shall be minimized, while providing for restoration of already adversely impacted areas along the river or stream. Restoration does not necessarily have to be in the immediate project vicinity.

vi. Hydroelectric projects shall have no adverse impact to water-related and water- dependent recreation unless it can be shown that existing water-related and water- dependent recreation of the same type, quality, and quantity as that which may be lost can be restored or enhanced in the project vicinity. Recreational activities include those activities that occur now and which may reasonably be expected to occur in the future.

vii. Hydroelectric projects shall include a river restoration plan documenting both on-site and off-site restoration and enhancement strategies consistent with adopted goals and policies. The plan shall identify costs, time schedules, and coordination actions with all affected parties. The plan shall address, but not be limited to stabilizing water flows, trout habitat restoration, and public access. No hydroelectric project shall be permitted until the plan has been approved through the public review process.

viii. Hydroelectric projects shall post a performance and restoration bond to ensure implementation of the approved restoration plan.

ix. Hydroelectric projects shall be consistent with the provision of the Columbia River Fish and Wildlife Program and the Northwest Power Plan as adopted by the Northwest Power Planning Council.

16. The City and county shall recommend to the State Transportation Commission that the Deschutes River from below Wickiup Dam downstream to the first COI diversion, and from Sawyer Park north to the county line be included in the State and Federal Scenic Waterways Programs.

17. The City and county shall support the designation of appropriate segments of Fall River, Little Deschutes River, and Crooked River as state and/or

federal scenic waterways.

18. Support the creation of a nonprofit, private organization that would take a complementary role in the acquisition of property to further the goals of preserving areas for the scenic, recreational, fish and wildlife values.

19. Buildings near the riverfront district should not constitute a physical barrier between the core and the river.

20. The City and county may require public access for any land use action adjacent to the Deschutes River and Tumalo Creek. Access may be limited to foot traffic only; other non-motorized traffic may be negotiated by the city or county.

21. The City and county shall include in all public access easement provisions addressing safety, security, vandalism, litter and any other maintenance concerns expressed by the landowner. The cooperation of the State Police and County Marine Patrol should be sought in working with these landowners and in maintaining the easement agreement.

22. The City and county may accept by donation, fee title ownership for any riparian land for which public access is being required. If the city or county refuses to accept ownership, any required public access shall be waived.

23. The City or county may grant exceptions to the public access requirement where access would be near the nest sites of protected or sensitive wildlife species. In such cases, the city or county shall instead require a conservation easement to protect the nest sites from harassment and disturbance, using the assistance of the USFS, ODFW, and citizens knowledgeable of the nesting requirements of these species prior to drafting the easement.

24. The City and county shall request the Legislature to allow the County Assessors to recognize these public access easements in their assessment policies.

25. The visual impact of excavations or structures that will be erected or substantially modified along the rimrocks bordering the Deschutes River or Tumalo Creek shall be minimized.

26. Citizens groups, business associations, and private foundations and organizations should be involved in developing and implementing a greenway plan along the Deschutes River and Tumalo Creek.

27. The City and county shall support a riverfront development plan in conjunction with a county-wide greenway project.

Chapter 3: Community Connections

Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 18, 1998	Resolution #2247	Comprehensive Plan update
October 4, 2006	NS-2025	Text amendment to remove “Mill A” from inventory of historic sites
July 15, 2009	NS-2123	Text amendment to add Nels and Lillian Andersen House to Table 3-1
June 17, 2015	NS-2243	Text amendment to remove Brooks Scanlon Craneshed building from the inventory of historic sites.
December 6, 2016	NS-2271	Format update, minor text changes to remove outdated text

BACKGROUND

Context

Within the Bend Urban Area are many public agencies and private organizations that impact the governmental, educational, recreational, social and cultural aspects of our community. These agencies include state, county and city governments, Bend-La Pine School District and Bend Park and Recreation District, social service and cultural agencies, historical preservation and art organizations, and others. The Comprehensive Plan and related ordinances shall consider the interconnection among these agencies and organizations and their missions.

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The topics in this chapter deal with history, culture, parks and recreation, and public education. Some of these topics are affected by forces that are outside the bounds of local land use planning. For example, there may be state rules that override local policies, and community cultural programs often change with the citizens' interests and support. For that reason, the goals below provide direction only for those topics that may be affected by land use planning:

- to encourage the preservation of historic and cultural resources within the urban area;
- to foster a sense of historic awareness among the citizens of the community;
- to expand the number and variety of cultural and artistic venues held downtown and elsewhere in the community;
- to provide quality green spaces, natural areas, and recreation sites through public and private park land throughout the community; and
- to coordinate the development of future park and school sites to serve the expanding urban area population.

Overview

Planning for a community is more than measuring the number of dwellings, the variety of jobs, or the miles of roads. The topics in this chapter describe other less tangible, but equally important, conditions that will shape the future of Bend.

Primarily, the topics in this chapter affect the quality of life at a more personal rather than economic level for Bend urban area residents. However, the quality of our schools, parks, and cultural activities bolster the economic well-being of our community. The discussion below, and the policies at the end of this chapter, show how these topics fit into the comprehensive planning for Bend's future.

Historical Features

Bend has a relatively short modern history, but a much longer Native American history, going back thousands of years, as evidenced by the archaeological resources found along the river. While most archaeological resources have likely been destroyed within the urban area, there are a significant number of sites around the city that have been identified.

United States government scouts, such as John C. Fremont, and government survey teams explored Central Oregon in the 1840s and 1850s, but it was not until the 1870s that the first permanent settlement was established in the area. By 1877 a land claim was filed for the "Farewell Bend" ranch, located at the dramatic 90 degree bend in the Deschutes River just south of what is now downtown. A post office for the Farewell Bend settlement was applied for in 1886, and granted that year under the name of Bend.

In its earliest days, Bend was a small trade center for the agricultural and ranching operations to the east and north. Shortly after the turn of the century, East Coast developers formed the first irrigation companies in the area, and construction was begun on several large canals and dams needed to take water out of the Deschutes River to irrigate the high, dry desert. The main canals are still in operation today, and snake through Bend as they carry water to agricultural lands as far away as Madras, 40 miles to the north.

The City of Bend was incorporated in 1905, with a population of about 500 persons. In the next decade, two events changed the direction of Bend for the next half century. In 1911 the Oregon Trunk Line Railroad coming south from the Columbia River was completed to Bend. The railroad created a new lifeline to move people and products in and out of Central Oregon. Four years later, two large Minnesota lumber companies, the Shevlin-Hixon company and the Brooks-Scanlon company, announced plans to build large sawmills on each side of the Farewell Bend stretch of river.

Figure 3-1. Shevlin-Hixon mill on east side of river as seen from Brooks-Scanlon mill

The railroad and lumber mills created an explosion in Bend's population and increased the number of residents to more than 5,000 persons by 1920. These same forces led to a tremendous growth in commerce and housing that is still evident today in much of downtown and older residential areas west and south of downtown. As a result, many

of the historic buildings and structures listed in the city's inventory of historical buildings and places are direct products of the boom period of the first part of the 20th century.

The Bend area history is recorded by the Deschutes County Historical Society. This organization maintains and operates the Des Chutes Historical Center in the old Reid School building at the south end of downtown. The Historical Society assists the city and county in their efforts to assess, record and preserve historic and cultural sites within the urban area. Such efforts are important because:

- public awareness of Bend's historical and cultural background has been and will continue to be an important source of knowledge, pride, education, and enjoyment for visitors and residents;
- rapid growth and development make it imperative that the city's historical and cultural resources be identified and protected; and
- properly restored and utilized historical and cultural resources enhance the economy of the area.

Oregon Administrative Rules describe how local historic resources are to be evaluated, and the rules establish certain standards for historic resources of "statewide significance" and property owner notification. Table 3-1 on the next two pages lists the historic structures and sites that played a part in the growth and development of the Bend urban area.

Table 3-1
Inventory of Historic Sites in the Bend Urban Area

HISTORIC STRUCTURES	LOCATION
H. E. Allen House	875 Brooks Street
Bend Athletic Club Gymnasium✶	520 NW Wall Street
Bend Railroad Depot	1160 NE Division Street
Bend Water & Light Co. Powerhouse/dam	Foot of Vermont Street
Bend Woolen Mill	1854 NE Division Street
Charles Boyd Homestead✶	20410 Bend River Mall Drive
Cozy Hotel	327 NW Greenwood Avenue
Deschutes County Library Building✶	507 NW Wall Street
Delaware Grocery	845 NW Delaware Avenue
Downing Hotel	1033 NW Bond Street
Trinity Episcopal Church✶	469 NW Wall Street
First Presbyterian Church	157 NW Franklin Avenue
A.L. French Home	429 NW Georgia Avenue
Hoover's Universal Garage	124-128 NW Greenwood Avenue
Steidl and Tweet irrigation dam	Division St. near Yale Avenue

Table 3-1
Inventory of Historic Sites in the Bend Urban Area

HISTORIC STRUCTURES	LOCATION
Kenwood School	701 NW Newport Avenue
Keyes House	912 NW Riverside Boulevard
Liberty Theatre	849-851 NW Wall Street
Lucas House	42 NW Hawthorne Avenue
Thomas McCann House✶	440 NW Congress Street
Mountain View (Mayne) Hospital	515 NW Kansas Avenue
August Nelson Building	838 NW Bond Street
Niswonger House	44 NW Irving Avenue
O'Donnel Building	921-933 NW Wall Street
Old Clinic	731 NW Franklin Avenue
Old Bend High School Building✶	520 NW Wall Street
O'Kane Building✶	115 NW Oregon Avenue
George Palmer Putnam House	606 NW Congress Street
Pierson Blacksmith Shop	211 NW Greenwood Avenue
A. J. Tucker Blacksmith Shop	200-202 NW Greenwood Avenue
James E. Reed House	45 NW Greeley Avenue
Reid School✶	129 NW Idaho Avenue
Evan A. Sather Home✶	7 NW Tumalo Avenue
Sawyer House	434 Drake Road
St. Francis Catholic Church	494 NW Lava Road
Shevlin-Hixon Executive House	545 NW Congress Street
N.P. Smith Pioneer Hardware Building✶	935-937 NW Wall Street
Spheir Building	901 NW Bond Street
Stover House✶	1 Rocklyn Road
Old U.S. Post Office✶	777 NW Wall Street
John I. West Building	130 NW Greenwood Avenue
Wright Hotel✶	215 NW Greenwood Avenue
Nels and Lillian Andersen House	63160 Nels Anderson Road
SITES DESIGNATED WITH PLAQUES	**LOCATION**
1813 Rock	129 NW Idaho Street
Bend School Landmark	Drake Park
A.M. Drake Homesite	Drake Park
Foley Landmark	Pilot Butte State Park
Johns Landmark	Drake Park
Oregon Trunk Freight Warehouse Site	Railroad tracks & NW Division
Pilot Butte Inn Site	1133 NW Wall Street
Shevlin-Hixon Mill site	Shevlin Center near dam
Central Oregon Pioneers' Landmark	Pioneer Park
Weist Homesite Landmark	1315 NE Third Street
Brooks Scanlon Craneshed Site	721 SW Industrial Way

✶ Sites on the National Register of Historic Places

The items in Table 3-1 represent the city's official list of historic places compiled by the city and county, and approved by the Oregon Land Conservation and Development Commission. Any land use action or building modification to the historic structures on the approved list must be reviewed and approved by the joint city/county Historical Landmarks Commission, a citizens committee established in 1980.

Additional information and evaluation of historic sites is contained in resource material available at the city and county planning departments, the Des Chutes Historical Center, and in rules adopted by the state Land Conservation and Development Commission.

Cultural Amenities

Central Oregon's abundance of scenic and recreational amenities is complemented by a rich and diverse cultural climate of theater, music, and art in Bend. Performing arts can be seen throughout the year at the *Community Theatre of the Cascades* in downtown Bend. The Community Theatre has been putting on professional caliber productions since the early 1980s. In addition, the Central Oregon Community College *Magic Circle Theatre* is the venue for both college and community programs. In 2004, the community sponsored a renovation of the downtown *Tower Theater* building so that it can be used for lectures, concerts and other community events.

Bend is home to the Les Schwab Amphitheatre, an independent outdoor amphitheater that was built in the historic Old Mill District in 2001 that hosts riverfront concerts and events throughout the year. The Munch & Music series of evening concerts in the park during the summer is another opportunity for the community to gather together to enjoy free music, fine food, and friends in beautiful surroundings. The community college Central Oregon Symphony, jazz band, and choir perform several times a year for area residents.

The visual arts are represented with public art on street corners, at public buildings, and through exhibits at several public and private galleries in downtown Bend and elsewhere in the community. Several times each year the downtown merchants sponsor "Art Hops" when painters, sculptors, weavers and other artisans demonstrate their craft in the downtown stores. In addition to these amenities, the community supports other cultural events to celebrate cultural and ethnic diversity in Central Oregon.

Just south of the urban area is The High Desert Museum, a nationally renowned, living, participatory museum with a wide variety of indoor and outdoor exhibits on nature, art, science, pioneer life, and Native American life on the high desert plateau. The museum also offers a year-round education program of classes, lecture series, and field excursions.

Commented [QK1]: The community sponsored renovation was completed in 2004.

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Deleted: re is also interest in the community to renovate

Deleted: Bend hosts one of the state's leading music festivals in Drake Park along the banks of the Deschutes River. Each summer the Cascade Festival of Music presents ten days of classical, pops, and jazz concerts that draws in performers and visitors from all over the country.

Park and Recreation Facilities

The City of Bend has a long history of park development, beginning with the creation of Drake Park in 1921. Drake Park, the first of several parks along the Deschutes River, has become part of the identity and heart of the community. For decades Bend's citizens and visitors have enjoyed the many parks for their beauty, for sporting events, for community celebrations, and for casual recreation.

Since 1974 all of the public parks and recreation facilities within the urban area have been developed and managed by the Bend Park and Recreation District, a separate special district that serves an area slightly larger than Bend city limits. The Bend Park and Recreation District's *Comprehensive Plan* includes an inventory of existing parks, trails and recreation facilities, and establishes a framework for developing future parks, trails and recreation facilities based upon the community's needs.

Figure 3-2, Providence Neighborhood Park

The Bend Park and Recreation District also provides a large and diverse variety of recreation and fitness programs. These programs offer a wide range of year-round activities for youngsters and adults. One set of programs, in cooperation with the local school district, provides after school activities and sports for school students.

There is strong community interest in adding more parks, trails and recreation facilities to meet the ever increasing needs created by the expanding urban population. The Bend Park and Recreation District *Comprehensive Plan* describes the District's priorities for future projects.

The Bend Comprehensive Plan recommends the development of a trail system along the river wherever possible in an effort to provide public access to this outstanding natural feature. The park district already manages the Deschutes River Trail through town, and is working with property owners to extend the trail outside of city limits. Several miles of riverfront trails also exist on private property, but are open to the public. In addition to the river trails, the Bend Comprehensive Plan recommends a system of recreation and transportation trails, which would interconnect neighborhoods, parks, and schools. More information on the urban area trails and a map of the trail system are included in Chapter 7, *Transportation System.*

The Bend Comprehensive Plan also supports and recommends a park and recreation system that serves the community and takes advantage of natural sites within the area. There are many opportunities for new parks to be developed in conjunction with future school sites. The Bend Park and Recreation District, the Bend-La Pine School District, and the city and county work together to coordinate the planning of park and school facilities to serve the growing urban population.

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Deleted: The Bend Metro Park and Recreation District has almost three dozen park sites in the urban area, and more than 900 acres of park land in the urban area. The older neighborhoods in the west and central part of the urban area are generally well represented with parks that were developed before the 1970s. The parts of the urban area that experienced rapid residential growth in the 1990s have few developed park sites, although the district does have undeveloped park land on the east and north side of the urban area. In addition to the local park and recreation district facilities, Pilot Butte State Park—a volcanic cinder cone in the center of town with a commanding view of the urban area—is a favorite spot for residents and visitors.¶

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<#>acquisition of riverfront park land and/or conservation easements;¶
<#>preserving and expanding the public and private trail system along the Deschutes River and Tumalo Creek; and¶
<#>¶
<#>development of neighborhood parks.¶

Deleted: <#>2½ mile River Run trail at the north end of the urban area

Deleted: <#>develop other river trail segment

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A park facility located adjacent to a school has essentially the same service area as the school, and this approach to park planning has several advantages. The combined school and park make a year- round center for educational and recreational activities and allow each facility to be designed to complement the needs of both the park district and the school district. The coordinated school-park program may also afford an opportunity for cost savings to both districts. Besides eliminating some duplicate facilities, the coordination of siting new schools and parks could reduce the cost of acquisition, development, and maintenance of each type of facility.

The *Bend Park and Recreation District Comprehensive Plan* includes a map and inventory of the Park District's existing and planned parks, trails, and recreational facilities, and should be referenced for information on those facilities.

Existing developed and undeveloped park and recreation sites are shown on the Bend Comprehensive Plan Land Use Map. The City works with the Bend Park and Recreation District to update the Comprehensive Land Use Map as the District plans for new parks and facilities.

Until the 1998 update of the Comprehensive Plan, neither the city nor the county had a separate zoning district designed to protect and enhance parks and public open space. The city and county now have a Public Facilities plan designation that is applied to developed park facilities, schools, public owned natural areas, and other types of open space.

In addition to the public recreation facilities provided by the Bend Park and Recreation District, there are four private golf courses within the Urban Growth Boundary, and two more just outside the Urban Growth Boundary. Four of the courses within the urban area are currently open to the public. Besides providing recreational opportunities for residents and visitors, these golf courses serve a secondary role of providing some of the "large developed" open space within the urban area.

Public Education

The sections below describe the existing and planned public education facilities in the urban area. In addition to the public school system, there are several private and parochial schools that provide elementary and secondary education.

The Bend-LaPine School District

The Bend-La Pine School District is the only public school district serving the urban area. At the end of the 1990s, the district operated nine elementary schools, three middle schools, two high schools, and several small special "magnet" programs within or adjacent to the Urban Growth Boundary. These schools serve the Bend urban area and several thousand households outside the urban area. Roughly two-thirds of the students in the Bend schools are from within the urban area. In addition to the Bend

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Deleted: 3-2 on the next page provides a summary of the area's existing public park and recreation facilities managed by the park district and Oregon State Parks (as of 1996). The number and type of facilities planned by the Bend Metro Park and Recreation District through 2005 are also listed in the table.

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Public Park and Recreation Facilities in and near the UG

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Deleted: has described the types and number of new facilities it thinks the community needs to develop during a ten-year period ending in 20052028. Because the long-term, 2010-year park and recreation needs and corresponding locations have not yet been determined, the Comprehensive Plan Land Use Map displays a symbol that represents the general location for future parks in those neighborhoods where a specific site has not been selected. As the Bend Metro Park and Recreation District updates its *Comprehensive Management and Development Plan* with new information on neighborhood parks or other facilities, the general symbol for future park sites on the Land Use Map will be replaced with specific demarcations.

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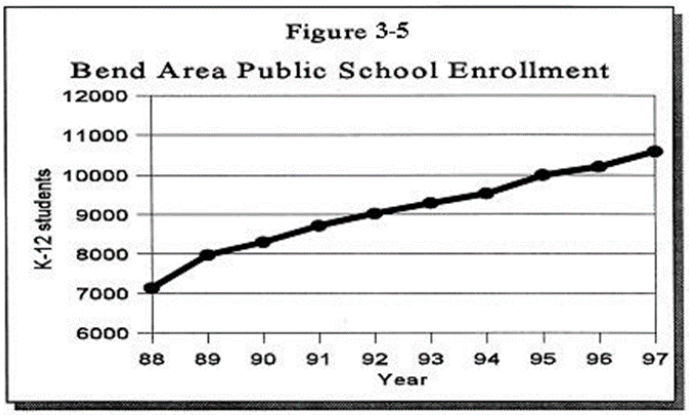
schools, the district has schools in Sunriver and La Pine that served about 1,650 students in 1997.

During the high growth period of 1988 through 1997, enrollment in the Bend schools increased almost 48 percent. This dramatic increase in students is another indicator that the majority of people moving to Central Oregon are not elderly, but younger families with school age children. Figure 3-5 shows the increase in total enrollment in the Bend schools for the ten year period ending in 1997.

Figure 3-5



Source: Bend-LaPine School District

In the early 1990s the Bend-La Pine School District constructed two elementary schools and one middle school to meet the rapid population growth. These new schools were above or near their maximum enrollment capacity within a year or two after they opened. Table 3-3 below compares the student load in 1997 with the design capacity of each school.

Table 3-3
Bend Urban Area Public School Facilities

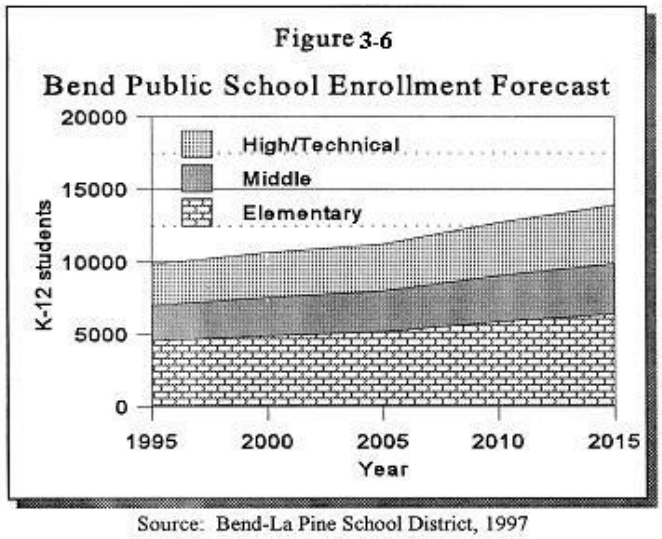
Facility Name	Grades	Site Acres	Number of Classrooms	Maximum Enrollment	Enrollment in 10/97	Percent of Capacity
Bear Creek Elem.	K-5	37.40	25	681	571	84%
Buckingham Elem.	K-5	20.50	24	662	634	96%
Elk Meadow Elem.	K-5	13.00	24	650	702	108%
Jewell Elementary	K-5	16.74	24	675	596	88%
Juniper Elementary	K-5	30.41	24	675	551	82%
Kenwood Elem.	K-5	4.17	17	423	80	90%
Kingston Elementary	K-3	3.00	9	166	192	116%
Lava Ridge Elem.	K-5	40.00	24	650	671	103%
Thompson/Amity Creek Elementary	K-3	1.40	8	156	272	174%

Facility Name	Grades	Site Acres	Number of Classrooms	Maximum Enrollment	Enrollment in 10/97	Percent of Capacity
Cascade Middle	6-8	34.37	38	757	755	100%
High Desert Middle	6-8	85.00	39	800	869	109%
Pilot Butte Middle	6-8	33.13	39	825	963	117%
Bend High	9-12	68.00	72	1432	1528	107%
Mountain View High	9-12	30.00	62	1322	1730	131%

Source: Bend-La Pine School District. Acreage figure may include additional land held by the district. Classroom number includes modular units.

In October 1997, the school board accepted a school siting study prepared for the district in cooperation with the city and county. This study provides information on enrollment, siting needs, and other factors to help the district determine the type, location, and size of school sites needed during the next 20 years.

The school district's estimate of future enrollment levels and school needs is based on the forecast population levels in the urban area and nearby rural lands.



Source: Bend-La Pine School District, 1997

Figure 3-6 shows the 1995 student levels and the forecast enrollment level for the public schools based on the 1997 siting study. It can be seen from the data in this figure that total enrollment in the Bend area public schools is expected to increase about 45 percent by the year 2015.

If the population growth and demographic patterns follow the forecasts in the 1997 study, there will be a need for three to five additional elementary schools, two to three new middle schools, and one or two new

senior high schools or technical schools in the planning area by 2015. In 1998 local voters approved a $57 million bond levy to help meet the need for more schools. The bond will pay for construction of a new elementary school, a new middle school, a new high school and remodeling Bend High.

Identifying the location for new public schools is an important function of the Comprehensive Plan. The need for new schools is closely related to residential development and housing densities in the community. It is extremely important that schools be located with reference to the development pattern indicated on the Comprehensive Plan.

Elementary schools in particular can have a significant influence on the location or direction of growth in any given area, and will in themselves attract residential development. They should be centrally located in their service area, and spaced in a way that will permit reasonable locations for future schools as the area continues to grow. The city, county and Bend-La Pine school district will use the most recent studies to evaluate ways to ensure the timely development of new schools in the urban area.

Colleges and Universities

Central Oregon Community College is the state's oldest two-year college, having been created in 1949. Located on the west slope of Awbrey Butte, the 200 acre campus features a 102 student residence hall, a 38,000 volume college/community library, a 300-seat performing arts center, and several lecture halls. The college has a long-standing policy to encourage community use of its buildings and facilities.

The college enrolls about 3,200 full-time and part-time students each term, plus another 3,000 to 4,000 community education students taking non-credit courses. Degrees offered by COCC include the Associate of Arts degree, the Associate of Science degree, and the Associate of Applied Science degree covering several technical and professional fields. The college serves more than just the Bend area, and its instructional programs extend to a 10,000 square mile service area through a network of community centers in Christmas Valley, La Pine, Madras, Prineville, Redmond, Sisters, and Warm Springs.

OSU-Cascades, a branch campus of Oregon State university opened its doors in 2001 on the COCC campus. OSU-Cascades expanded to a four-year university when it welcomed its first freshman class in 2015.

POLICIES

Historic Sites

3-1 The City encourages the preservation, rehabilitation, and reuse of historic structures whenever practical.

3-2 The City will continue to encourage identification and preservation of significant historical and cultural sites.

3-3 The preservation of exterior facades should be the emphasis of the City's encouragement of historic preservation.

3-4 The City encourages public educational institutions to promote the importance of Bend's history and historic landmarks.

Parks and Recreation Facilities

3-5 The City will apply a new "Public Facilities" zone for public parks and recreation facilities within the planning area.

3-6 The City shall support efforts by the Bend Park and Recreation District and Bend-La Pine School District to jointly develop school-park sites to meet park and school recreation needs.

3-7 Sites for small neighborhood parks are not shown on the Land Use Plan Map, but the city shall encourage private or public parties to develop small neighborhood parks.

3-8 The City shall refer to the Bend Park and Recreation District, for its review and recommendations, all development proposals that include or are adjacent to existing or proposed parks or trails. Development proposals include, but are not limited to, master plans, land divisions, and replats.

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Commented [QK7]: The City also refers all master plans, subdivisions, partitions and replats to BPRD.

Commented [DS8R7]: I think the way Policy 3-8 is phrased captures all of the land use applications referred to above. That said, I added some text to clarify that the applications she referred to in her comment would be covered by this policy.

Urban Trails

3-9 The City will continue to work with the county, irrigation districts, state and park district to develop a series of trails along the Deschutes River, Tumalo Creek, and the major canals so that these features can be retained as an asset in the urban growth boundary and urban reserve area.

3-10 The trails designated on the Bicycle and Trail System map shall be the basis for developing a trail system that serves the recreational and transportation needs of the community.

3-11 The City, when practical, shall require connecting links to the urban trail system from all adjacent new developments.

Schools

3-12 The City will plan for safe streets, pedestrian, and bike facilities adjacent to the school sites as new schools are erected.

3-13 The City will coordinate with the Bend La-Pine School District to increase pedestrian and bicycle accessibility to schools.

3-14 When legally allowed, the City may require major new developments to reserve land for school purposes in conjunction with the Bend-La Pine School District's adopted plan for the type and location of future facilities.

Chapter 8: Public Facilities and Services

Adopted Amendments

EFFECTIVE DATE	ORD #	CHANGES
November 1998	Resolution #2247	Comprehensive Plan Update
January 5, 2009	NS-2112	
April 3, 2013	NS-2194	Add Water PFP
December 17, 2014	NS-2230	Add Sewer PFP
December 6, 2016	NS-2771	Format update, minor text changes to remove outdated text
September 19, 2018	NS-	Update to reflect changes from 2018 Collection System Public Facility Plan

BACKGROUND

Context

Consideration of the public and private facilities and services within the Bend Urban Growth Boundary is an important focus of the Plan. Several of these services — water, sanitary sewers, energy supplies, and communications — are the backbone needed to support and encourage urban level development. Other urban services such as refuse disposal, emergency services, and storm water disposal are also necessary parts of the mix of urban services. Although most of these facilities and services have a planning horizon greater than 20-years, they are still driven by the population and land use needs forecast in the Plan.

Goals

Adequate public facilities are the key to efficient and stable urban development. The goals below provide general guidance for maintaining and improving the level and quality of urban services as growth occurs in Bend. The citizens and elected officials strive:

- To have public and private utility systems provide adequate levels of service to the public at reasonable cost;
- For the city, county, and special districts to coordinate the provision of adequate urban services in an efficient and timely manner to support urban development;
- For new development to pay its fair share of the cost of major facilities needed to support development;
- To ensure that public services will not negatively impacts on the environment or the community; and
- To locate and operate public buildings and other public facilities to best serve the needs of the residents.

Overview

The Public Facilities and Services chapter describes existing facilities and utilities in Bend and also describes what city facilities are needed to meet projected growth. The listing of city water and sewer projects planned for and expected over the next twenty years provides a framework for decisions on when, where, and how public facilities will be provided to support the projected growth. The city will use the listing of projects as a basis for its annual capital improvement budget.

Sewer Collection Systems Facilities

The City adopted a public facility plan for sewer collection by Ordinance No. 2111 in 2009. The plan was based on the city's 2007 Collection System Master Plan and identifies future improvements to the sewerage collection facilities required to serve long range growth in Bend. However, the city's 2009 Public Facility Plan adopted by

the City Council was never acknowledged by the state. The State did acknowledge the 2008 public facility plan for the Water Reclamation Facility, also known as the wastewater treatment plant, through Order 001795 in 2010.

In response to the ~~2008~~ 2010 UGB Expansion Remand, the City began a comprehensive planning process to update the previous Collection System Master Plan developed in 2007. This planning effort has built on information from the previous master plan, leveraged improvement concepts and utilized system information collected and analyzed in that report. The adopted and acknowledged 2014 Collection System Public Facility Plan replaces the 2009 Public Facility Plan and provides guidance and sound stewardship of the City's sewer collection system for the 2013 – 2033 planning period.

In October 2016, the Bend City Council approved a number of amendments to the Bend Comprehensive Plan, including an expansion of the Bend UGB to add 2,380 acres of land. The City Council also adopted amendments to the Comprehensive Plan and Development Code to allow more development and redevelopment in certain area within the existing UGB that are referred to in Chapter 11 as Opportunity Areas. The Oregon Department of Land Conservation and Development (DLCD) approved these plan and land use regulation amendments, including the UGB expansion, in December 2016.

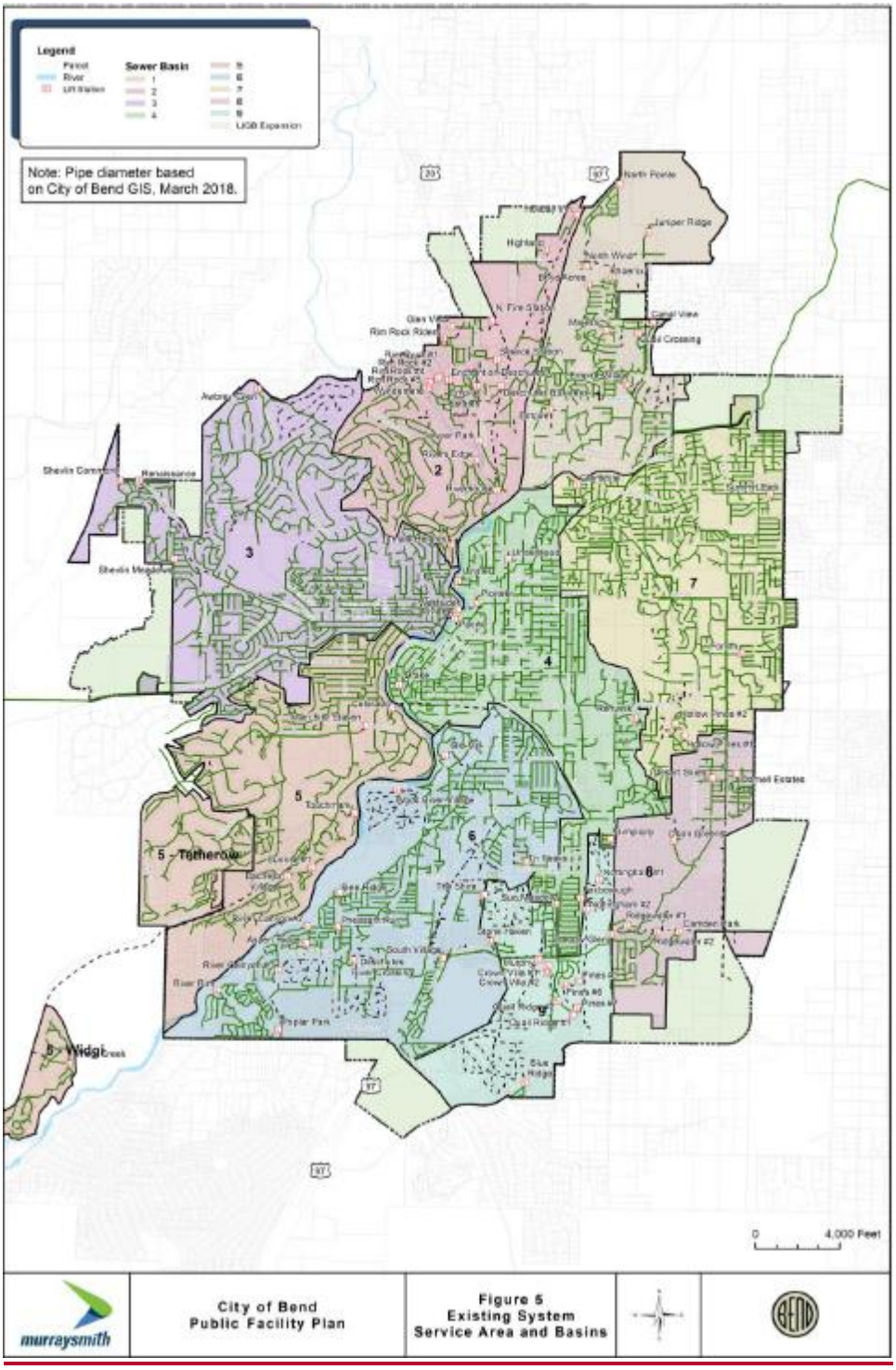
In 2017, the City began work to update the Public Facility Plan for the sewer collection system (CSPFP) to reflect those improvements that would be needed to serve the entire UGB, development in the Opportunity Areas, and those projects that were identified to serve the Expansion Areas included in the 2016 UGB expansion. This update also included making changes to two interceptor projects. These projects included the East Interceptor, a former segment of the Southeast Interceptor now identified as its own project, and the North Interceptor. The City adopted changes to the CSPFP to reflect revised alignments and pipe sizes for these projects. The City Council adopted the amended Collection System PFP in 2018 to include these projects to support development in the Opportunity Areas and the Expansion Areas.

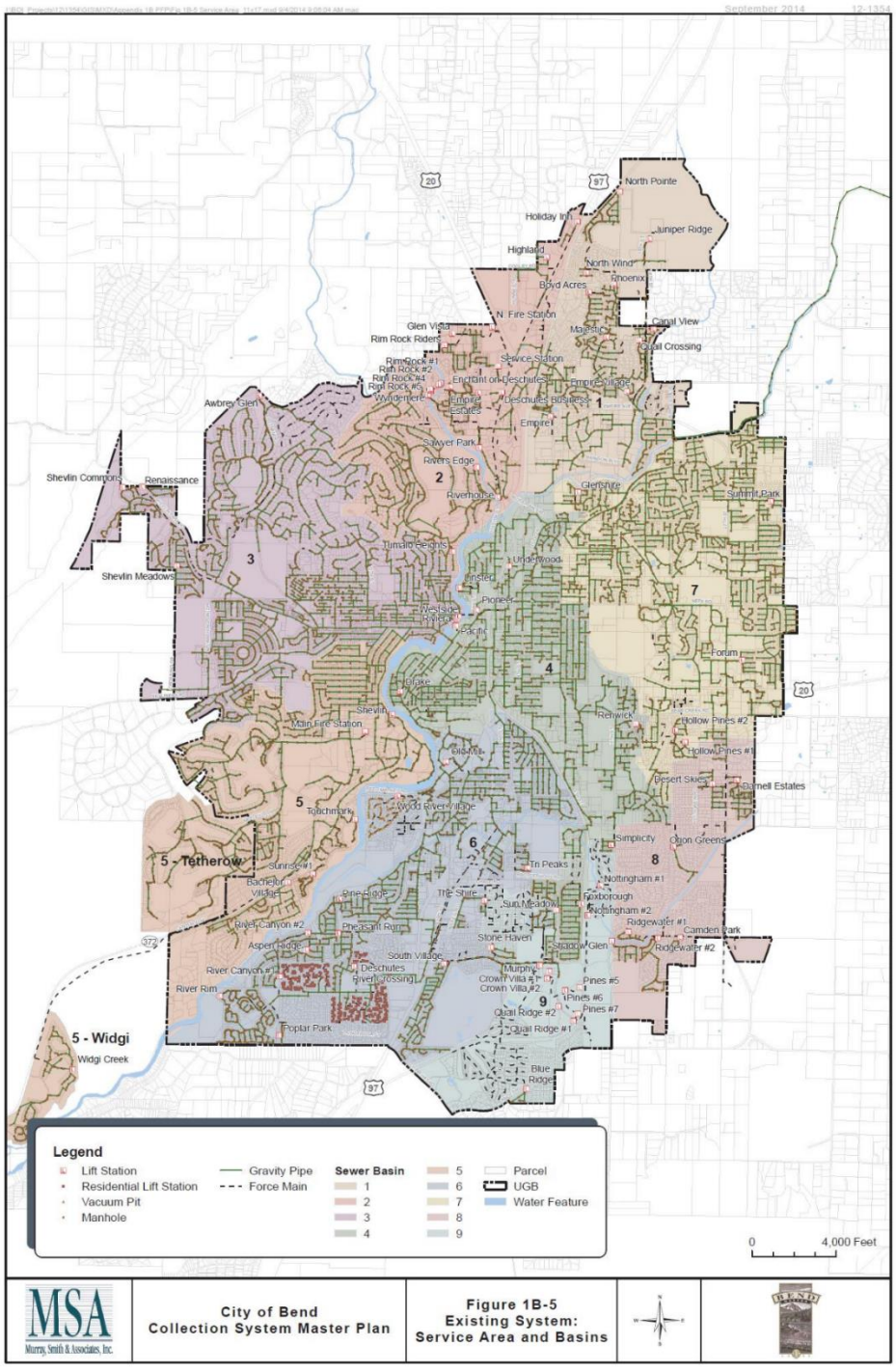
Service Area

The collection system service area includes all areas within the city limits of Bend and the Urban Growth Boundary that are either currently served by the City's wastewater collection system or will be served by the system within the 20-year planning period. To determine the future development projections within the UGB, the City relied upon and applied the adopted Comprehensive Plan designations.

The City's Collection System Public Facility Plan separates the primary collection system into nine major sewer basins covering the approximate ~~35~~ 37 square miles of the UGB. These nine major sewer basins are further sub-divided into several smaller sewer sub- basins for the purpose of determining flow capacity. The wastewater analysis and future forecasts consider existing customers, future customers and the conversion of septic to sewer connections within the UGB. There are currently 3,103 residential units and 158 non-residential acres that are served by a County permitted septic system within the UGB. Within the 20-year planning period it is assumed that these residential units and non- residential acres will redevelop and/or connect to the city's collection system.

Figure 8-1 – Municipal System, Service Area, and Basins




Legend
Lift Station
Residential Lift Station
Vacuum Pit
Manhole
Gravity Pipe
Force Main
Sewer Basin
1
2
3
4
5
6
7
8
9
Parcel
UGB
Water Feature
0
4,000 Feet
MSA
Murray, Smith & Associates, Inc.
City of Bend
Collection System Master Plan
Figure 1B-5
Existing System:
Service Area and Basins

The City's primary wastewater collection system is generally comprised of manholes, gravity pipelines, City-owned lift stations and force mains that convey sewage to the wastewater reclamation facility through 249 miles of gravity pipe and 69 miles of force main and pressure sewer pipeline. Most of the gravity collection system was constructed in the late 1970's, when the City received federal funding to construct a centralized wastewater treatment plant. The City completed its sewerage collection system and treatment plant in 1983. Since that time a number of upgrades have occurred in both the plant and collection system. The wastewater treatment plant has capacity for an average flow of approximately seven million gallons a day. Table 8-1 charts the average daily flows at the wastewater treatment plant and shows a gradual increase of the average daily flow. The flow data includes seasonal wet weather events.

Table 8-1
Annual Average Flow from Historical Records at the WRF

Year Average Daily Flow	Year Average Daily Flow
2007	5.41
2008	7.22
2009	5.6
2010	5.5
2011	5.3
2012	5.4
2013	5.91

Notes:
1) 2007 and 2013 average calculated from flow meter data (2-month period).
2) Suspected error in inflow data at the WWTP. Inflow meter was recalibrated after 7/20/2009.

The master plan for the wastewater reclamation facility (WRF) was completed in 2008 by Carollo Engineering. The plan for the WRF was submitted to the Department of Land Conservation and Development in 2009. The Land Conservation and Development Commission (LCDC) acknowledged the 2008 plan for the WRF through Order 001795 in November 2010. The WRF Master Plan identifies short term and long term capacity improvements that will enable the City of Bend to minimize expansion costs by fully utilizing the existing facilities. The 2014 Collection System Public Facilities Plan proposes improvements to increase the capacity of the collection system to 11.9 MGD within the 20- year planning period. The design of the WRF was completed in 2012, with construction beginning in the summer 2013. The City expects the WRF expansion to be completed by 2019. The 2018 CSPFP includes improvements necessary to serve the entire UGB, including specific improvements necessary to provide wastewater collection to the areas added to the UGB in 2016.

Optimization

The City utilized an optimization process to determine the combination of system improvements that would satisfy hydraulic performance criteria and minimize overall life- cycle costs. The optimization model enables an exhaustive and objective evaluation of feasible collection system improvement alternatives. The optimization software, Optimizer WCSTM, is a decision-support software program that integrates improvement alternatives, comprehensive life-cycle costs, design criteria and the calibrated hydraulic model of the collection system. In a single optimization analysis, the software evaluates

over 100,000 possible solution configurations and assesses life-cycle cost and hydraulic performance simultaneously while sizing system improvements. Over the course of this project, over one hundred individual optimization runs were completed, representing a total analysis of more than 10 million trial solutions.

The optimization process identified short-term and long-term capacity upgrade projects to be phased over the 20-year planning period.

Capital Improvement Program

The Capital Improvement Program (CIP) describes proposed improvements that are required in both the short-term (1-5 year), mid-term (6 to 10 years) and long-term (~~6 to 10 years and~~ 11 to 20 years) to provide reliable sewer collection throughout the City's current UGB.

~~In response to existing and future hydraulic deficiencies, condition deficiencies and other operational issues identified by O&M staff,~~ The 2018 update to the CSPFP organized improvement projects by whether they were:

- Short Term (1 to 5 years);
- Short to Mid Term Projects (Development Driven and needed 1 to 5 or 6 to 10 years),
- Mid to Long Term (Development Driven and 6 to 10 or 11 to 20 years).
- Expansion Area Service (Development Driven)

For consistency with Goal 11 and its administrative rule, projects needed between 1 to 5 years are considered short term, and projects needed between 6 years and the remainder of the planning period are considered long term.

Projects were further organized in the following categories:

1. Trunk Sewer and Interceptor Improvements
2. Southeast Lift Station Condition and Decommissioning Improvements
3. South Lift Station Capacity and Condition Improvements impacting the Amethyst/Mahogany/3rd Street Trunk Sewer
4. Other South and East Area Lift Station Improvements
5. Central Area Lift Station Capacity and Condition Improvements
6. West Lift Station Capacity and Condition Improvements impacting the Newport Avenue Trunk Sewer
7. North Lift Station Condition and Decommissioning Improvements
8. Other North Area Lift Station and Condition Improvements
9. Programmatic Funding
10. Expansion Area Infrastructure

The final category of improvements refers to those needed to serve development and land uses in several of the UGB expansion Areas. The following organization of projects into short-term, short to mid-term, and mid to long term reflects the presentation in the 2018 CSPFP. Figure 8-2 provides a map that identifies the locations of these key projects. The 2018 CSPFP provides a written description for each project as well.

~~**there are several major projects that the City should undertake in the short-term (1 to 5 years).**~~ **Short Term Projects.** The major projects recommended in the 1 to 5-year timeframe include:

1. North Interceptor Phase 1
2. Southeast Interceptor Extension and Diversion
3. Southeast Lift Station Decommissioning
4. Drake Lift Station and Force Main

Short to Mid-Term Projects (Development Driven). These projects are driven by development location and timing, and are identified as needed between the short-term (1 to 5 years) and mid-term (6 go 10 years).

1. Amethyst/Mahogany/3rd Street Trunk
2. River Rim Lift Station
3. 8th to 15th Street Trunk
4. Newport Trunk, Shevlin Commons Lift Station, Shevlin Meadows Lift Station and Force main, and Renaissance Lift Station
5. Deschutes Business Lift Station
6. North Interceptor Phase 2
7. North Area Lift Station Decommissioning
8. North Interceptor Phase 3
9. Old Mill Lift Station and Force main
10. East Interceptor Phase 1

Mid to Long Term Projects (Development Driven). The following projects are also development driven and identified as needed in the mid (6 to 10 years) to long term (11 to 20).

1. Drake Downstream Trunk
2. Central Interceptor
3. East Interceptor Phase 2

Expansion Area Service. The final list of projects is those intended to support development in several of the UGB Expansion Areas. The 2018 CSPFP identifies several large projects, such as the North Interceptor Phases 2 and 3, and East Interceptor Phases 1 and 2, that are needed for both UGB Expansion Areas and for accommodating wastewater flows to the WRF. This list of projects is specific to several UGB Expansion Areas and will likely be needed in the Short Term (1 to 5 years).

1. Elbow Gravity Trunk
2. Elbow Lift Station and Force main
3. DSL Gravity Trunk
4. Thumb Gravity Trunks
5. West Gravity Trunks

Table 8-2 presents the capital improvement program cost summary~~Below is the list of short-term projects and estimated project cost~~ in ~~2013~~ 2017 dollars by project category.

Table 8-2
Capital Improvement Program Cost Summary

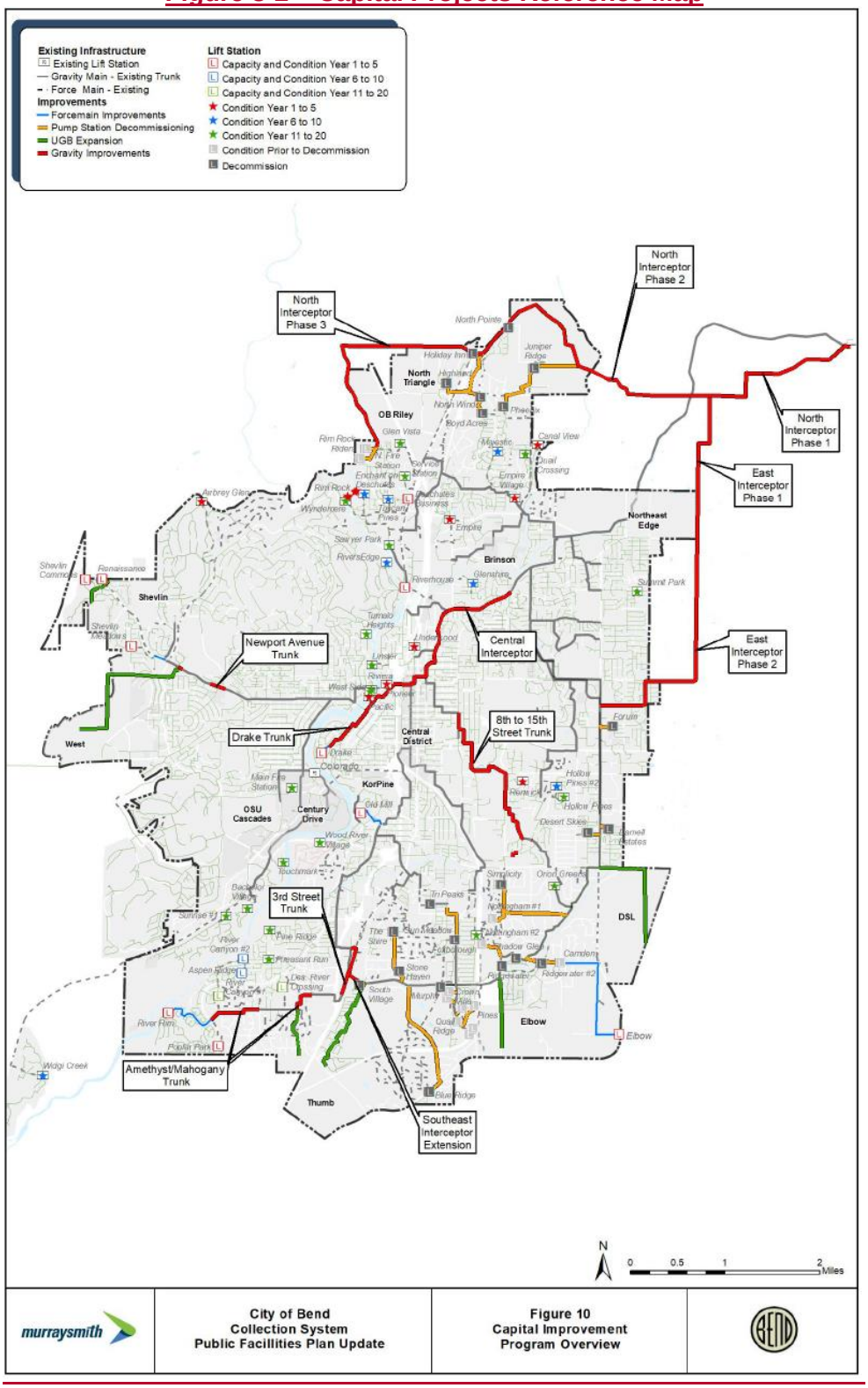
Improvement Category	Year 1 to 5	Year 6 to 10	Year 11 to 20	Total
Trunk Sewers and Interceptors	$33.1	$55.1	$29.9	**$118.1**
Southeast Lift Stations Condition and Decommissioning	$12.8	$0.6	$2.0	**$15.4**
South Lift Stations Impacting Amethyst/Mahogany/3rd Street Trunk Sewer	$2.0	$2.1	$0.8	**$4.9**
Other South and East Area Lift Station Condition Improvements	$0.4	$1.2	$4.0	**$5.6**
Central Area Lift Station Capacity and Condition Improvements	$7.7	$0.8	$2.8	**$11.3**
West Area Lift Stations Impacting Newport Ave Trunk Sewer	$2.5	$0.0	$0.1	**$2.6**
North Area Lift Stations Condition and Decommissioning	$0.0	$6.4	$2.0	**$8.4**
Other North Area Lift Station Capacity and Condition Improvements	$1.5	$0.8	$1.3	**$3.6**
Programmatic Funding	$20.1	$14.1	$47.7	**$81.9**
Expansion Area Infrastructure	$18.7	$4.3	$0.0	**$23.0**
Total	**$98.8**	**$85.4**	**$90.6**	**$274.8**

Notes:
1. All costs shown in millions and are Class 5 budget estimates established by the American Association of Cost Engineers.

~~There are also a number of recommended long-term (year 6 through build-out) improvement projects required to support anticipated increases in collection system flow within the existing UGB, provide service to unsewered areas, and to plan for ongoing system repair and replacement. Below are the primary long-term projects and the estimated project costs in 2013 dollars.~~

~~T~~The actual project costs will likely vary from the estimates presented. In addition, the project estimates will change over time due to fluctuations in actual labor and material costs, competitive market conditions, site conditions, final project scope, implementation schedule, continuity of personnel, and other unforeseeable factors. Because of these factors, project feasibility, benefit-to-cost ratios, risks and funding must be carefully reviewed prior to making specific financial decisions or establishing project specific budgets. The projects listed above as short term, short to mid-term, and mid to long-term are reflected in the following map identified as Figure 8-2. This figure also shows the location of the Expansion Area Projects.

Figure 8-2 – Capital Projects Reference Map



Sewer Collection System Financial Strategy
The City's financial strategy for the collection system considers the current and future financial obligations of the utility, operation and maintenance needs, fiscal policy achievement and the ability to support the completion of the capital projects identified in this CSMP update.

The overall goal of the financial plan is to have the annual water reclamation utility total resources (rates and fees) set at a sufficient level to meet annual uses (operations, maintenance, debt service, capital costs and fiscal policy achievement) to ensure a self-supported utility. The primary source of funding for the utility is derived from ongoing monthly charges for service, with additional revenue coming from miscellaneous fees/charges, interest income and system development charges (SDCs). The City Council controls and approves the level of user charges as needed to meet financial objectives. The financial plan considers the total system costs of providing water reclamation services, both operating and capital. The following elements were completed as part of the financial plan:

Capital Funding Plan. Identifies the total Capital Improvement Plan (CIP) funding obligations of the planning period. The plan defines a strategy for funding the CIP including an analysis of available resources from rate revenues, existing reserves, system development charges, debt financing, and any special resources that may be readily available (e.g., grants, developer contributions, public private partnerships, etc.). The capital funding plan impacts the financial plan through the use of debt financing (resulting in annual debt service) and the assumed rate revenue available for capital funding.

Operating Forecast. Identifies future annual non-capital costs associated with the operating, maintenance, and administration of the water reclamation system. Included in the financial plan is a reserve analysis that forecasts cash flow and fund balance activity along with testing for satisfaction of actual or recommended minimum fund balance policies. The financial plan ultimately evaluates the sufficiency of utility revenues in meeting all obligations, including cash uses such as operating expenses, debt service, capital outlays, and reserve contributions, as well as any debt service coverage requirements associated with long-term debt. The plan also identifies the future adjustments required to fully fund all utility obligations in the projection period.

Sewer Rates. The City Council approved the FY 2017-18 Resolution No. 3077 on June 21, 2017. This resolution included a change to the monthly sewer rate as follows:

- Single family residential base charge - $34.55:
- Multi-family residential base charge - $13.65:
- Non-residential standard base charge - $34.55.

For each of these categories of sewer rate charge, there is also a volume charge of $3.62 per 100 cubic feet of winter quarter average (WQA) water usage. In addition, the City Council has also implemented an extra strength charge (ESC) that will be phased in over four years, with the 2017-2018 representing the 2nd year of this phase in.

~~a nine percent rate increase effective on October 1, 2014. All monthly rates (monthly rate and volume rate) will increase uniformly by nine percent. Residential customers inside the city will pay a monthly rate of $48.36 per dwelling unit, and residential customers outside the city will pay a monthly rate of $49.82 per dwelling unit.~~ The financial plan indicates that ~~an additional 3.1 percent~~ rate increases of approximately 6% per year ~~increase~~ will be needed through FY 2021 to meet ~~the~~ current water reclamation utility rate revenue requirements. Annual inflationary rate increases are anticipated for the remainder of ~~within~~ the 20-year financial planning horizon. Actual rate increases may vary depending on timing and costs of projects. This projection assumes that the customer base grows by 1.4% per year.

System Development Charges.
SDCs are one-time fees imposed on new and increased development to recover the cost of system facilities needed to serve that growth. An SDC can include two major components:

- A reimbursement fee that reflects the cost of existing infrastructure with capacity that is available to serve growth
- An improvement fee that reflects the portion of the cost of future projects that is attributable to providing capacity for growth.

The financial plan ~~above assumes that the c~~includes the City's sewer SDC, and ~~remains~~ at its current ~~level~~ rate of $~~2,986~~4,655 per equivalent dwelling unit. The FCS Group completed the latest Sewer SDC study for the City in June 2015. This SDC study incorporated information from the 2014 CSMP and SPFP to support the calculation of the Sewer SDC of $4,655. The City Council approved the increase in the Sewer SDC to this amount in Resolution 3077 on June 21, 2017. ~~The City has recently initiated an SDC study, which will have a separate public process. That process is expected to begin late 2014 and be complete by June of 2015 and will incorporate all new information contained in this plan to determine the appropriate SDC and its implementation~~.

Water Facilities and Systems

The quality of water in the Bend urban area is a matter of major importance. Not only is water necessary for the needs of residential, commercial, and industrial users, but it supports many of the recreational and scenic opportunities that make the Bend area a desirable place to live.

In 2006, the city engaged in an update to the water system master plan to serve the existing urban growth boundary, the urban reserve area identified in this plan, and potential areas for future expansion of the UGB. This 2006 master plan followed the development and approval of a water management and conservation plan (WMCP) in 2004. The City relied on these documents, water planning documents from the Avion Water Company and Roats Water Company, and reports from the City Engineer updating information from the 2007 Water Master Plan to develop an updated Goal 11 water public facility plan (PFP) for the existing Bend UGB. This 2013 Water PFP is incorporated as the Goal 11 public facility plan for water and identifies the capital improvements needed to serve the existing and future development within Bend's UGB.

Municipal System

The City of Bend is one of three water suppliers within the UGB. The city's water system in 2006 included about 22,000 service connections. Since 1926, the City of Bend's main source of water has been from Bridge Creek in the Tumalo Creek watershed. Tumalo Creek originates on the eastern slopes of Ball Butte and Broken Top Mountain about 20 miles west of Bend in a protected watershed area, which lies within the Deschutes National Forest. Figure 8-2 shows the annual water use from 1998-2005 in acre feet. Figure 8-3 shows the annual water use pattern, using daily use data from 2005.

The Deschutes Watershed has excellent water quality, considering both chemical and bacteriological quality with only chlorination treatment. The water is a consistent 48°F winter and summer, and is clear with the exception of slight turbidity during period of high runoff from the watershed. These periods occur only occasionally, and last only a few days. The 1986 Safe Drinking Water Act required that all surface water systems in the nation provide filtration unless stringent watershed control, raw water quality and disinfection systems were met. In 1992 the city demonstrated sufficient evidence to meet the criteria, and obtained an exemption from the Surface Water Treatment Rules contained in the 1986 Act. The Bridge Creek source can deliver up to 13.5 million gallons per day. The City supplements the Bridge Creek source with deep groundwater wells. In 2006 the city had 21 wells on line to supplement the Bridge Creek source. These wells increase the delivery capacity of the city system to approximately 36 million gallons per day. In addition, the city has 28.0 million gallons of reservoir storage. The city's 475 miles of water distribution system is primarily composed of ductile iron pipe.

The city water system historically provided metered service for industrial, commercial, and multifamily developments. However, the city was one of the last major water systems in the state to use flat rate (non-metered) billing for residential service connections. As of December 2004, the City has become fully metered for all customers. This included conversion to automated meter reading technology, as well as installation of premise isolation cross connection protection at every service connection as part of our Safe Drinking Water Program. In 2004, the City updated its required Water Management and Conservation Plan which outlines various conservation related benchmarks, in order to meet conditions by the Oregon Water Resources Department as part of obtaining new water rights to meet the needs of growth.

The city's 2007 Water System Master Plan Update identifies water supply, transmission, and storage needs throughout the city's service territory within the UGB. Additional wells, reservoirs, main transmission lines, and smaller distribution lines will be needed to meet the projected urban area growth.

Figure 8-~~23~~

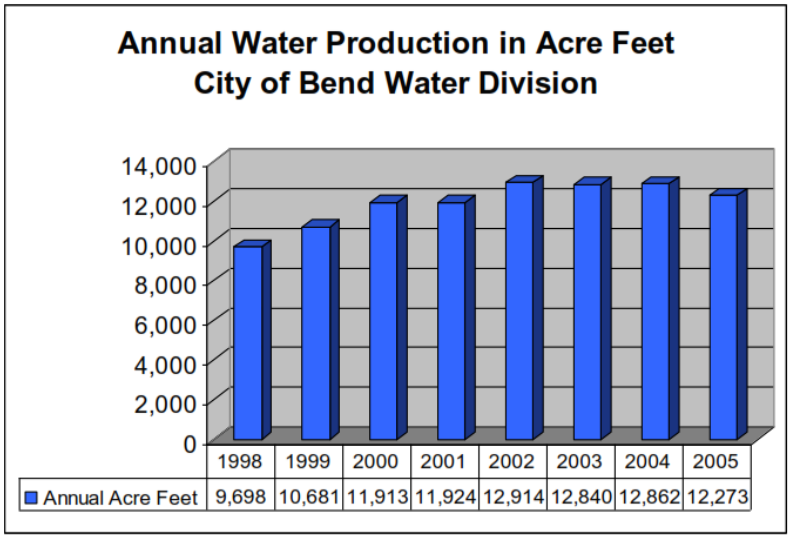


Figure 8-~~34~~

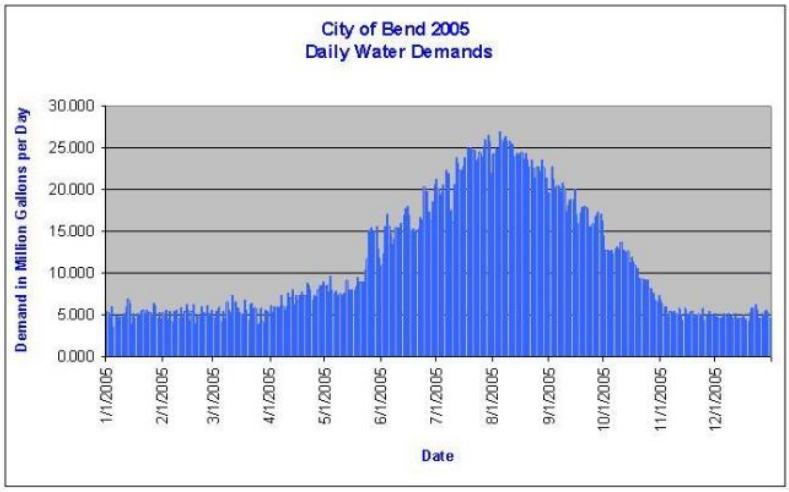
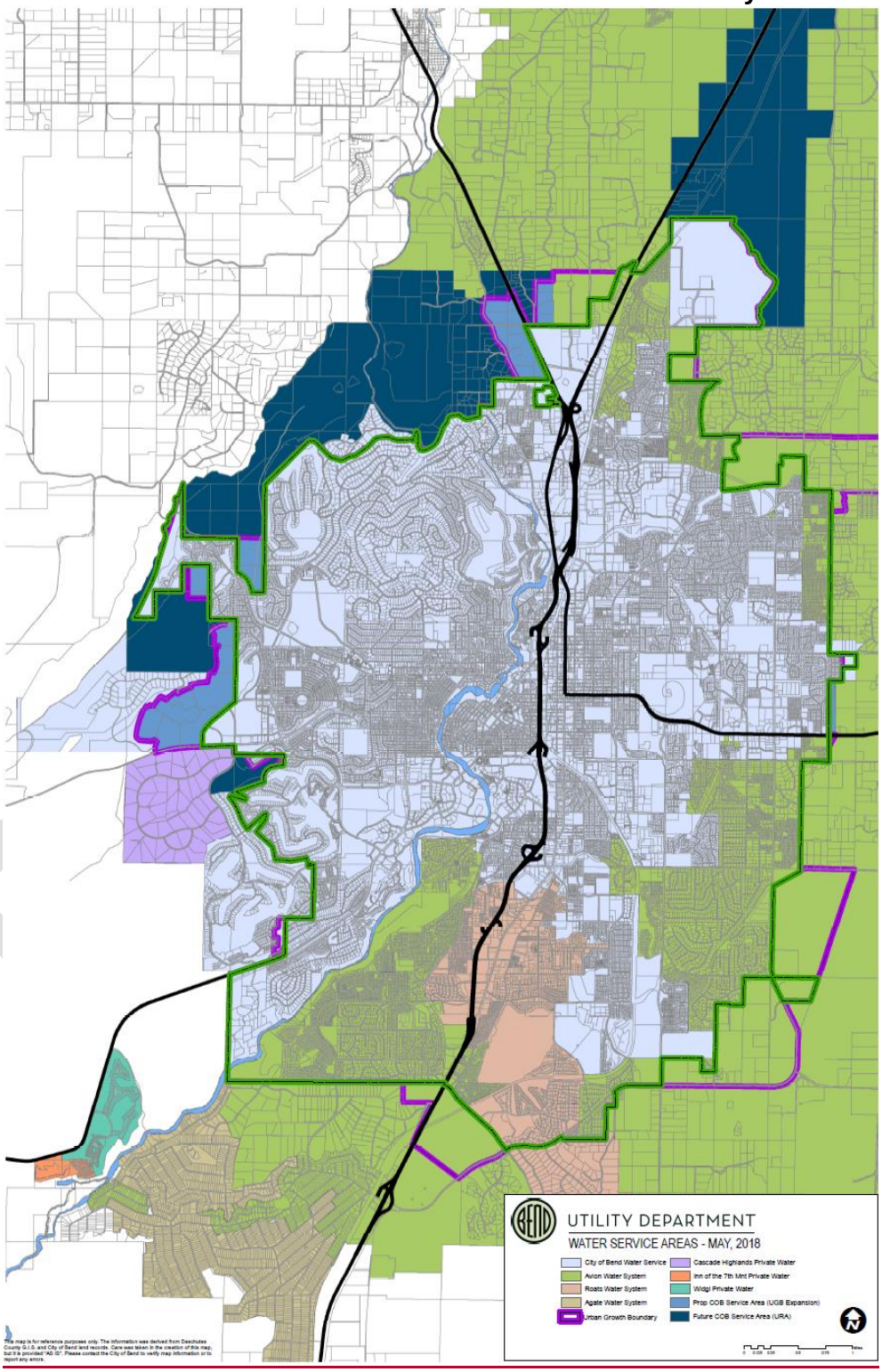
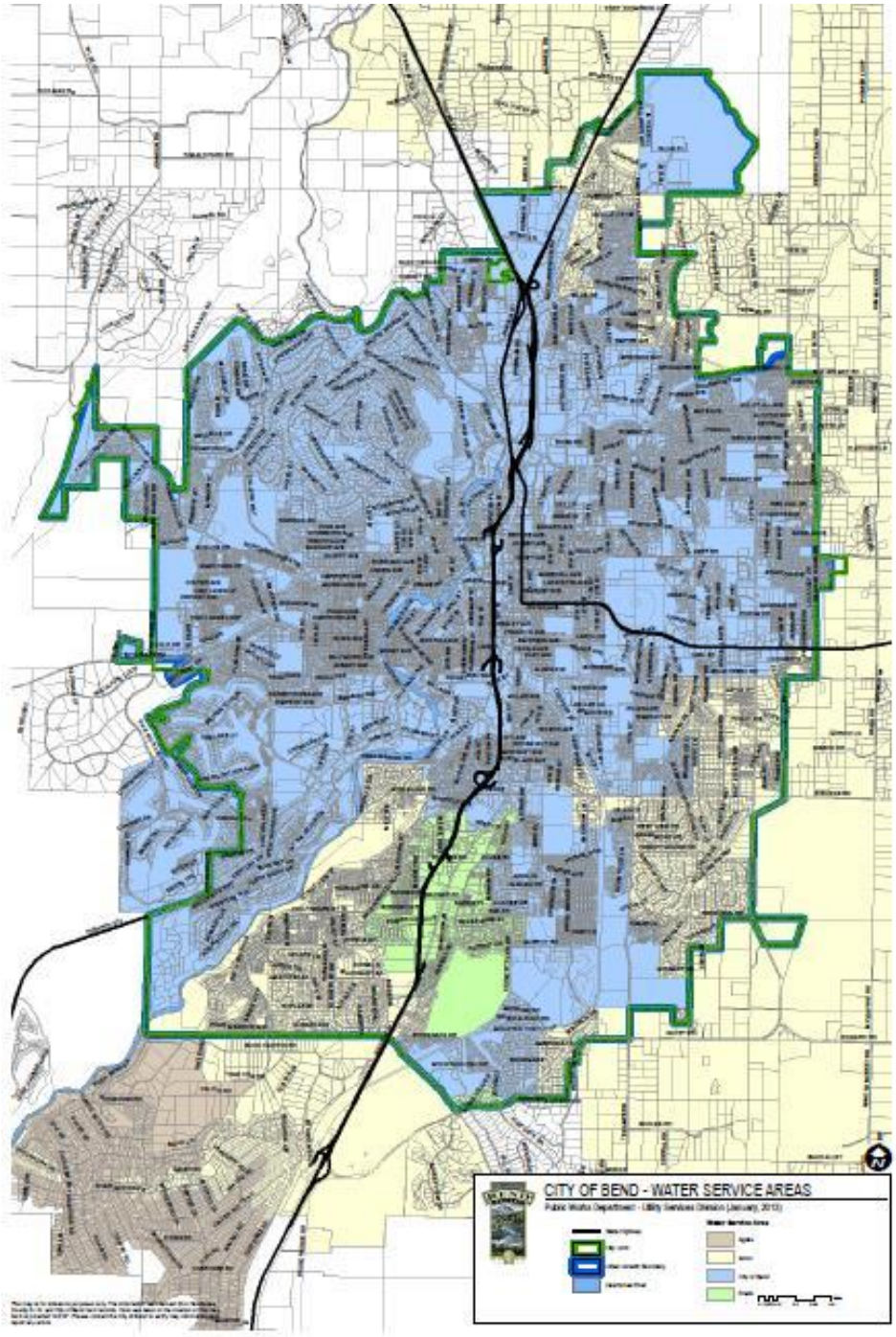


Figure 8-54
Water Utilities in the Bend Urban Growth Boundary




CITY OF BEND - WATER SERVICE AREAS

Private Providers
Currently, the City of Bend serves water to approximately 70% of the customers within the UGB. There are two private utilities supplying domestic water to the majority of the remaining customers. Approximately 9,200 service connections within the UGB are furnished domestic water through private water systems. Figure 8-~~4~~ 5 shows the extent of both the city's service area (blue) and the private providers; Avion (light yellow or tan) and Roats (green). The City has entered into franchise agreements with Avian Water (See Ordinance NS-1514, as amended) and Roats Water Company (See Ordinance NS-1747) through which the City has agreed to Avion Water Company and Roats Water Company providing water to its customers in the city's boundary. Both franchise agreements have been incorporated into the City Code under Chapter 11, Franchises. In addition, the City's water system has inter-ties with both Avion and Roats, which also have inter-ties between their respective systems.

Water System Financing
~~Table 8-2~~ The 2013 Water Public Facilities Plan lists the various water improvement projects the city plans to construct through the year 2028 to support the projected growth and land uses in the Bend urban area. The description, location, timing and estimated cost of listed facilities may change as a result of subsequent design studies, capital improvement programs, environmental studies, and changes in funding sources. City facilities may be constructed earlier than planned by an owner/developer choosing to develop an area prior to the scheduled extension or expansion of facilities by the city.

The city has adopted System Development Charges (SDCs), as allowed under state law, to help pay for new facilities. SDCs are one-time fees imposd on new and increased development to recover the cost of system facilities needed to serve that growth. Like those collected for the sewer system, water SDCs can have two major components; a reimbursement fee that reflects the cost of existing infrastructure with capacity that is available to serve growth, and; an improvement fee that reflects the portion of the cost of future projects that is attributable to providing capacity for growth.~~SDCs are levied against all new uses at the time of development~~. These fees are earmarked for major system improvements identified in the city's 2007 Water System Master Plan Update such as reservoirs, wells, transmission lines, and treatment facilities. As of fiscal year 2006-07, the water System Development Charge is 100 percent of the allowable maximum charge. The City Council determined that this rate reflects the proportionate share of system improvement costs that can be attributed to new growth. The remaining share of system improvement costs benefit the whole community and are collected as a part of the monthly user fees. For more information about short and long term projects for the City's water system please see the 2013 Water Public Facilities Plan.

Storm Drainage Facilities and Systems

For many years, the City of Bend's drainage system has depended primarily on underground injection (dry wells and drill holes) to discharge stormwater into the fractured volcanic rock that underlies much of the City. Dry wells do not work well in areas underlain by layers of impermeable material unless those layers are penetrated. Drill holes are an alternative to dry wells, intended to penetrate impermeable layers to reach more permeable material beneath them.

Bend does not have a city-wide system of pipes collecting and transporting stormwater for treatment. The lack of defined drainage ways, the expense of digging in rock, and the difficult topography have limited the installation of piping. The existing piped system to the Deschutes River is limited to about 14 miles of pipe and 28 river outfalls. There are approximately 4,600 dry wells and 1,000 drill holes on public property in the City and an unknown number on private property. Including interconnections between inlets and UICs, there are 47 miles of pipe total throughout the City.

Water Quality and Stormwater Management

A large part of Bend's drinking water comes from a deep, very high-quality and abundant aquifer beneath the City that is fed by snow melt high in the Cascade Mountains. The City and its residents are committed to protecting this valuable resource along with protecting surface water quality. Protection of all groundwater including perched water and seasonal high groundwater is required by the State of Oregon. To comply with the regulations for both stormwater and groundwater, the City prepared an Integrated Stormwater Management Plan (ISWMP). The ISWMP is a living document that is updated as necessary to meet requirements of the permits and the needs of the City.

The ISWMP outlines a comprehensive program to protect the quality of the Deschutes River and the City's groundwater. The ISWMP identifies a number of BMPs for preventing pollutants from entering stormwater or removing them before the water is discharged to the river or underground. The following BMPs are required elements of the Phase II (surface water) program:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Stormwater Management Activities
- Post-Construction Stormwater Management in New Development and Redeveloped Areas
- Pollution Prevention/Good Housekeeping for Municipal Operations

Bend's ISWMP also addresses monitoring and protecting drinking water sources provisions to meet UIC requirements.

In August 2014 the City adopted its first Stormwater Master Plan (SMP). The City relied on these documents and prior planning documents to develop a Goal 11 stormwater public facility plan (PFP) for the existing Bend UGB. This 2014 Stormwater PFP is incorporated as the Goal 11 public facility plan for stormwater and provides a stormwater management strategy and identifies the capital improvements needed to serve the existing and future development within Bend's UGB.

Stormwater Funding Strategy

In 2007 the City Council established a Stormwater Utility Fee for the sole purpose of funding Stormwater infrastructure projects and programs. The SMP provides a cost strategy. The proposed stormwater public improvements have a 20-year capital cost of $25.2 Million. Utility operating revenue needs were modeled to range from $2.5 Million/year at present to $5.4-$5.6 Million/year by FY2032-33 depending on the rate

assessment approach taken. Monthly stormwater utility rate increases were estimated in two ways: a gradual rate increase and an accelerated rate increase. The immediate calculated monthly stormwater utility rates were modeled to be between $4.36 and $5.80 per ERU and the FY 2032-33 monthly stormwater utility rates would be anticipated between $6.53 and $6.80 per ERU depending on the rate adjustment approach taken. Below is the City's 2013-2014 Stormwater Budget.

Table 8-3.2
Stormwater Management Budget for Fiscal Year 2013-2014

Stormwater Management Budget (Fiscal Year 2013-2014):	
Operation and Maintenance	$1,240,000
Engineering and Project Management	$580,700
Capital Improvement Projects	$2,750,000(1)
Water Quality Management	$378,000
Utility Administration & Public Response	$576,000
Total	**$5,524,700**

Note:
(1) Current Capital Improvement Budget is $2,750,000, based on carryover from previous years and an annual budget currently averaging $300,000

Solid Waste Disposal

Solid waste disposal for the urban area occurs at one county facility, the Knott Pit Sanitary Landfill, just outside of the Urban Growth Boundary on the east side of 27th Street. Deschutes County studies estimate that Knott Landfill will reach capacity by the year 2025. However, the recent trend of 10 to 18 percent annual increases in municipal solid waste flows may shorten that life span.

A second landfill just for construction debris and demolition material located adjacent to Simpson Avenue ~~wihin~~within the Urban Growth Boundary was in operation prior to 1997. This demolition landfill site is about 80 acres, and abuts residential lands on the north, and west, and commercial development along its east and south sides.

Collection of solid waste is done by private providers under city and county franchise. In 2005 it was estimated that only about 92 percent of the households in the Bend Urban Growth Boundary had signed up for a weekly collection service. The two garbage haulers in the Bend urban area, Bend Garbage and Cascade Disposal, provide weekly curb-side pickup of municipal solid waste and recyclable materials. Recyclables picked up at curb-side include aluminum, corrugated cardboard, paper bags, magazines and catalogs, and used motor oil.

The Department of Environmental Quality's 2005 Waste Diversion Report indicated that 160,707 tons of waste were deposited in Knott Landfill and 62,523 tons of waste were "diverted" (recycled by households and businesses either through curb-side service, or dropped off at the county's yard debris mulch program, as well as recycling occurring out of the solid waste system such as bottle bill returns and the scrap metal industry). When backyard composting and efforts in waste prevention and reuse are considered,

the percentage of solid waste material being recycled increases from approximately 28 percent to approximately 34 percent.

Other Urban Utilities

Electricity within the urban area is provided by Pacific Power and Central Electric Cooperative. Cascade Natural Gas Company provides natural gas service to most parts of the urban area. Adequate electric natural gas resources exist to serve the Bend urban area through the planning period.

Local (land-line) telecommunication services are provided by Qwest. Many private companies compete to provide long distance and cellular phone service. Cable television service within the urban area is provided by Bendbroadband, which also provides phone and high-speed internet service. Private utility providers within the city limits operate under non-exclusive franchise agreements with the city.

Public Buildings and Facilities

Downtown Facilities

The Bend City Hall at the south end of downtown was built in 1989 and expanded in 1992. City Hall comprises an area of approximately 26,000 square feet. Also located at the south end of downtown are the Bend-La Pine School District Administrative offices, the Deschutes County historical museum, the Bend Public library, and other public buildings.

The County courthouse and various County offices are located in several buildings at the north end of the downtown area. A new 80,000 square foot administration building was constructed in 2004. Half of this facility is leased to the State Department of Human Services and Department of Justice.
The Bend ~~Metro~~ Park~~s~~ and Recreation District offices are located between the Old Mill District and the Deschutes River.

Fire Department Facilities

The Bend Fire Department serves the city, the urban area, and some areas beyond the Urban Growth Boundary through the Rural Fire District service contract. The Bend Fire Department covers approximately 164 square miles for fire protection and 1,450 square miles for ambulance operations. The “Main Station” (Old Station 301) was built in 1920 and was located downtown at 5 NW Minnesota Avenue. After serving the Bend Fire Department as the main station and the administrative office for 80 years, the department moved out of the station in 2000 to its new location at 1212 SW Simpson Avenue in order to provide better, faster coverage for the community. Old Station 301 was remodeled and became a mixed-use facility including dining, retail, office and residential spaces. The Fire Administration Building at 1212 SW Simpson Avenue was constructed in 2000. It houses the department administrative, prevention and support staff. The “West Station” (Station 301) is also located at 1212 SW Simpson Avenue, on the west side of Bend near Century
Drive. The station is 12,000 square feet in size and was built for a cost of $1.6 million in

2000. The “Tumalo Station” (Station 302) is located at 19850 4th Street in the unincorporated community of Tumalo, between Bend and Sisters. The station was built in the early 1970s. The “South Station” (Station 303) at 61080 County Club Drive was also built in 2000. The “East Station” (Station 304) at 62420 Hamby Road was built in 2003 and is the newest station. The “North Station” (Station 305) at 63377 Jamison Street was built in 2000 and is located on a seven-acre parcel next to the Deschutes County Sheriff’s Office. Located behind Station 305, the department Training Center includes a five-story tower with attached garage, numerous training props, and a driver training area. The Training Center also features a classroom and training office building located near the tower. The Fire Department is planning on building a “Central Station” on the Pilot Butte City Campus within the next ten years in order to better serve the rapidly growing central- east section of Bend.

Law Enforcement Facilities

Law Enforcement services in the urban area are provided by the City of Bend Police Department and the Deschutes County Sheriff’s Department. The Oregon State Police regional headquarters is also located in Bend. The City of Bend Police Department was located in City Hall until 2002, when a new 27,000 square foot building was constructed at the intersection of 15th Street and US Highway 20 to better accommodate and headquarter all police business. As with all other departments at the City, faster than anticipated growth has created a need for additional staff to serve the community and this has, in turn, created the need for additional space. As a result, the Police Building was expanded to include another 19,000 square feet, and ~~now~~ also houses the Bend Municipal Court.

In 1997, Deschutes County constructed a new public safety complex off of Highway 20. Within this complex there is a 228-bed adult jail, the Sheriff's Office, the Adult Parole and Probation offices and transitional housing. The County also constructed the Health and Human Services building off 27th Street on the east side of Bend. This building provides space for the County's Mental Health and Health Departments.

Public Works Facilities

The City’s Public Works Facilities are located in three primary areas: The Pilot Butte Campus Site, which is located west of 15th Street between Highway 20 and Bear Creek Road, the Boyd Acres offices, and the Water Reclamation site, which is located northwest of the Bend Airport on McGrath Road. Numerous additional satellite facilities that house vehicles, utility equipment or materials are located throughout the service area.

The Pilot Butte City Campus site houses Public Works administration and all departmental divisions except Water Reclamation. City Council authorized a substantial master planning effort for this site in 2006 in order to determine space needs for the next twenty years for the Public Works, Police, Community Development and Fire Departments, all of whom will have facilities on the site.

The existing main Public Works building houses Public Works administration and provides crew spaces for the Street and Water Divisions. This 41,000 square foot building will likely undergo significant, phased-in changes in the next seven years in order to bring the building into Code and ADA compliance as well as provide for the anticipated 20 year needs of the department.

A ~~new~~ facility to house Public Transportation operations was ~~recently~~ constructed, at the southwest corner of the Pilot Butte Campus site. The construction was largely funded through a $4 million *ConnectOregon* grant, and includes a 5,500 square foot transit operations office, five vehicle maintenance bays and space for transit vehicle parking. The City's public transit program is operated by Cascade East Transit through Central Oregon Intergovernmental Council. The transfer of this program to COIC began in 2010 and was completed in 2011.

The Water Reclamation facility is located outside of the UGB on 1,600 acres northeast of Bend and includes eight main structures. A new Headworks building was constructed in 2008. This facility will be heated by hot water that is heated by methane gas captured from the waste products entering the facility. New facilities completed within the last five years include a new training building, a Level IV filtration facility and a new digester. The new facilities plan for the plant was completed in 2008, and acknowledged by the Land Conservation and Development in 2010. This plan provides for an expansion and upgrade plan for water reclamation to serve the City up to the year 2030.

The Bend Airport

The Bend Municipal Airport is located on 415 acres situated five miles east of the city limits of Bend. Owned by the City of Bend, the airport is located in Deschutes County and is currently outside the Bend Urban Growth Boundary. Airport facilities consist of a single instrument capable runway, 5005 feet in length, a full parallel taxiway, more than 60 hangar and industrial buildings, and parking facilities for aircraft and vehicles. The Bend Municipal Airport is identified by the Oregon Department of Aviation as a Category 2, High Activity Business/General Aviation airport, with approximately 200 based aircraft and an estimated 42,000 operations in 2005.

Over the past few years, demand at the Bend Airport has increased significantly. Continued business expansion by the existing tenants, the addition of Epic Aircraft in 2005, and continued growth and demand has wrought a dramatic increase in activity at the Airport. The corresponding demand for new services and facilities provides challenges to current funding levels.

Current improvements to the Airport infrastructure include the relocation of the single runway at the Airport to meet federal design standards and provide an adequate surface for the existing aircraft fleet mix. This project, beginning in 2007, is scheduled for completion in 2008. Following the runway relocation project, development of an eastside parallel taxiway will be planned for construction in 2009, with completion scheduled for the same year. At this time, it is anticipated that a new Airport Master Plan to clarify the future direction of the Airport and to meet future user needs will be initiated.

Policies

Sewer Collection Facilities

8-1 All new development within the City Limits should be connected to City sewer.

8-2 The city is the primary provider of sewage collection and treatment services for the City's service area under Statewide Planning Goal 11.

8-3 To reduce the reliance on individual sewage disposal systems within the Urban Growth Boundary the city will work with unsewered neighborhoods to find solutions for sewer service.

8-4 The city should collect a sufficient amount of revenue to allow the creation of capital project reserves and to replace aging infrastructure in addition to operational needs of the utility.

8-5 Staff should report to Council on an annual basis regarding the status of the Collection System Master Plan, Capital Improvement Projects and capacity issues within the collection system.

8-6 The City will annually update its financial model as part of the review of sewer rates and report to Council on any changes in the 20-year financial outlook and subsequent rate impacts.

8-7 The master plan shall be updated at least every 5 years with official review and adoption by Council.

8-8 The preference of the City is to serve development through gravity conveyance and use of the Water Reclamation Facility.

8-9 If lift stations are required to serve new development, regional pump stations shall be relied upon to the extent practicable versus individual or smaller lift stations.

8-10 These policies will be implemented through the City of Bend Public Improvement Construction Procedure Standards & Specifications.

8-11 The City should look for reasonable opportunities to decommission energy- and maintenance-intensive lift stations as part of new development or other City infrastructure projects.

8-12 The City will consider the conservation and water reuse measures in the Water Management and Conservation Plan in infrastructure planning to reduce overall impacts to the sewer collection and treatment system.

8-13 The City may establish wastewater collection facilities such as sewer interceptor lines, outside of the Bend UGB, to better serve the land inside the UGB.

8-14 The City may allow lands outside the UGB to connect to sewer collection facilities located outside of the UGB in order to mitigate a public health hazard, and in a manner consistent with state administrative rules that implement a statewide planning goal concerning public facilities and services.

Water Facilities and Systems

8-~~13~~ 15 The City of Bend is the provider of water service for the City's service area under Statewide Planning Goal 11

8-~~14~~ 16 Avion Water Company is the provider of water service for its franchise area under Statewide Planning Goal 11 and pursuant to the franchise agreement between the City and Avion adopted under Ordinance NS 1514, as amended.

8-~~15~~ 17 Roats Water Company is the provider of water service for its franchise area under Statewide Planning Goal 11 and pursuant to the franchise agreement between the City and Roats adopted under Ordinance NS 1747.

8-~~16~~ 18 Within the urban planning area, public and private water systems shall be consistent with City Standards and Specifications for construction and service capabilities.

8-~~17~~ 19 The City shall continue to coordinate with private providers and irrigation districts in matters of water concerns within the Urban Growth Boundary.

8-~~18~~ 20 The City shall continue to implement a water conservation program that emphasizes education, enforcement, metering, and other methods to use water efficiently.

8-~~19~~21 The City may allow water service outside the UGB at rural levels consistent with Goal 11.

Storm Drainage Facilities and Systems

8-~~20~~ 22 The City of Bend is the stormwater utility for the city limits and urban growth boundary. As the utility, the City shall review its Stormwater Master Plan and Integrated Stormwater Management Plan as needed for compliance with changes in state or federal requirements and at least every five years.

8-~~21~~ 23 The City will initiate funding options (e.g., SDCs, grants, low-income loans) for stormwater capital projects in accordance with applicable laws.

8-~~22~~ 24 Due to the lack of a defined drainage pattern for most of the urban area, development shall, to the extent practicable, contain and treat storm drainage on- site. In instances where containing storm

drainage on-site would not be safe or practicable, the developer shall enter into a formal and recorded arrangement with the City or a private party to adequately address the storm drainage off site such as a regional control.

8-~~23~~ 25 The use of stormwater disposal systems shall be coordinated with the Oregon Department of Environmental Quality and Water Resources Department to protect ground water and surface water.

8-~~24~~ 26 The City shall work to minimize the discharge of untreated stormwater run-off from streets directly into the Deschutes River and Tumalo Creek.

8-~~25~~ 27 All public and private stormwater facilities shall be designed and operated in accordance with the City's Stormwater Master Plan and shall meet appropriate drainage quantity and quality requirements, including, but not limited to, the requirements of the City's National Pollutant Discharge Elimination System (NPDES) MS4 Stormwater Permit, Integrated Stormwater Management Plan, WPCF UIC Permit and any applicable Total Maximum Daily Load requirements (TDML) requirements. Underground injection and surface discharges to the Deschutes River or Tumalo Creek shall only be approved when other alternatives, such as retention basins or bioinfiltration swales, are not reasonably available. Low impact site designs shall be a required part of all new development and redevelopment projects.

8-~~26~~ 28 The ability to provide stormwater facilities for developments proposed for annexation into the City shall be a consideration for annexation approval.

8-~~27~~ 29 The City shall reduce the quantity of runoff and discharge of pollutants to the maximum extent practicable by integrating stormwater runoff controls into new development and redevelopment land use decisions. Controls may be required to minimize illicit discharges or pollutants of concern.

8-~~28~~ 30 The City shall implement and enforce requirements for an erosion and sediment control program for public and private construction and post-construction activities.

8-~~29~~ 31 All developments shall evaluate the potential of a land parcel to detain excess stormwater runoff and require incorporation of appropriate controls, for example through the use of detention facilities to address quantity, flow, and quality concerns.

8-~~30~~32. The City shall seek efficiencies and consistency by working with other municipalities and stakeholders within Central Oregon on land use issues to address flood control, watershed health and

stormwater pollution prevention.

8-~~31~~ 33 Hazard and resource areas with the following characteristics shall be considered unsuitable for urban development:

- flood zones;
- water supply watersheds; and
- riparian corridors and natural drainageways.

8-~~32~~ 34 Development on slopes in excess of 10 percent shall require special consideration to prevent construction-related and post-construction erosion.

8-~~33~~ 35 The City shall regulate development near water courses to reduce erosion and pollution and to provide open, natural areas.

8-~~34~~ 36 Land uses that pose a major threat to water quality, including commercial and industrial uses such as automobile dismantlers, waste transfer disposal facilities, light industries, and other uses that have a significant potential for pollution, shall not be located within the vicinity of stream, percolation facilities, reservoirs, drill holes or where pollutants could easily come in contact with flood waters, high groundwater, flowing rivers, or reservoirs. Such uses shall be required to reduce any threat of pollution to an insignificant level as a condition of approval.

8-~~35~~ 37 As part of site approval, or as a condition on tentative maps, as necessary, the City shall require permanent stormwater pollution control site design or treatment measures or systems and an ongoing method of maintenance over the life of the project.

8-~~36~~ 38 The City shall minimize particulate matter pollution through controls over new and redevelopment (including erosion and sediment controls on grading, quarrying, vegetation removal, construction, and demolition), industrial processes, parking lots and other activities that pose a threat to water quality.

8-~~37~~ 39 The City shall require the following stormwater protection measures for all new development and redevelopment proposals during the planning, project review, and permitting processes:

- Submit geotechnical site assessments when dry wells or other infiltration or injection systems are proposed.
- Avoid conversion of areas particularly susceptible to erosion and sediment loss (e.g., steep slopes) or establish development guidance that identifies these areas and protects them from erosion and sediment loss.
- Retain natural drainage channels in their natural state to prevent undue erosion of banks or beds, and preserve or

restore areas that provide water
- quality or quantity benefits and/or are necessary to maintain riparian and aquatic biota.
- Promote site development that limits impacts on, and protects the natural integrity of topography, drainage systems, and water bodies.
- Promote integration of stormwater quality protection into construction and post-construction activities at all development and redevelopment sites.

8-~~38~~ 40 The City shall work to reduce transportation-related sources of water pollution, particularly in stormwater pollution. Any means and actions that result in a reduction in vehicle-miles-traveled would benefit congestion and reduce both air and water pollution.

8-~~39~~ 41 The City shall recognize and publicize the relationship between air pollution and water pollution in the deposition of airborne contaminants, including metals and fine particulate matter onto streets and other surfaces.

8-~~40~~ 42 To minimize illicit discharge to stormwater and groundwater from septic systems, the City shall require lots with onsite sewage disposal to connect to the city sanitary sewer whenever state rules governing connection are met.

Solid Waste Disposal

8-~~41~~43 The city and county shall encourage recycling beyond the level required by state law as an alternative to landfill disposal.

8-~~42~~44 The county shall reduce dust and blowing refuse at the landfills in order to ensure as few adverse impacts as possible from these facilities.

8-~~43~~45 The city shall explore methods, including mandatory garbage service, to gain 100 percent disposal of waste at designated landfill sites and discourage the dumping of wastes on public and private lands.

8-~~44~~46 The City shall coordinate with Deschutes County on the creation of a new solid waste management plan.

Public Buildings and Facilities

8-~~45~~47 Public buildings and facilities shall be located so as to provide convenient public use and to provide maximum service for the greatest economy. Governmental offices should locate downtown when practicable. Other governmental facilities, reservoirs, landfills and correctional facilities should be located in areas with good

public access to principal streets.

8-~~46~~48 The County Public Works facility shall be planned and zoned with a Public Facilities designation. The uses allowed at the site from among those uses listed in a Public Facility zone shall be limited to public works and transportation facilities and yards and public service uses in existing facilities as such facilities may be expanded and accessory uses thereto. Commercial or manufacturing uses shall not be allowed at this site.

General Policies

8-~~47~~49 The City may consider funding mechanisms and agreements to address on-site and off-site improvements, modernization of existing infrastructure to City's standards and specifications, and impacts to infrastructure inside the current City limits.

Exhibit B

Findings in Support of the Bend Planning Commission's Recommendation in their July 23, 2018 Order on 17SPFP

July 2018

FINDINGS REPORT

To Support Amendments to the text of Chapter 2, Natural Resources and Open Space, and Chapter 3, Community Connection, of the Bend Comprehensive Plan

I. Purpose and Context

These findings support the decision to amend the text of Chapter 2, Natural Resources and Open Space, and Chapter 3, Community Connections, of the Bend Comprehensive Plan. The Bend Park and Recreation District (BPRD), a special district that provides park and recreation facilities for an area slightly larger than the Bend City limits, is updating their Comprehensive Plan. This update of the Bend Park and Recreation District's Comprehensive Plan includes an inventory of existing parks, trails, and recreational facilities and establishes a framework for developing future parks, trails, and recreational facilities for the next ten years (up to 2028) based upon the community's needs.

The City, in coordination with Bend Park and Recreation District, is amending Chapters 2 and 3 of the Bend Comprehensive Plan, to update outdated text and to clarify existing policies relevant to parks, recreation, and open space.

These findings address OAR 660-015-0000(8), Goal 8, and other applicable Statewide Planning Goals as well as applicable plan policies of the Bend Comprehensive Plan and Bend Development Code.

II. Proposal

The Proposal supported by these findings include:

1. Amendments to the text of Chapter 2 of the Bend Comprehensive Plan, Natural Resources and Open Space, dated May 2018;
2. Amendments to the text of Chapter 3 of the Bend Comprehensive Plan, Community Connections, dated May 2018.

The Proposal does not propose further amendments to chapters of the Comprehensive Plan, and proposes no changes to the Bend Development Code.

III. Background

1. In 2016, the City adopted a set of significant amendments to the Bend Comprehensive Plan, including a UGB amendment that added 2,380 acres to the Bend UGB. Through Ordinance 2271, the City also adopted several new plan chapters and new appendices to support the adoption of the UGB amendment.

2. Through this ordinance, the City is amending Chapters 2 and 3 to update the format and correct outdated text through minor text changes.
3. In May of 2018, the Bend Park and Recreation District released their Draft Comprehensive Plan which addresses the future growth of Bend and identifies the District's plans, policies, and priority projects to serve the community's needs for parks and open space until 2028.
4. In June of 2018, the City worked with the Bend Park and Recreation District to update outdated text, information, and park inventories in the City's Comprehensive Plan.
5. The Bend Park and Recreation District is conducting a thorough public outreach process to update their Comprehensive Plan and plans to adopt the 2018 Comprehensive Plan on July 17, 2018.
6. The amendments that are subject to these findings are focused on the planning and provision of recreational needs, events, and facilities as well as the natural resources, open spaces, and cultural amenities for the City.

IV. Applicable Criteria

Legislative land use decisions must comply with the applicable provisions of the statewide land use planning goals, statutes and administrative rules, and unamended provisions of the comprehensive plan and implementing regulations. Legislative land use decisions must also be internally consistent pursuant to Statewide Planning Goal 2, Land Use Planning. Although other applicable goals are addressed in these findings, Goals 8, 5, and 11 are most directly applicable for this action. No Oregon state statutes are applicable. These findings address:

1. Statewide Planning Goal 8, Recreation;
2. Statewide Planning Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces;
3. Statewide Planning Goal 11, Public Facilities;
4. Other Applicable Statewide Planning Goals
    i. Goal 1: Citizen Involvement,
    ii. Goal 2: Land Use Planning,
    iii. Goal 3: Agricultural Lands,
    iv. Goal 4: Forest Lands,
    v. Goal 6: Air, Water, and Land Resources Quality
    vi. Goal 7: Areas Subject to Natural Hazards
    vii. Goal 9, Economic Development
    viii. Goal 10, Housing
    ix. Goal 12, Transportation
    x. Goal 13: Energy Conservation
    xi. Goal 14, Urbanization

xii. Goals 15 through 19

5. Bend Comprehensive Plan – applicable policies
    i. Preface
    ii. Chapter 1, Plan Management and Citizen Involvement
        1. Urban Planning Coordination Policy 1-4
    iii. Chapter 3, Community Connections,
        1. Parks and Recreation Facilities Policies 3-5 to 3-8; Urban Trails Policies 3-9 to 3-11
    iv. Chapter 5, Housing,
        1. Transportation Connectivity Policy 5-42 to 5-43
    v. Chapter 7, Transportation
        1. Pedestrian and Bicycle Systems Policy 7-28
    vi. Chapter 8, Public Facilities and Services
    vii. Chapter 11, Growth Management
        1. Policies for Residential Neighborhoods Policy 11-17 and 11-28
6. Bend Development Code (BDC) 4.6.200, Legislative Amendments

V. Substantial Evidence

The following lists represents the key evidence that supports the findings in the following sections.

1. Bend Park and Recreation District 2018 (Draft) Comprehensive Plan

VI. Finding Addressing Statewide Planning Goal 8 (OAR 660-0015-0000(8)), Recreation;

Goal 8: To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.

FINDING: The proposed amendments are minor text changes that continue to recognize BPRD as the urban service provider of parks within the City of Bend. By recognizing the District's Plan as the Comprehensive Plan for parks and recreation for the Bend UGB, the City supports the District's work to satisfy the recreational needs of the community. The proposed amendments therefore satisfy Goal 8 by supporting the Park District to address the recreational needs and siting of necessary recreational facilities.

VII. Findings Addressing Statewide Planning Goal 5, Natural Resources (OAR 660-0015-0000(5)), Scenic and Historic Areas, and Open Spaces;

Goal 5: ***To protect natural resources and conserve scenic and historic areas and open spaces***

FINDING: The proposed amendments are minor text changes that continue to support the natural resource, open space, and historic area conservation goals of the City and the District and therefore satisfy Goal 5.

VIII. Findings Addressing Statewide Planning Goal 11, Public Facilities;

Goal 11: Public Facilities and Services

To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

FINDING*:* Goal 11 considers recreation facilities and services as "urban facilities or services". Under Goal 11, a *"timely, orderly and efficient arrangement"* refers to a system or plan that coordinates the type, locations, and delivery of public facilities and services in a manner that best supports the existing and proposed land uses. The proposed amendments to Chapters 2 and 3 of the Comprehensive Plan are minor text changes that continue to satisfy Goal 11 by supporting BPRD as the urban service provider of parks and recreation facilities and services for the City of Bend. By doing so, the City is supporting the timely, orderly, and efficient arrangement of park and recreation facilities according to the District's Plan.

IX. Findings on OAR 660-0015, Compliance with Statewide Planning Goals

1. Goal 1: Citizen Involvement,

Goal 1: ***To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.***

FINDING: The proposed amendments will meet Goal 1 because the City has used its citizen involvement program to ensure citizens have an opportunity to review and comment on the proposed changes to Chapters 2 and 3 of the Bend Comprehensive Plan. In addition, BPRD conducted "*a two-year public engagement process*" that was the "*most robust public involvement campaign in [BPRD's] District history*" to develop their 2018 Comprehensive Pan[1].

2. Goal 2: Land Use Planning,

Goal 2: ***To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.***

[1] See pp 1-2 of the District's 2018 Comprehensive Plan

FINDING: Goal 2 requires that special districts plans and actions related to land use shall be consistent with the comprehensive plans of cities. In addition, it defines "*Major Revisions*" to Comprehensive Plans compared to "*Minor Changes*". "*Minor Changes*" are "*those which do not have a significant effect beyond the immediate area of the change, should be based on special studies or other information which will serve as the factual basis to support the change*". The proposed amendments to Chapters 2 and 3 demonstrate a continued coordination between the City and BPRD to ensure that local plans are consistent. The proposed changes are supported by BPRD's Draft 2018 Comprehensive Plan which will be adopted by the time these amendments are adopted. By updating outdated text and inventories of the Bend Comprehensive Plan, the City can support BPRD's most recent update of their Comprehensive Plan and therefore ensures that the City's Comprehensive Plan continues to serve as a factual base.

3. **Goal 3: Agricultural Lands,**

Goal 3: ***To preserve and maintain agricultural lands.***

FINDING: This goal is not applicable because the proposed amendments do not affect agricultural lands.

4. **Goal 4: Forest Lands,**

Goal 4: ***To conserve forest lands by maintaining the forest land base and to protect the state's forest economy by making possible economically efficient forest practices that assure the continuous growing and harvesting of forest tree species as the leading use on forest land consistent with sound management of soil, air, water, and fish and wildlife resources and to provide for recreational opportunities and agriculture.***

FINDING: This goal is not applicable because the proposed amendments are intended to serve those land uses within the Bend UGB that are planned for under the Bend Comprehensive Plan.

5. **Goal 6: Air, Water, and Land Resources Quality**

Goal 6: ***To maintain and improve the quality of the air, water and land resources of the state.***

FINDING: The proposed amendments to Chapter 2 and 3 of the Comprehensive Plan meet this goal because they do not affect existing goals and policies related to air, water, and land resource quality.

6. **Goal 7: Areas Subject to Natural Hazards**

Goal 7: ***To protect people and property from natural hazards.***

FINDING: This goal is not applicable because the Comprehensive Plan does not include an inventory of Goal 7 natural hazards that would potentially be affected by the proposed text amendments.

7. Goal 9, Economic Development

Goal 9: ***To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.***

FINDING: The proposed amendments to Chapters 2 and 3 of the Comprehensive Plan are minor changes that do not impact the City's goals or policies that satisfy Goal 9.

8. Goal 10, Housing

Goal 10: To provide for the housing needs of citizens of the state.

FINDING: The proposed amendments to Chapters 2 and 3 of the Comprehensive Plan are minor changes that do not impact the City's goals or policies that satisfy Goal 10.

9. Goal 12, Transportation

Goal 12: To provide and encourage a safe, convenient and economic transportation system.

FINDING: This goal is not applicable because the proposed amendments do not propose any changes to the city's transportation system that would trigger review under Goal 12 or its administrative rule under OAR 660-012. The 2018 BPRD proposed trail plans will be reviewed in conjunction with the City's current Transportation System Plan update at a later date.

10. Goal 13: Energy Conservation

Goal 13: To conserve energy.

FINDING: This goal is not applicable because the proposed amendments do not propose any changes to the land uses allowed under the Bend Comprehensive Plan that would require more energy be used.

11. Goal 14, Urbanization

Goal 14: To provide for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.

FINDING: This goal is satisfied by recognizing BPRD as the urban service provider of park and recreation facilities within the UGB. The BPRD's work to provide parks and recreation services for Bend ensures it will remain a livable community.

12. Goals 15 through 19

FINDING: These goals are not applicable because the City is not located within the Willamette River Greenway, and is not located within or adjacent to any coastal or estuarine resources.

X. Finding on Compliance with the Bend Comprehensive Plan – applicable policies

1. Preface,

Future Plan Updates

The Comprehensive Plan is a document that changes over time to reflect new information and new directions for the future. Amendments or additions to the Comprehensive Plan text, exhibits, and policies go through a public hearing and review process before being adopted by the governing bodies. Changes and updates can be generated in at least six ways:

- ***Changes proposed by individuals or other agencies. A proposal by an individual, corporation, or public agency to change to the Plan text, land use map, other exhibits, or policies shall be considered as determined by the procedures ordinance. A person or agency proposing a change has the burden to demonstrate a public need and benefit for the change.***

FINDING: The City proposes amendments to the text of Chapters 2 and 3 of the Comprehensive Plan which have been initiated by proposed changes from the Bend Park and Recreation District. The following plan policies were identified as being applicable to the review of these proposed amendments. These findings demonstrate that the proposed amendments are consistent with the applicable plan policies.

2. Chapter 1, Plan Management and Citizen Involvement

i. Urban Planning Coordination Policy 1-4

1-4: The City and special districts shall work toward the most efficient and economical method for providing their services within the UGB.

3. Chapter 3, Community Connections,

i. Parks and Recreation Facilities Policies 3-5 to 3-8; Urban Trails Policies 3-9 to 3-11

3-5: The City will apply a new "Public Facilities" zone for public parks and recreation facilities within the planning area.

FINDING: The proposed changes maintain this policy.

3-6: The City shall support efforts by the Park and Recreation District and Bend-La Pine School District to jointly develop school-park sites to meet neighborhood park and school recreation needs.

FINDING: The proposed changes maintain this policy.

3-7: Sites for small neighborhood parks are not shown on the Land Use Plan Map, but the city shall encourage private or public parties to develop small neighborhood parks.

FINDING: The proposed changes maintain this policy.

3-8: The City shall refer to the park district, for its review and recommendations, all development proposals that include or are adjacent to existing or proposed parks or trails.

FINDING: The proposed changes maintain this policy.

3-9: The City will continue to work with the county, irrigation districts, state and park district to develop a series of trails along the Deschutes River, Tumalo Creek, and the major canals so that these features can be retained as an asset in the urban growth boundary and urban reserve area.

FINDING: The proposed changes maintain this policy. The 2018 Bend Park and Recreation District's proposed trail plans will be reviewed in conjunction with the City's current Transportation System Plan update at a later date.

3-10: The trails designated on the Bicycle and Trail System map shall be the basis for developing a trail system that serves the recreational and transportation needs of the community.

FINDING: The proposed changes maintain this policy. The 2018 Bend Park and Recreation District's proposed trail plans will be reviewed in conjunction with the City's current Transportation System Plan update at a later date.

3-11: The City, when practical, shall require connecting links to the urban trail system from all adjacent new developments.

FINDING: The proposed changes maintain this policy. The 2018 Bend Park and Recreation District's proposed trail plans will be reviewed in conjunction with the City's current Transportation System Plan update at a later date.

4. **Chapter 5, Housing,**
    i. Transportation Connectivity Policy 5-42 to 5-43

5-42 Schools and parks may be distributed throughout the residential sections of the community, and all types of dwelling units should have safe and convenient access to schools and parks.

FINDING: The proposed changes maintain this policy.

5-43 The City will coordinate with the school and parks districts to ensure that the respective plans of each local government are coordinated and consistent with state law.

FINDING: The proposed amendments ensure that this policy is upheld and maintain the policy itself.

5. **Chapter 7, Transportation**
    i. Pedestrian and Bicycle Systems Policy 7-28

7-28: The City shall work together with the Park District to acquire, develop and maintain the primary trails designated on the Bend Urban Area - Bicycle and Pedestrian System Plan; Figure 7-2. New development shall be required to construct and dedicate Primary Trails for public use according to this plan. The alignments depicted are general in nature and shall be located according to criteria defined in TSP Section 6.3.1.3. These trails, and future trail additions, shall support the need for non-motorized travel in the community.

FINDING: The proposed changes maintain this policy. The 2018 Bend Park and Recreation District's proposed trail plans will be reviewed in conjunction with the City's current Transportation System Plan update at a later date.

6. Chapter 11, Growth Management
    i. Policies for Residential Neighborhoods Policy 11-17, 11-28

11-17 Schools and parks may be distributed throughout the residential sections of the community, and all types of dwelling units should have safe and convenient access to schools and parks. The School District and Park District facilities plans will determine the location and size of needed schools and parks.

FINDING: The proposed amendments ensure that this policy is upheld and maintain the policy itself.

11-28 Some UGB expansion areas have identified preliminary needs for schools and parks. The need and location for schools and parks is determined by the facility planning of the School District and Park District. The School Attendance Areas and Park Service Areas may change and the Area Plans for the UGB expansion areas should take into account any updated school and park needs when the plan is prepared.

FINDING: The proposed amendments ensure that this policy is upheld and maintain the policy itself.

XI. Findings on Compliance with Bend Development Code (BDC) 4.6.200, Legislative Amendments

4.6.200 – Legislative Amendments

A. Applicability, Procedure and Authority. Legislative amendments generally involve broad public policy decisions that apply to other than an individual property owner. These include, without limitation, amendments to the text of the Comprehensive Plan and map, Development Code and changes in the zoning map not directed at a small number of properties. They are reviewed using the Type IV procedure in accordance with Chapter 4.1, Land Use Review and Procedures and shall conform to BDC 4.6.600, Transportation Planning Rule Compliance. A legislative amendment may be approved or denied.

FINDING: This criterion is applicable because the City proposes a legislative amendment to the text of the Bend Comprehensive Plan and has followed the applicable procedures. This proposed amendment include minor changes to Chapters 2, Natural Features and Open Space, and Chapters 3, Community Connections, of the Bend Comprehensive Plan.

B. Criteria for Legislative Amendments. The applicant shall submit a written narrative which explains how the approval criteria will be met. A recommendation or a decision to approve or to deny an application for a legislative amendment shall be based on all of the following criteria:

1. The request is consistent with the applicable State land use law;

FINDING: The findings under Sections VI, VII, and VIII, and IX above show the proposed amendments are consistent with Statewide Planning Goals.

2. The request is consistent with the applicable Bend Comprehensive Plan goals and policies;

FINDING: The proposed amendments to Chapters 2 and 3 meet this criterion because the findings in Section VI and VII show the proposed amendments are consistent with the Bend Comprehensive Plan.

3. The applicant can demonstrate a public need or benefit for the proposed amendment.

FINDING: The proposed amendments meets this criterion because the City has demonstrated that the amendments fulfill a public need and provides a public benefit. The public need satisfied by the adoption of the amendments is the need to have coordinated park and recreational facility development between the City and special districts. These uses include those that will be developed in the Opportunity Areas, and in the UGB Expansion Areas. The public benefit for the change includes the recognition of BPRD as the urban service provider for parks and recreation facilities and services that will support the development of land uses allowed under the Comprehensive Plan.

CONFORMANCE WITH THE BEND DEVELOPMENT CODE SECTION 4.6.200:

FINDING: The proposed amendments to Chapter 2 and 3 of the Comprehensive Plan are consistent with Bend Development Code Section 4.6.200.

CONCLUSIONARY FINDINGS: Based on the findings above, the proposed minor changes to amend Chapter 2, Natural Features and Open Space, and Chapter 3, Community Connections, of the Bend Comprehensive Plan are consistent with and implement all applicable statewide planning goals, all applicable policies of Bend's Comprehensive Plan and are consistent with Bend Development Code Section 4.6.200.

July 2018

FINDINGS REPORT

To Support Adoption of a 2018 Goal 11 Collection System Public Facility Plan and amendments to Chapter 8, Public Facilities, of the Bend Comprehensive Plan

I. Purpose and Context

These findings support the decision to adopt a 2018 Collection System Public Facility Plan (CSPFP) for the City of Bend. The 2018 CSPFP covers the areas within the Bend urban growth boundary (UGB) for which the City provides or will provide sanitary sewer collection. In 2016, the City Council adopted amendments to the Bend UGB, which added ten expansion areas to the UGB, that will either be master or area planned and subsequently annexed into the City. The 2018 CSPFP incorporates projects needed to serve these areas, and changes to the sizes and the locations of two key interceptor lines that were identified in the planning for the UGB expansion.

Concurrently with the adoption of the 2018 CSPFP, the City also proposes to amend Chapter 8 of the Bend Comprehensive Plan, Public Facilities and Services, to reflect those changes identified in the 2018 CSPFP, including projects needed to serve the entire UGB and specific expansion areas, and adopt policies needed to support its implementation. The policies proposed are intended to support the development of two new sewer interceptors outside of the Bend UGB, and in a manner consistent with state law. The amendments to Chapter 8 also include those conforming amendments to include figures and tables from the CSPFP, and make corrections to certain text.

Finally, these findings address OAR 660-015-0000(11), Goal 11, the Goal 11 administrative rule at OAR 660-011, the applicable statewide planning goals, the applicable plan policies of the Bend Comprehensive Plan, and the requirements for a legislative amendment under Bend Development Code 4.6.200.

II. Proposal

The Proposal supported by these findings includes:

1. A 2018 Collection System PFP, dated June 2018;
2. Amendments to the December 6, 2016 version of Chapter 8 of the Bend Comprehensive Plan dated May 2018.

The Proposal does not propose further amendments to the Comprehensive Plan, and proposes no changes to the Bend Development Code.

III. Background

1. The City adopted a Goal 11 public facility plan for the sewer collection system (2014 CSPFP) for the Bend UGB in 2014 through Ordinance No. 2231. The 2014 CSPFP was based on the Bend Comprehensive Plan and the UGB in place at that time.

2. In 2016, the City adopted a set of significant amendments to the Bend Comprehensive Plan, including a UGB amendment that added 2,380 acres to the Bend UGB. Through Ordinance 2271, the City also adopted several new plan chapters and new appendices to support the adoption of the UGB amendment.

3. In 2017, the City began work to update the Collection System PFP to identify and subsequently incorporate several new projects and changes to existing projects in the PFP to ensure the City could provide sewer collection services to the areas added to the UGB in 2016.

4. The public facility plan (CSPFP) that is the subject of these findings is focused on the City's wastewater or sewer collection system. In 2010, the Oregon Land Conservation and Development Commission approved the public facility plan for the City's water reclamation facility (See Order 001795).

IV. Applicable Criteria

Legislative land use decisions must comply with applicable provisions of the statewide planning goals, applicable statutes and administrative rules, and applicable unamended provisions of the comprehensive plan and implementing regulations. Legislative land use decisions must also be internally consistent pursuant to Statewide Planning Goal 2, Land Use Planning. The following goals, rules, plan policies, and development code text are the criteria applicable to review of the Proposal:

1. Statewide Planning Goal 11, Public Facilities and Services;

2. Oregon Administrative Rules (OAR) Chapter 66, Division 11, Implementation of Goal 11

3. Applicable Statewide Planning Goals:
    a. Goal 1, Citizen Involvement
    b. Goal 2, Land Use Planning
    c. Goal 3, Agriculture
    d. Goal 5, Natural Resources, Scenic and Historic Areas, and Open Spaces
    e. Goal 6, Air, Land, and Water Quality
    f. Goal 8, Recreation
    g. Goal 9, Economic Development

h. Goal 10, Housing
i. Goal 14, Urbanization

4. Bend Comprehensive Plan – applicable policies:
    a. Preface: Changes proposed by individuals or other agencies
    b. Chapter 1, Plan Management and Citizen Involvement:
        i. Urban Planning Coordination Policy 1-5
        ii. Urban Planning Coordination Policy 1-6
    c. Chapter 5, Housing:
        i. Neighborhood Appearance Policy 5-32
        ii. Public utilities and services Policy 5-52
    d. Chapter 6, Economy:
        i. General Policies 6-3 and 6-4
    e. Chapter 8, Public Facilities and Services
        i. Sewer Collection Facilities Policies 8-1 through 8-12, and proposed policies 8-13 and 8-14
    f. Chapter 11, Growth Management
        i. General Area Planning Policy 11-21
        ii. Master Planning Policy 11-31
        iii. Annexation Policy 11-43

5. Bend Development Code Section 4.6.200, Legislative Amendments

V. Substantial Evidence.

The following documents represent the substantial evidence upon which the City relied to prepare these findings.

1. Final Collection System Public Facility Plan, June 2018
2. Draft Technical Memorandum “Sanitary Sewer Projects for Key Development Areas,” March 12, 2018
3. Technical Memorandum “Future Land Use Assumptions Documentation: Bend Sewer Public Facility Plan (PFP),” September 19, 2017
4. Technical Memorandum “UGB Expansion – Sanitary Sewer Analysis – Long term Optimization,” October 14, 2016
5. Technical Memorandum “UGB Expansion – Sanitary Sewer Analysis, Scenario 2.1G,” July 20, 2016

VI. Findings Addressing Statewide Planning Goal 11 (OAR 660-0015-0000(11)), Public Facilities and Services

Goal 11 - To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

FINDING: The proposed 2018 CSPFP satisfies Goal 11 because it proposes a timely, orderly, and efficient arrangement of sewer collection facilities that will serve as a framework for urban development in Bend's UGB. Under Goal 11, a *"timely, orderly and efficient arrangement"* refers to a system or plan that coordinates the type, locations, and delivery of public facilities and services in a manner that best supports the existing and proposed land uses. The proposed CSPFP is consistent with and builds on the work completed in the 2014 Collection System Master Plan (CSMP), and the 2014 Collection System PFP (CSPFP). The proposed 2018 CSPFP includes capital projects that either rely or support gravity conveyance of effluent to the City's Water Reclamation Facility (WRF). The 2018 CSPFP furthers Goal 11 by providing a comprehensive planning document that summarizes system information and serves as guidance for sound stewardship of its sewer collection system.

GUIDELINES

A. PLANNING

1. Plans providing for public facilities and services should be coordinated with plans for designation of urban boundaries, urbanizable land, rural uses and for the transition of rural land to urban uses.

FINDING: The proposed CSPFP is consistent with this guideline because it serves as the collection system public facility plan for the Bend UGB. The CSPFP was coordinated with the planning for development of urban and urbanizable land inside the Bend city limits and the newly acknowledged UGB. The 2018 Collection System PFP relies on and updates the 2014 CSMP and an analysis prepared by MSA and summarized in technical memoranda (See Section V of this report). The 2018 CSPFP focuses on what improvements are needed to ensure urban and urbanizable land can develop over the planning period. The 2014 PFP initially covered a planning period of 2008 to 2028, but has been updated to cover a planning period of 2013 to 2033. The CSMP included assumptions used for the city's planning for the UGB in 2014. Appendix 3A, *Land Use Assumptions in CSMP GIS Data* located in Volume 4 of the CSMP; page 3A-1, provides a technical memorandum that explains the assumptions and process used to load the hydraulic model in the CSMP based on land use data. It also provides data to be used in subsequent analysis relying on population projections and growth rates.

For the 2018 CSPFP, the City relied on analysis of the UGB, including those areas added through the UGB expansion (See Scenario 2.1G) to estimate future flows and ensure that future projects were identified to provide wastewater collection for the land uses contemplated under the Comprehensive Plan[1]. This analysis updated the data relied upon for the 2014 CSPFP by relying on updated flow and loading data developed for Scenario 2.1G. The 2018 CSPFP includes those new improvements that were

[1] See September 17, 2017 technical memo and October 2016 technical memo, pages 12 through 26. See also pages 43 through 48 of the 2018 CSPFP.

developed through an optimization process conducted after the adoption of the 2016 UGB Expansion[2].

2. Public facilities and services for rural areas should be provided at levels appropriate for rural use only and should not support urban uses.

FINDING: This criterion is not applicable, because the 2018 CSPFP is intended to serve the urban and urbanizable areas of the current Bend UGB. The City has not proposed and is not providing new sewer public facility services, as defined under the Goal 11 rule, to serve areas outside of the Bend UGB. The City will continue to plan for and provide existing sewer service to a limited number of developments outside of the Bend UGB that have prior approval. These are limited to Tetherow, a Goal 8 destination resort, and the Inn at the Seventh Mountain/Widgi Creek Resort Community[3]. This report includes findings in a subsequent section that describe two sewer interceptors that will be located outside of the UGB, but intended to serve only those areas inside the UGB.

3. Public facilities and services in urban areas should be provided at levels necessary and suitable for urban uses.

FINDING: The 2018 CSPFP has been prepared to provide levels of service necessary and suitable for urban uses. The CSPFP includes all areas within the recently expanded urban growth boundary (2016) that are currently served or will be served by the system within the planning period. The extent of development anticipated within the urban growth boundary is defined in the adopted 2016 Comprehensive Plan. Section V of this report lists the technical memoranda that explains the assumptions and process used to load the hydraulic model in based on land use data. The City's engineering consultant relied on this data to update it with the estimated levels of housing and jobs in the Opportunity Areas and the Expansion Areas of the UGB[4].

4. Public facilities and services in urbanizable areas should be provided at levels necessary and suitable for existing uses. The provision for future public facilities and services in these areas should be based upon: (1) the time required to provide the service; (2) reliability of service; (3) financial cost; and (4) levels of service needed and desired.

FINDING: The 2018 CSPFP shows that sewer facilities and services will be provided at levels necessary and suitable for existing uses within the recently expanded urban growth boundary. The 2018 CSPFP relies on the updated information provided in the

[2] Ibid, page 19 and Section 6 of the 2014 CSMP, "Optimization."
[3] Tetherow is a Goal 8 destination resort approved by Deschutes County in 2005 under CU-04-94. The Inn of the 7th Mountain/Widgi Creek is designated a resort community under Section 4.8 of the County's Comprehensive Plan and zoned Resort Community under Chapter 18.110 of the County's Zoning Ordinance.
[4] See July and October 2016 technical memoranda, and March 12, 2018 technical memorandum under Section V of this report.

2014 CSMP including the condition of the city's facilities, the cost of the system and the timing of needed services.

The sequencing of projects is outlined and discussed in the 2018 CSPFP. The project timing is based on existing and future system deficiencies and known operational issues. The CSMP underwent an optimization process in 2013-2014 to determine the combination of improvements that satisfy hydraulic performance criteria and minimize overall lifetime costs. The optimization process results in more reliable system for the long term. System costs are also factored into the optimization process.

The 2018 CSPFP describes the City's Capital Improvement Program for proposed improvements in the short-, mid-, and long-term. Project unit costs were used to estimate the capital cost of proposed collection system improvement projects and to develop the CIP budget associated with the CSMP recommended for adoption. Table 23 of the 2018 CSPFP lists the recommended projects for the collection system by the following broad improvement categories:

1. Trunk sewers and interceptors
2. South Lift Stations Impacting Amethyst/Mahogany Trunk Sewer
3. Older South and East Lift Station Capacity and Condition Improvements
4. Central Area Lift Station Condition and Capacity Improvements
5. West Area Lift Stations Impacting Newport Ave Trunk Sewer
6. North Area Lift Station Conditions and Decommissioning
7. Other North Area Lift Station Capacity and Condition Improvements
8. Programmatic Funding
9. Expansion Area Infrastructure

For each project, Table 23 provides a timeframe, describes type of improvement, a description, certain specifications (e.g. pipe length), and an estimate of project cost in 2017 dollars. Table 24 provides a summary of the capital improvement program costs for each improvement category by timeframe (Year 1 to 5, Year 6 to 10, and Year 11 to 20) and a total cost for the projects in the improvement category.

5. A public facility or service should not be provided in an urbanizable area unless there is provision for the coordinated development of all the other urban facilities and services appropriate to that area.

FINDING: The 2018 CSPFP shows that sewer collection service has been coordinated with the development and provision of other urban facilities and services for the Bend UGB. Goal 11 defines "urban facilities and services" as key facilities and appropriate types and levels of at least the following: police protection; sanitary facilities; storm drainage facilities; planning, zoning and subdivision control; health services; recreation facilities and services; energy and communication services; and community governmental services. The implementation of the 2018 CSPFP through construction of new facilities and improvements will be coordinated with other key facilities in the Bend UGB, including water and street construction. These projects will be coordinated

between the Engineering and Infrastructure Planning, Utilities, and Streets Departments.

6. All utility lines and facilities should be located on or adjacent to existing public or private rights-of-way to avoid dividing existing farm units.

FINDING: This guideline is not applicable as an approval criterion for the CSPFP. The following findings shows that sewer utilities such as force mains and interceptors will be located within public rights of way, with the exception of segments of the North Interceptor. This report includes findings that address OAR 660-011-0060 and show the segment of the North Interceptor developed outside the UGB in areas designated for agriculture will not divide existing farm units.

7. Plans providing for public facilities and services should consider as a major determinant the carrying capacity of the air, land and water resources of the planning area. The land conservation and development action provided for by such plans should not exceed the carrying capacity of such resources.

FINDING: The 2018 CSPFP relies on sewer collection plans designed to transport wastewater flows from the Bend UGB to the water reclamation facility on McGrath Road. The collection and treatment of effluent, as described in the 2014 CSPFP and in the 2008 PFP for the water reclamation facility, will ensure that the disposal of effluent will not impact the carrying capacity of the air, land, and water resources of the planning area[5].

CONFORMANCE WITH GOAL 11:

FINDING: Based on the above findings, the proposed Collection System PFP for the City of Bend is consistent with and implements Goal 11.

VII. Findings Addressing OAR 660-011, Public Facilities and Planning

660-011-0000 - Purpose

The purpose of this division is to aid in achieving the requirements of Goal 11, Public Facilities and Services, OAR 660-015-0000(11), interpret Goal 11 requirements regarding public facilities and services on rural lands, and implement ORS 197.712(2)(e), which requires that a city or county shall develop and adopt a public facility plan for areas within an urban growth boundary containing a population greater than 2,500 persons. The purpose of the plan is to help assure that urban development in such urban growth boundaries is guided and supported by types and levels of urban facilities and services appropriate for

[5] The WRF PFP was acknowledged in 2010. See Order 10-REMAND-PARTIAL ACKNOW-001795 http://www.oregon.gov/LCD/docs/general/bend_ugb/bend_ugb_lcdc_orderfinal_110210.pdf.

the needs and requirements of the urban areas to be serviced, and that those facilities and services are provided in a timely, orderly and efficient arrangement, as required by Goal 11. The division contains definitions relating to a public facility plan, procedures and standards for developing, adopting, and amending such a plan, the date for submittal of the plan to the Commission and standards for Department review of the plan.

FINDING: The requirements of OAR 660-011 are applicable to the development of the 2018 CSPFP because the City has a population of greater than 2,500 persons within its UGB. The following findings show the city has developed the 2018 CSPFP to ensure that future urban development is guided and supported by types and levels of urban sewer collection and treatment facilities, including those facilities that will serve development in the areas added to the UGB in 2016[6].

660-011-0010 - The Public Facility Plan

(1) The public facility plan shall contain the following items:

(a) An inventory and general assessment of the condition of all the significant public facility systems which support the land uses designated in the acknowledged comprehensive plan;

FINDING: The 2018 CSPFP satisfies this criterion because it includes an updated inventory and general assessment of the condition of the City's sewer collection systems. In general, the wastewater collection system consists of gravity pipelines, pressurized pipelines, manholes, lift stations, and force mains/common pressure mains. The following finding identifies the relevant tables in the 2018 CSPFP that provides the inventory and general assessment of condition of these public facilities.

For the gravity pipe system:

- Table 1 provides an inventory and general assessment
- Table 2 provides a material summary
- Table 3 provides material and diameter summary
- Tables 4 through 7 provide an assessment by category, age, size, and material.
- Figures 1 through 3 identify the existing system, pipe diameter, installation year, and gravity pipe material

For lift stations:

- Table 9 provides an inventory of lift stations and their characteristics
- Table 10 provides capacities for each lift station
- Table 11 summarizes the components considered in each assessment
- Table 12 identifies those lift stations that require significant improvements immediately

[6] See Ordinance 2271, and related exhibits amending the Bend Comprehensive Plan.

- Table 13 identifies those lift stations that require significant improvements in 5 years
- Table 14 identifies those lift stations that require significant improvements in 6 to 10 years
- Table 15 identifies those lift stations in Good Condition, Requiring No Major Improvements within 10 years
- Figure 6 identifies the service area with basins and a deficiency assessment that maps the data in Tables 12 through 15

For Vacuum Sewers:

- Table 16 provides an inventory of the vacuum sewer lines
- Figure 7 identifies those properties in Wood River Village that are served by the vacuum sewer lines

For force mains and common pressure mains:

- Tables 17 and 18 provide data on main diameter and material by installation year
- Table 19 provides a summary of material and diameter
- Figure 8 provides a map of the system of force mains by diameter
- Page 36, as indicated above, indicates the City does not have a program to inspect lines such as the force mains and common pressure mains

(b) A list of the significant public facility projects which are to support the land uses designated in the acknowledged comprehensive plan. Public facility project descriptions or specifications of these projects as necessary;

FINDING: The 2018 CSPFP meets this criterion because it includes lists of both short term and long term projects needed to support land uses in the acknowledged Bend Comprehensive Plan. The CSPFP provides a highlighted project summary and a brief description of each major project. A complete list of short-term and long term projects is provided in Table 23 and contains the list of projects, including a description and general time frame, by improvement type.

(c) Rough cost estimates of each public facility project;

FINDING: The 2018 CSPFP meets this criterion because it includes rough cost estimates for each project listed. The CSPFP provides a discussion of the City's proposed Capital Improvement Program for the Sewer Collection System. The detailed information regarding the various short and long-term projects is included in Table 23, with Table 24 providing the rough cost estimates for projects by improvement type and by time frame. The tables include a cost estimate for each project listed. 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. For the purpose of addressing this criterion, the City finds that the cost estimates provided in the 2018 CSPFP satisfy the definition of *"rough cost estimate"* under OAR 660-011-0005(2).

(d) A map or written description of each public facility project's general location or service area;

FINDING: The 2018 CSPFP meets this criterion because it includes a figure, a table, and written descriptions of each public facility project's general location. Figure 13 provides an overview of the Capital Improvement Project locations. These projects are listed in Table 23, and short descriptions of each project are provided between pages 50 and 54 of the 2018 CSPFP.

(e) Policy statement(s) or urban growth management agreement identifying the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated;

FINDING: The City has already addressed this criterion with the adoption of the 2014 CSPFP. There are no other sewer service providers within the City's UGB, nor are there any special districts or private utilities with which the City coordinates to provide wastewater collection and treatment. Therefore, an urban growth management agreement with other providers is not necessary. The Bend Comprehensive Plan contains several policies, including a policy statement that identifies the City as the sole sewer service provider for the current Bend UGB[7]. The existing and proposed policies are discussed in Section IX of these findings.

(f) An estimate of when each facility project will be needed; and

[7] See Policy 8-2 in Chapter 8, Public Facilities and Services, of the Comprehensive Plan.

FINDING: The 2018 CSPFP meets this criterion because it identifies the timing of each project. Table 23 of the 2018 CSPFP identifies the needed capital projects for the sewer collection system. This table also identifies the timing of these projects under OAR 660-011-025, and whether projects will be needed in the short-term, short to mid-term, or mid to long-term.

(g) A discussion of the provider's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each public facility project or system.

FINDING: The 2018 CSPFP meets this criterion because it includes a discussion of the City's existing funding mechanisms and the ability of these to fund the development of the needed projects (See pages 78 to 82). The CSPFP discusses the City's existing funding strategy and ability of these to fund improvements to the collection system and treatment plant. The goal of the City is to have a self-supported utility system where the rates and fees are set at a level sufficient to meet the annual costs. The City primarily relies on monthly uses fees and system development charges (SDCs) collected with new or increased development. The City has chosen to combine the wastewater collection system and the water reclamation facility under one fee structure rather than charging for wastewater collection separate from treatment.

(2) Those public facilities to be addressed in the plan shall include, but need not be limited to those specified in OAR 660-011-0005(5). Facilities included in the public facility plan other than those included in OAR 660-011-0005(5) will not be reviewed for compliance with this rule.

(3) It is not the purpose of this division to cause duplication of or to supplant existing applicable facility plans and programs. Where all or part of an acknowledged comprehensive plan, facility master plan either of the local jurisdiction or appropriate special district, capital improvement program, regional functional plan, similar plan or any combination of such plans meets all or some of the requirements of this division, those plans, or programs may be incorporated by reference into the public facility plan required by this division. Only those referenced portions of such documents shall be considered to be a part of the public facility plan and shall be subject to the administrative procedures of this division and ORS Chapter 197.

FINDING: This finding addresses (2) and (3) above. The 2018 CSPFP focuses on the wastewater collection systems intended to serve the Bend UGB. OAR 660-011-0005(1) defines a public facility plan as a support document or documents to a comprehensive plan. The CSPFP addressed here describes the sewer collection facilities that will support the land uses designated under the Bend Comprehensive Plan. OAR 660-011-0005(5) requires that the sewer system be included within a public facility plan. The plan refers to sewer planning documents prepared for the City that provide the information required for a public facility plan under OAR 660-011-0010(1) above. The 2018 CSPFP references those facilities intended to serve the Bend UGB.

660-011-0015 - Responsibility for Public Facility Plan Preparation

(1) Responsibility for the preparation, adoption and amendment of the public facility plan shall be specified within the urban growth management agreement. If the urban growth management agreement does not make provision for this responsibility, the agreement shall be amended to do so prior to the preparation of the public facility plan. In the case where an unincorporated area exists within the Portland Metropolitan Urban Growth Boundary which is not contained within the boundary of an approved urban planning area agreement with the County, the County shall be the responsible agency for preparation of the facility plan for that unincorporated area. The urban growth management agreement shall be submitted with the public facility plan as specified in OAR 660-011-0040.

FINDING: Pursuant to Section 3.3(d) of the Revised Joint Management Agreement Regarding the Area within the Bend Urban Growth Boundary, the City retains the authority to prepare and adopt public facility plans and amendments for utilities within the UGB and the Urbanizable Area (UA)[8]. Further, the proposed Collection System PFP specifies the City as the provider of sewer collection and treatment service in the Bend UGB. In addition, the City has also coordinated the amendment of the CSPFP with Deschutes County and special districts as required by OAR 660-011-015(2).

(2) The jurisdiction responsible for the preparation of the public facility plan shall provide for the coordination of such preparation with the city, county, special districts and, as necessary, state and federal agencies and private providers of public facilities. The Metropolitan Service District is responsible for public facility plans coordination within the District consistent with ORS 197.190 and 268.390.

FINDING: The proposed CSPFP meets this criterion because City has coordinated with affected governmental units. The City identified the following as the affected governmental units, and requested their comments and input through direct email communication. The following describes the affected government units with which the City has coordinated, and where applicable, the agency's response to the request for comments.

Bend LaPine School District. City staff met with District staff during an April 17, 2018 meeting. District staff had no further comments or questions after this meeting.

Bend Parks and Recreation District. The District indicated they had no comments through an April 25, 2018 email.

[8] The UA or Urbanizable Area, was identified and zoned as such through Ordinance NS-2293 on June 21, 2017.

Deschutes County Community Development and Road Departments. The Community Development Department stated that they had no comments through an April 25, 2018 email. The Road Department provided no comments.

North Unit Irrigation District. The District did not provide any comments on the draft PFP, but did send along several questions in a May 2, 2018 email.

Oregon Department of Transportation (ODOT), Region 4. ODOT provided the comments through an April 27, 2018 email.

Swalley Irrigation District. The District provided comments through an April 24, 2018 email, and also provided a map that identified the District's facilities – e.g. canals and laterals, that would be crossed with one or more proposed sewer interceptors.

The City also requested comments from the Arnold, Central Oregon, and Tumalo Irrigation Districts. The City provided geographic information system (GIS) data and files to all three of these districts as requested. None of the districts provided any comments on the draft PFP.

(3) Special districts, including port districts, shall assist in the development of the public facility plan for those facilities they provide. Special districts may object to that portion of the facilities plan adopted as part of the comprehensive plan during review by the Commission only if they have completed a special district agreement as specified under ORS 197.185 and 197.254(3) and (4) and participated in the development of such portion of the public facility plan.

FINDING: This rule is not applicable because there are no sanitary districts organized under ORS 450 that provide sewer service to areas within the Bend UGB. Goal 11 defines a sanitary sewer system to include a primary collection system and a treatment facilities system. The private systems in the Bend UGB for collection and treatment of effluent are private on-site sewage disposal systems for individual dwellings.

(4) Those state agencies providing funding for or making expenditures on public facility systems shall participate in the development of the public facility plan in accordance with their state agency coordination agreement under ORS 197.180 and 197.712(2)(f).

FINDING: This rule is not applicable because no state agencies are providing funding for or making expenditures on the sewer public facility systems that are the subject of this plan adopted by this ordinance.

660-011-0020 - Public Facility Inventory and Determination of Future Facility Projects

(1) The public facility plan shall include an inventory of significant public facility systems. Where the acknowledged comprehensive plan, background document or one or more of the plans or programs listed in OAR 660-011-0010(3) contains such an inventory, that inventory may be incorporated by reference. The inventory shall include:

(a) Mapped location of the facility or service area;

(b) Facility capacity or size; and

(c) General assessment of condition of the facility (e.g., very good, good, fair, poor, very poor).

FINDING: The 2018 CSPFP meets this criterion because it includes several tables that present an inventory of the significant public facility systems that constitute the wastewater collection system. These tables include an inventory of facilities, their capacity, size or length, and for several a general assessment of condition of the facility. The City maintains a system of vacuum sewer lines, force mains, and pressure mains for which the City does not have an assessment or evaluation program, and therefore has no data on their condition.

Gravity Pipes. Tables 1 through 3 provide this information and an assessment for the gravity pipes. These tables provide the inventory pipes by dimensions and material. Tables 5 through 7 provide a general assessment of pipes by category, age, size, and material, and rely on an assessment scale of 1 to 5 for rating the condition of the pipe. Table 4 provides the description of the ratings themselves. Figures 1 through 4 show the existing pipe system by diameter, the installation year, gravity pipe material, and assessment. Each figure shows the system within the current Bend UGB.

Lift Stations. Table 9 provides the inventory of lift stations by basin, with Table 10 providing the capacities of the lift stations. Tables 11 through 14 provide the assessment summary for lift stations with the assessment identifying lift stations by needing significant improvements immediately, within 5 years, or within 6 to 10 years. Table 15 identifies those lift stations that are in Good Condition and that will require no major improvements within 10 years. Figure 5 shows the existing system service area and basins served by lift stations. Figure 6 displays the deficiency assessment for the lift stations.

Vacuum Sewers. Table 16 provides the inventory of pipes in the vacuum sewer system, including diameter and length. As indicated above, the City does not have an assessment program for pipes in the vacuum system. Figure 7 identifies the location of the vacuum sewer lines and the area that they serve.

Force Mains/Common Pressure Mains. Tables 17, 18, and 19 present the inventory of mains by installation year, diameter, and material. Like the vacuum sewers, the City does not have an assessment program for evaluating the condition of force mains and

common pressure mains. Figure 8 presents the inventory of the existing system of mains by pipe diameter.

(2) The public facility plan shall identify significant public facility projects which are to support the land uses designated in the acknowledged comprehensive plan. The public facility plan shall list the title of the project and describe each public facility project in terms of the type of facility, service area, and facility capacity.

FINDING: The 2018 CSPFP meets this criterion because it includes proposed changes to the City's Capital Improvement Program (CIP) which identifies the significant public facility projects for the collection system. The CIP organizes projects according to the following categories:

1. Trunk Sewer and Interceptor Improvements
2. Southeast Lift Station Condition and Decommissioning Improvements
3. South Lift Station Capacity and Condition Improvements impacting the Amethyst/Mahogany/3rd Street Trunk Sewer
4. Other South and East Area Lift Station Condition Improvements
5. Central Area Lift Station Capacity and Condition Improvements
6. West Lift Station Capacity and Condition Improvements
7. North Lift Station Condition and Decommissioning Improvements
8. Other North Area Lift Station Capacity and Condition Improvements
9. Programmatic Funding
10. Expansion Area Infrastructure.

The PFP provides a brief written description for each category on pages 49 and 50.

These ten (10) categories of public facility projects are planned to support land uses designated in the Bend Comprehensive Plan. The 2018 CSPFP identifies several major projects that will be undertaken and contains a project summary of highlighted significant projects in the short term, short to mid-term, and mid to long-term. A complete list of the Capital Improvement Projects planned for the 20-year planning period is shown in Table 23 of the CSPFP.

(3) Project descriptions within the facility plan may require modifications based on subsequent environmental impact studies, design studies, facility master plans, capital improvement programs, or site availability. The public facility plan should anticipate these changes as specified in OAR 660-011-0045.

FINDING: This rule is not a criterion for approval for the 2018 CSPFP. This report addresses OAR 660-011-045 in a subsequent finding.

660-011-0025 - Timing of Required Public Facilities

(1) The public facilities plan shall include a general estimate of the timing for the planned public facility projects. This timing component of the public facilities plan can be met in several ways depending on whether the project is anticipated in the short term or long term. The timing of projects may be related directly to population growth, e.g., the expansion or new construction of water treatment facilities. Other facility projects can be related to a measure of the facility's service level being met or exceeded, e.g., a major arterial or intersection reaching a maximum vehicle-per-day standard. Development of other projects may be more long term and tied neither to specific population levels nor measures of service levels, e.g., sewer projects to correct infiltration and inflow problems. These projects can take place over a long period of time and may be tied to the availability of long-term funding. The timing of projects may also be tied to specific years.

(2) Given the different methods used to estimate the timing of public facilities, the public facility plan shall identify projects as occurring in either the short term or long term, based on those factors which are related to project development. For those projects designated for development in the short term, the public facility plan shall identify an approximate year for development. For those projects designated for development over the long term, the public facility plan shall provide a general estimate as to when the need for project development would exist, e.g., population level, service level standards, etc. Timing provisions for public facility projects shall be consistent with the acknowledged comprehensive plan's projected growth estimates. The public facility plan shall consider the relationships between facilities in providing for development.

(3) Anticipated timing provisions for public facilities are not considered land use decisions as specified in ORS 197.712(2)(e), and, therefore, cannot be the basis of appeal under ORS 197.610(1) and (2) or 197.835(4).

FINDING: This finding addresses OAR 660-011-0025(1) through (3). The 2018 CSPFP meets (1) through (3) above because it includes a general estimate of timing for all capital improvement projects. Table 23 of the CSPFP identifies projects as to whether they will be needed in the short term (1 to 5 years), short to mid-term (1 to 5 or 6 to 10 years), or mid to long term (6 to 10 years or 11 to 20 years). The CSPFP also includes brief written descriptions of the projects on pages 50 through 54. Figure 13 of the CSPFP is a map all of the significant capital improvement projects.

Short term projects are considered to be those projects that will be undertaken in 1 to 5 years. The short term projects include:

1. North Interceptor Phase 1
2. Southeast Interceptor Extension and Diversion

3. Southeast Lift Station Decommissioning
4. Drake Lift Station and Force main

Short to Mid-Term projects are those projects that are development driven, and may be completed in either the short term (1 to 5 years) or mid-term (6 to 10 years). These projects include:

1. Amethyst/Mahogany/3rd Street Trunk
2. River Rim Lift Station
3. 8th to 15th Street Trunk
4. Newport Trunk, Shevlin Commons Lift Station, Shevlin Meadows Lift Station and Force main, and Renaissance Lift Station
5. Deschutes Business Lift Station
6. North Interceptor Phase 2
7. North Area Lift Station Decommissioning
8. North Interceptor Phase 3
9. Old Mill Lift Station and Force main
10. East Interceptor Phase 1

Mid to Long Term Projects are those that are also development driven, and will be needed in either the mid-term (6 to 10 years) or the long term (11 to 20 years). These projects are described on pages 52-53 and include:

1. Drake Downstream Trunk
2. Central Interceptor
3. East Interceptor Phase 2

UGB Expansion Area Projects are those that are intended to serve specific UGB Expansion Areas, are development driven. These projects are estimated to be need in either the short- or mid-term, when the City approves either an area plan or a master plan for an expansion area. These projects include:

1. Elbow Gravity Trunk
2. Elbow Lift Station and Force main
3. DSL Gravity Trunk
4. Thumb Gravity Trunks
5. West Gravity Trunks

Other Projects is a final category of projects that are other than short-, mid-, and long-term projects required to accommodate system growth and maintain system condition. These projects are described on pages 53-54 and include:

1. Condition Related Lift Station Improvements
2. Condition Assessment, Sewer Flow Monitoring, Modeling, and Planning Projects
3. Pipeline Repair and Replacement Program
4. Local Area Improvements

5. Plant Interceptor Rehabilitation (lower portion)

Table 23 lists the projects by improvement category, and includes their respect timeframe, specifications, and project cost estimates. Table 24 lists the total costs for each category of improvement and by their timeframe.

660-011-0030 - Location of Public Facility Projects

(1) The public facility plan shall identify the general location of the public facility project in specificity appropriate for the facility. Locations of projects anticipated to be carried out in the short term can be specified more precisely than the locations of projects anticipated for development in the long term.

FINDING: The 2018 CSPFP meets this criterion because it includes maps that identify the general location of public facility projects. The CSPFP provides a summary of both short-term and long-term projects including the general location of sewer public facilities. Figure 13 of the Collection System PFP provides the mapped location of all proposed capital improvement projects. Table 23 provides a description of each project including the project category, type of improvement, size, length and project estimate.

(2) Anticipated locations for public facilities may require modifications based on subsequent environmental impact studies, design studies, facility master plans, capital improvement programs, or land availability. The public facility plan should anticipate those changes as specified in OAR 660-011-0045.

FINDING: The 2018 CSPFP relies on sewer planning documents for the City that acknowledge that additional design work and studies will be required before the city develops a final design and location for specific facilities.

660-011-0035 - Determination of Rough Cost Estimates for Public Facility Projects and Local Review of Funding Mechanisms for Public Facility Systems

(1) The public facility plan shall include rough cost estimates for those sewer, water, and transportation public facility projects identified in the facility plan. The intent of these rough cost estimates is to:

(a) Provide an estimate of the fiscal requirements to support the land use designations in the acknowledged comprehensive plan; and
(b) For use by the facility provider in reviewing the provider's existing funding mechanisms (e.g., general funds, general obligation and revenue bonds, local improvement district, system development charges, etc.) and possible alternative funding mechanisms. In addition to including rough cost estimates for each project, the facility plan shall include a discussion of the provider's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each public facility

project or system. These funding mechanisms may also be described in terms of general guidelines or local policies.

FINDING: The proposal meets this criterion because the 2018 CSPFP includes rough cost estimates for the sewer collection projects identified in the plan. The CSPFP relies on Class V costs estimates as rough cost estimates for the projects in the CIP. Table 23 of the PFP provides rough cost estimates for projects. Table 24 aggregates this data to the 10 improvement categories used in the PFP and provides total estimates by improvement category, by timeframe, and then a total rough cost estimate for all the projects in the PFP. The project estimates will change over time due to fluctuations in actual labor and material costs, competitive market conditions, site conditions, final project scope, implementation schedule, continuity of personnel, and other unforeseeable factors.

(2) Anticipated financing provisions are not considered land use decisions as specified in ORS 197.712(2)(e) and, therefore, cannot be the basis of appeal under ORS 197.610(1) and (2) or 197.835(4).

FINDING: This rule is not an approval criterion for the proposal.

660-011-0040 - Date of Submittal of Public Facility Plans

The public facility plan shall be completed, adopted, and submitted by the time of the responsible jurisdiction's periodic review. The public facility plan shall be reviewed under OAR Chapter 660, Division 25, "Periodic Review" with the jurisdiction's comprehensive plan and land use regulations. Portions of public facility plans adopted as part of comprehensive plans prior to the responsible jurisdiction's periodic review will be reviewed pursuant to OAR Chapter 660, Division 18, "Post Acknowledgment Procedures".

FINDING: The proposed 2018 CSPFP will be reviewed and adopted as a post-acknowledgement plan amendment. This amendment will include adoption of the 2018 CSPFP, and related amendments to Chapter 8 of the Bend Comprehensive Plan, *Public Facilities and Services*, to recognize and incorporate the plan and as the PFP for sewer collection and adopt new policies to implement the PFP.

660-011-0045 - Adoption and Amendment Procedures for Public Facility Plans

(1) The governing body of the city or county responsible for development of the public facility plan shall adopt the plan as a supporting document to the jurisdiction's comprehensive plan and shall also adopt as part of the comprehensive plan:

(a) The list of public facility project titles, excluding (if the jurisdiction so chooses) the descriptions or specifications of those projects;

(b) A map or written description of the public facility projects' locations or service areas as specified in sections (2) and (3) of this rule; and

(c) The policy(ies) or urban growth management agreement designating the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated.

FINDING: This finding addresses (1)(a) through (1)(c) above. The proposal before the City Council is to adopt the 2018 CSPFP as a supporting document to the Bend Comprehensive Plan. This proposal also includes adoption of related and conforming amendments to Chapter 8 of the Bend Comprehensive Plan, *Public Facilities and Services*, to include the 2018 CSPFP. The amendments to Chapter 8 will list the titles of the significant public facility projects intended to serve the Bend UGB. The CSPFP includes Figure 5 which identifies the City's sewer service area and sewer basins, and identifies the areas included in the 2016 UGB Expansion. Finally, the CSPFP describes the City as the sole wastewater collection and treatment service provider within the Bend UGB. The proposed amendments to Chapter 8 include new text and new policies for Sewer Collection Facilities. These new policies include Policies 8-13 and 8-14 regarding the location of sewer collection facilities outside of the UGB. These criteria have been satisfied.

(2) Certain public facility project descriptions, location or service area designations will necessarily change as a result of subsequent design studies, capital improvement programs, environmental impact studies, and changes in potential sources of funding. It is not the intent of this division to:

(a) Either prohibit projects not included in the public facility plans for which unanticipated funding has been obtained;
(b) Preclude project specification and location decisions made according to the National Environmental Policy Act; or
(c) Subject administrative and technical changes to the facility plan to ORS 197.610(1) and (2) or 197.835(4).

FINDING: This rule is not an approval criterion. The City understands that certain elements of projects listed in the 2018 CSPFP plans may change, and that such changes are not subject to ORS 197.610(1) or (2) or 197.835(4).

(3) The public facility plan may allow for the following modifications to projects without amendment to the public facility plan:

(a) Administrative changes are those modifications to a public facility project which are minor in nature and do not significantly impact the project's general description, location, sizing, capacity, or other general characteristic of the project;

(b) Technical and environmental changes are those modifications to a public facility project which are made pursuant to "final engineering" on a project or those that result from the findings of an Environmental Assessment or Environmental Impact Statement conducted under regulations implementing the procedural provisions of the National Environmental Policy Act of 1969 (40 CFR Parts 1500-1508)or any federal or State of Oregon agency project development regulations consistent with that Act and its regulations.

(c) Public facility project changes made pursuant to subsection (3)(b) of this rule are subject to the administrative procedures and review and appeal provisions of the regulations controlling the study (40 CFR Parts 1500-1508 or similar regulations) and are not subject to the administrative procedures or review or appeal provisions of ORS Chapter 197, or OAR Chapter 660 Division 18.

FINDING: This rule is not an approval criterion. The City understands that certain elements of projects listed in the water and/or sewer public facility plans may change. This rule defines what changes are not subject to ORS Chapter 197 or OAR Chapter 660 Division 18.

4) Land use amendments are those modifications or amendments to the list, location or provider of, public facility projects, which significantly impact a public facility project identified in the comprehensive plan and which do not qualify under subsection (3)(a) or (b) of this rule. Amendments made pursuant to this subsection are subject to the administrative procedures and review and appeal provisions accorded "land use decisions" in ORS Chapter 197 and those set forth in OAR Chapter 660 Division 18.

FINDING: This rule is not an approval criterion; however, the city acknowledges that the city's adoption of this ordinance amending the plans is subject to the review and appeal procedures accorded "land use decisions" in ORS Chapter 197 and those set forth in OAR Chapter 660 Division 18. As indicated above, the City will submit this proposal to the Department of Land Conservation and Development as a post-acknowledgement plan amendment under OAR 660-018.

660-011-0060

Sewer Service to Rural Lands

(1) As used in this rule, unless the context requires otherwise:

(a) "Establishment of a sewer system" means the creation of a new sewage system, including systems provided by public or private entities;

(b) "Extension of a Sewer System" means the extension of a pipe, conduit, pipeline, main, or other physical component from or to an existing sewer system in order to provide service to a use, regardless of whether the use is inside the

service boundaries of the public or private service provider. The sewer service authorized in section (8) of this rule is not an extension of a sewer;

(c) "No practicable alternative to a sewer system" means a determination by the Department of Environmental Quality (DEQ) or the Oregon Health Division, pursuant to criteria in OAR chapter 340, division 71, and other applicable rules and laws, that an existing public health hazard cannot be adequately abated by the repair or maintenance of existing sewer systems or on-site systems or by the installation of new on-site systems as defined in OAR 340-071-0100;

(d) "Public health hazard" means a condition whereby it is probable that the public is exposed to disease-caused physical suffering or illness due to the presence of inadequately treated sewage;

(e) "Sewage" means the water-carried human, animal, vegetable, or industrial waste from residences, buildings, industrial establishments or other places, together with such ground water infiltration and surface water as may be present;

(f) "Sewer system" means a system that serves more than one lot or parcel, or more than one condominium unit or more than one unit within a planned unit development, and includes pipelines or conduits, pump stations, force mains, and all other structures, devices, appurtenances and facilities used for treating or disposing of sewage or for collecting or conducting sewage to an ultimate point for treatment and disposal. The following are not considered a "sewer system" for purposes of this rule:

(A) A system provided solely for the collection, transfer and/or disposal of storm water runoff;

(B) A system provided solely for the collection, transfer and/or disposal of animal waste from a farm use as defined in ORS 215.303.

FINDING: This finding addresses subsection (1) of OAR 660-011-0060 above. The amendments to the 2018 CSPFP include two (2) new sewer collection interceptors that need to be located outside of the Bend UGB to better serve lands within the UGB. These are identified as the North Interceptor (Phases 1 through 3) and the East Interceptor (Phases 1 and 2). The following findings show these interceptors are required to provide sewer collection service to several expansion areas and transport of wastewater to the City's WRF, and that they must be located outside of the Bend UGB in order to do so.

(2) Except as provided in sections (3), (4), (8), and (9) of this rule, and consistent with Goal 11, a local government shall not allow:

(a) The establishment of new sewer systems outside urban growth boundaries or unincorporated community boundaries;

(b) The extension of sewer lines from within urban growth boundaries or unincorporated community boundaries in order to serve uses on land outside those boundaries;

(c) The extension of sewer systems that currently serve land outside urban growth boundaries and unincorporated community boundaries in order to serve uses that are outside such boundaries and are not served by the system on July 28, 1998.

FINDING: This finding addresses subsection (2) of OAR 660-011-0060. With respect to (2)(a) and (2)(b) above, the proposed 2018 CSPFP does not propose to establish a new sewer system outside the City's UGB. There are no unincorporated community boundaries adjacent to or affected by the proposed amendments to the City's CSPFP[9].

For context, these criteria are applicable because the 2018 CSPFP proposes two (2) sewer interceptor projects that would be located outside of the Bend UGB, and constructed to transport wastewater from the UGB to the City's water reclamation facility (WRF) on McGrath Road. The WRF is located on a 1,600-acre site approximately two miles north and east of the City. The City obtained a conditional use permit to establish the facility, CU-77-71, in 1977. The WRF has been operating since 1981.

One of these interceptors is identified as the North Interceptor, and includes three (3) segments or phases that extend from the WRF west to the OB Riley Expansion area (See Figure 13 of the PFP). These segments total approximately 40,500 linear feet of pipe[10]. Once constructed, the OB Riley Expansion Area, North Triangle Expansion Area, Juniper Ridge, and areas of Northeast Bend will have access to a sewer interceptor that relies on gravity to direct flows of wastewater to the WRF. The proposed phasing of construction proceeds in an east to west direction from the WRF to the OB Riley Expansion Area.

The second interceptor is the East Interceptor. The 2014 CSPFP included an alignment for the Southeast Interceptor that was located within the existing UGB. The 2018 CSPFP includes construction of a new interceptor, identified as the East Interceptor, that would replace a segment of the Southeast Interceptor. This new interceptor would transport wastewater from the Thumb, Elbow, DSL, and Northeast Edge Expansion Areas. This interceptor would be constructed in two phases, in a north to south direction, with a total pipe length of 23,100 linear feet[11]. Phase 1 of the East Interceptor would provide wastewater collection for the Northeast Edge. Phase 2 of the East Interceptor would provide wastewater collection for the other expansion areas identified above. Each of these phases of the East Interceptor would be located outside of the UGB, with most of the segments located within public rights of way.

[9] See Deschutes County Official Zoning Map – https://www.deschutes.org/cd/page/mappinggis.
[10] See Table 23, pages 55-56 for unit lengths of each phase.
[11] See Table 23, page 56 for unit lengths of each phase.

(3) Components of a sewer system that serve lands inside an urban growth boundary (UGB) may be placed on lands outside the boundary provided that the conditions in subsections (a) and (b) of this section are met, as follows:

(a) Such placement is necessary to:

(A) Serve lands inside the UGB more efficiently by traversing lands outside the boundary;

****

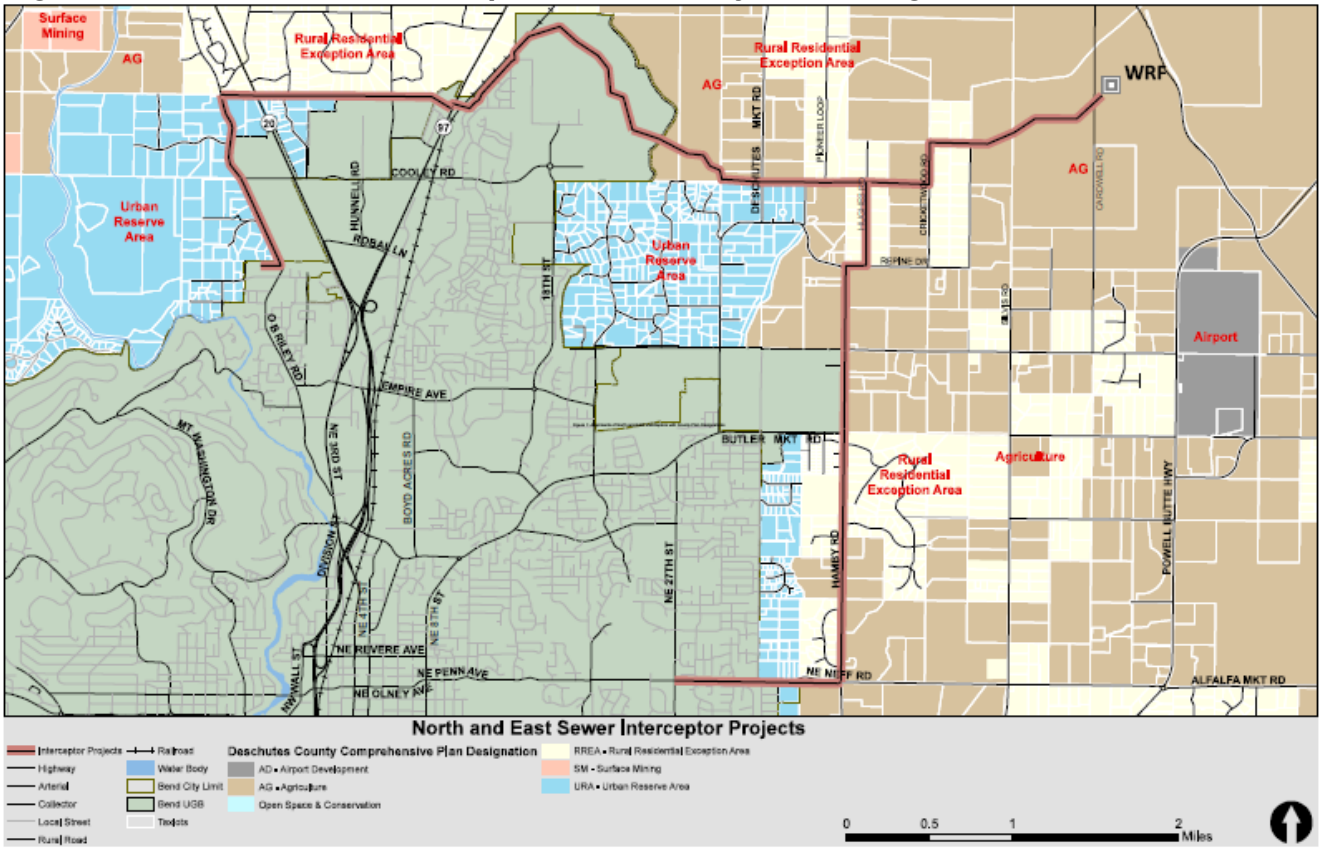
(C) Connect to components of the sewer system lawfully located on rural lands, such as outfall or treatment facilities; or

****

FINDING: This finding addresses (3)(a)(A) and (3)(a)(C) above. The City proposes to establish two sewer collection facilities, the East Interceptor and the North Interceptor, on lands outside of the Bend UGB. Each interceptor would have segments that would be constructed on lands either outside the UGB or within the public rights of way outside the UGB. The 2018 CSPFP (See Figure 13) shows the proposed segments of each interceptor constructed outside of the UGB. The City has relied on technical memoranda identified in Section V of this report that provide the analysis supporting the improved performance of these interceptors in transporting effluent to the City's wastewater treatment facility, which is located outside of the City's UGB[12].

[12] See July 20, 2016 technical memorandum "UGB Expansion-Sanitary Sewer Analysis, Scenario 2.1G" and October 14, 2016 technical memorandum "UGB Expansion-Sanitary Sewer Analysis-Long Term Optimization" by MurraySmith.

Figure 1: North and East Interceptors and County Plan Designations



The preceding map (Figure 1) shows the alignments of the North and East interceptors in relation to the comprehensive plan designation of the lands through which they travel[13].

The City's water reclamation facility (WRF) is located outside of the Bend UGB approximately two miles to the north and east. Two of the interceptors proposed in the CSPFP were either considered in the 2014 CSMP and proposed here with new dimensions or considered during the UGB evaluation process as a project that would be needed to serve new areas included in the UGB[14].

The North Interceptor was included in the 2014 CSMP and previously described as the Northeast Interceptor. The 2018 SPFP proposes an extension of the project further to the west and is further amended to provide additional capacity for the north and west expansion areas[15].

[13] A larger version of this map is attached at the end of this report.
[14] See July 20, 2016 technical memorandum "UGB Expansion – Sanitary Sewer Analysis, Scenario 2.1G"
[15] See page 25 of 26, October 14, 2016 MSA memorandum

The North Interceptor has three phases, each of which in whole or in part are located outside of the UGB, but provide wastewater collection for two UGB expansion areas. The interceptor also provides additional sewer capacity for infill in the north and northeast areas of Bend. In addition, this interceptor provides a redundancy in the City's wastewater collection system by providing another facility for transporting wastewater flows from inside the UGB to the City's WRF. Phase 1 of the North Interceptor provides the redundancy and diverts existing wastewater flows from the Plant Interceptor. Phase 2 of the North Interceptor extends west from the point where the existing Plant Interceptor connects with Phase 1 of the North Interceptor to provide sewer service to Juniper Ridge, one of the City's industrial areas inside the UGB and a key location of industrial employment. Phase 2 of the North Interceptor travels through land outside the UGB west to Juniper Ridge, travels further west through Juniper Ridge, and then terminates at a point near Highway 97. Roughly half of Phase 2 of the North Interceptor is in the UGB. Phase 3 of the North interceptor begins where Phase 2 terminates in the UGB and travels west where it crosses Highways 97 and 20 before connecting with a sewer line in OB Riley Road. Phase 3 provides wastewater collection for both the North Triangle Expansion Area and the OB Riley Expansion Area.

The proposed East Interceptor was previously considered a segment of the Southeast Interceptor Project. A subsequent optimization analysis found that the optimal alignment for this same segment changed from 27th Street to Hamby Road to the east. This new alignment provides for gravity service to properties east of 27th Street, and parallels sections of the existing Plant Interceptor[16]. In the technical memoranda listed in Section V, the East Interceptor is referred to as the Hamby alignment of the Southeast Interceptor. These memoranda concluded moving the alignment of this interceptor to Hamby Road allowed for gravity service to be provided to properties east of 27th Street. This alignment also parallels sections of the existing Plant Interceptor that would otherwise require significant capacity improvements to serve long-term growth.

The East Interceptor provides wastewater collection for the UGB expansion areas located on Bend's south and east side including the Thumb, the Elbow, the DSL Property, and the Northeast Edge. Phase 1 of the East Interceptor begins at a point where it connects to Phase 1 of the North Interceptor and travels south along the eastern edge of the Northeast Edge where it terminates at this expansion areas southeast corner. Phase 2 of the East Interceptor begins at this point, traveling south within the right of way of Hamby Road before traveling west at Neff Road to a point where it would connect with the Southeast Interceptor within the UGB. Phases 1 and 2 of the East Interceptor also divert some flows from the existing system and provide additional capacity for wastewater flows in the DSL Expansion Area, and for part of the Thumb Expansion Areas. The East Interceptor further supports development in the south part of the UGB by providing capacity for some infill.

[16] See October 14, 2016 technical memorandum "UGB Expansion – Sanitary Sewer Analysis – Long Term Optimization."

The City has relied on technical memoranda (See Section V) that concluded the North Interceptor is the project through which wastewater can be effectively transported to the WRF for the OB Riley and North Triangle Expansion Areas. This interceptor also helps divert flows from areas of Northeast Bend, and provides the opportunity to decommission nine (9) pumping stations in this area. The July and October 2016 technical memoranda concluded that amended alignments for the North Interceptor (referred to as the Northeast Interceptor in these documents), bypasses the existing Plant Interceptor and connects with the Hamby alignment of the Southeast Interceptor (aka East Interceptor). In addition, the North Interceptor proposes to include a diversion structure where flows from the existing Plant Interceptor can be diverted and conveyed directly to the WRF, providing a valuable redundancy for existing poor condition and near capacity interceptor piping[17].

The technical memoranda in Section V also show the East Interceptor is a more effective project to provide sewer collection for the Northeast Edge, and for the expansion areas in the southeast. Each interceptor would provide for gravity flow of wastewater from areas within the UGB to the City's wastewater reclamation facility, which has been lawfully established on land outside of the UGB. Moving the interceptor to Hamby Road allows for more efficient gravity flow of wastewater to the intersection of the East Interceptor with the North Interceptor, which also relies on gravity to direct wastewater to the WRF.

One of the key reasons for locating these facilities outside of the UGB is that each interceptor serves areas recently added through the 2016 UGB expansion. The proposed routes are outside of the UGB to support gravity flows of wastewater to the WRF. In addition, the WRF itself was lawfully established outside of the UGB in 1977[18].

Based on the forgoing, the City concludes that the proposed CSPFP meets these criteria for establishing sewer facilities outside of the Bend UGB, and that their development and location outside of the UGB will better serve areas inside the UGB.

(b) The local government:

(A) Adopts land use regulations to ensure the sewer system shall not serve land outside urban growth boundaries or unincorporated community boundaries, except as authorized under section (4) of this rule; and

(B) Determines that the system satisfies ORS 215.296(1) or (2) to protect farm and forest practices, except for systems located in the subsurface of public roads and highways along the public right of way.

[17] See page 9, July 20, 2016 technical memorandum, and page 25 of October 14, 2016 memorandum listed in Section V.
[18] See CU-77-71, available to download from DevDocs portal of the Community Development Department website - https://www.deschutes.org/cd/page/development-documents-devdocs.

FINDING: This finding addresses (b)(A) and (b)(B) above. The forgoing findings addressing (3)(a)(A) and (3)(a)(C) of OAR 660-011-0060 refer to elements of the 2018 CSPFP that include construction of two (2) sewer interceptor lines on lands outside of the Bend UGB, to better serve those lands within the Bend UGB. With respect to (3)(b)(A), the City has already adopted land use regulations to ensure the City's sewer collection system does not serve these land outside of the Bend UGB. There are several developments outside of the UGB that currently receive sewer collection service from the City. These include a Goal 8 destination resort, and a resort community designated by the County under OAR 660-022[19]. The proposed interceptor has not been designed and will not be established to provide new sewer service to these areas.

On January 3, 2018, the Bend City Council adopted Ordinance 2302. Through this ordinance, the City adopted a number of changes to the Bend Development Code (BDC), which also contains the City's land use regulations. Exhibit A to Ordinance 2302 included a new (E) under BDC 3.4.400, Sanitary Sewer and Water Improvements.

> *E. Sewer Collection Service outside the Bend Urban Growth Boundary (UGB). The City may establish sewer collection or treatment facilities outside the Bend UGB, including, but not limited to, the extension of sewer interceptor lines to serve lands in the UGB more efficiently by traversing outside the Bend UGB, or to connect to treatment facilities outside of the Bend UGB. Service connections to these facilities may only be allowed in cases where either the Oregon Department of Environmental Quality or Oregon Health Division determines a public health hazard exists and service is provided consistent with the Oregon Administrative Rules, 660-011*.

The City finds that adding this language will ensure that sewer interceptor lines proposed through this PFP amendment cannot be used to serve land outside of the Bend UGB, and only if such a connection is preceded by a determination by either the DEQ or Oregon Health Division (OHD) that a health hazard exists.

The City further proposes to add two policies to Chapter 8 of the Comprehensive Plan, *Public Facilities and Services*, to support this regulation:

8-13 *The City may establish wastewater collection facilities such as sewer interceptor lines, outside of the Bend UGB, to better serve the land inside the UGB.*

8-14 *The City may allow lands outside the UGB to connect to sewer collection facilities located outside of the UGB in order to mitigate a public health hazard,*

[19] The Goal 8 destination resort is Tetherow, which received approvals from Deschutes County in 2004 and 2005. The resort communities are the Inn at the 7th Mountain and Widgi Creek, which have been operating since 1972 and 1989, respectively.

and in a manner consistent with state administrative rules that implement a statewide planning goal concerning public facilities and services.

With respect to (3)(b)(B), the proposed alignment for the East Interceptor shows it will be located within the public rights of way of Neff Road, Hamby Road, Hamehook Road, and Hughes Road. This alignment intersects with the proposed alignment of Phase 1 of the North Interceptor, which then proceeds east to the wastewater reclamation facility (WRF). This phase of the North Interceptor will be constructed within a combination of public rights of way and easements that cross private land. Because Phases 1 and 2 of the North Interceptor will be located outside of the public right of way, and through areas plan designated Agriculture and zoned EFUTRB, the City finds that the following standards in ORS 215.296 must be addressed.

215.296 Standards for approval of certain uses in exclusive farm use zones; violation of standards; complaint; penalties; exceptions to standards.

(1) A use allowed under ORS 215.213 (2) or (11) or 215.283 (2) or (4) may be approved only where the local governing body or its designee finds that the use will not:

(a) Force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use; or

(b) Significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use.

Based on the forgoing findings, the City has concluded that the East Interceptor, both Phases 1 and 2, will be located within the road rights of way of Neff, Hamby, and Hughes Roads. These above cited criteria from ORS 215.296 apply to review of Phases 1 and 2 of the North Interceptor. There are two phases of the North Interceptor that will be constructed outside of the Bend UGB and outside of a road right of way (See (3)(b)(B) above). One segment Phase 1 of the North Interceptor will be constructed from the WRF to a section that crosses rural residential exception area located between Cricketwood and Gentry Loop Roads. A final segment of Phase 1 travels west from Cricketwood to the eastern boundary of rural residential exception area that abuts Hughes Road. A segment of Phase 2 of the North Interceptor begins at the western boundaries of properties abutting Hughes Road, and proceeding west to a point where it reaches the UGB. The rest of this finding addresses how these segments of the North Interceptor satisfy ORS 296(1) and (2).

The segments of the North Interceptor that travel through resource land will not force a significant change in accepted farm practices on surrounding lands devoted to farm use. For the purpose of addressing ORS 215.296(1)(a) above, the City notes that none of the area surrounding the interceptor alignment is planned and zoned for forest uses.

The alignment of the North Interceptor crosses both resource lands and lands for which the County has adopted exceptions to Goals 3 (Agricultural Lands) and 4 (Forest Lands). These lands are zoned either Multiple Use Agricultural (MUA10), Exclusive

Farm Use-Tumalo/Redmond/Bend subzone (EFUTRB), or Exclusive Farm Use-Alfalfa subzone. During a site visit on April 13, 2018, staff noted that farm practices in the area north and south of the alignment included some livestock grazing (cattle), and irrigated pasture. The properties on either side of Pioneer Loop, and on the east side of Cricketwood Drive are designated rural residential exception areas. The farming practices observed were south of Phase 2 of the North Interceptor. Phase 1 of the North Interceptor will be constructed through designated agricultural lands that are developed with residences, not engaged in farm practices, or covered with a juniper woodland with an understory of native sage brush and bitter brush.

The proposed sewer interceptor line will not force a significant change in accepted farm practices because it will be constructed underground to allow for gravity conveyance of wastewater to the City's WRF. The line itself does not require the use of groundwater or a diversion from the Deschutes River to operate. The location of the line underground does not have any operating characteristics such as noises, odors, or vibrations that would interfere with accepted farming practices in the area. These practices are limited to livestock grazing and irrigated pasture.

The proposed sewer interceptor line will also not significantly increase the cost of accepted farming practices occurring on surrounding lands devoted to farm use. As indicated above, the sewer interceptor line will be located underground for the purpose of transporting wastewater to the City's WRF. There will be no equipment located above ground to assist with these operations. In addition, and as indicated above, the sewer line itself does not have any operating characteristics that would potentially interfere with the cultivation of pasture grass for livestock, or livestock grazing.

Based on the forgoing, the City finds that the locations of the East Interceptor and the North Interceptor satisfy OAR 660-011-0060(3).

CONFORMANCE WITH OAR 660-011:

FINDING: The 2018 CSPFP complies with all regulations in OAR Chapter 660-011.

VIII. Findings on OAR 660-0015, Compliance with Statewide Planning Goals

Goal 1: Citizen Involvement.

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

FINDING: The proposed CSPFP will meet Goal 1 because the City has used its citizen involvement program to insure citizens have an opportunity to review and comment on the PFP and the proposed changes to Chapter 8 of the Comprehensive Plan[20]. For the

[20] See Citizen Involvement Program: https://www.bendoregon.gov/home/showdocument?id=33917.

2018 CSPFP, the City will hold at least two public hearings on this proposal, consistent with the City's acknowledged procedures for legislative amendments in Section 4.6.200 of the Development Code. Those hearings provide an opportunity for citizens to be involved in the adoption of the 2018 CSPFP.

Goal 2: Land Use Planning

To establish a land use planning process and policy framework as a basis for all decisions and actions related to use of land and to assure an adequate factual base for such decisions and actions.

FINDING: The 2018 CSPFP meets this goal because it has been developed with and supported by an adequate factual base. This set of findings includes a Section V in which the City has outlined the evidence upon which the City relied to develop the 2018 CSPFP. These documents provide a factual base to show the PFP includes all necessary elements required under Division 11, specifically OAR 660-011-0010.

The 2018 CSPFP also meets this goal because the City has coordinated review of the PFP with affected governmental units. This report includes forgoing findings that address OAR 660-011-0015(2), regarding coordination with other public agencies and affected governments in plan preparation. The City contacted agency staff through electronic mail and requested comments from: 1) Bend LaPine School District; 2) Bend Parks and Recreation District; 3) Deschutes County Community Development and Road Departments; 4) ODOT Region 4, and; 5) the Arnold, Central Oregon, Swalley, and Tumalo Irrigation Districts. The City made this request before submitting the Notice of Proposed Amendment to the Oregon Department of Land Conservation and Development. After submitting the notice, the City reached out again to request comments on the draft PFP.

Goal 3: Agricultural Lands

FINDING: This goal is applicable because the proposed alignments for the East and North Interceptors include segments that travel through land designated for Agriculture on Deschutes County's Comprehensive Plan Map. These same areas are zoned for Exclusive Farm Use. The proposal satisfies this goal because the proposed use, the sewer interceptor lines identified as the North Interceptor and the East Interceptor, will not force a significant change in or significantly increase the cost of any farming practices occurring in the surrounding area.

Section VII of this report includes findings that address this more directly under OAR 660-011-0060. To summarize, the sewer interceptors will be buried underground for the purpose of transporting waste water to the City's treatment plant (aka WRF) on McGrath Road. The proposed interceptors do not have any operating characteristics that would interfere with adjacent farming practices to the extent that they would force a significant change in or significantly increase the cost of such practices. Finally, the sewer interceptors have been designed and will be constructed to rely on gravity, and will not

consume resources needed to support adjacent farming practices such as electricity and irrigation water.

Goal 4: Forest Lands

FINDING: This goal is not applicable because the 2018 CSPFP is intended to serve those land uses within the Bend UGB that are planned for under the Bend Comprehensive Plan. None of the facilities proposed in this 2018 CSPFP will be developed in or extended through forest lands.

Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces

To protect natural resources and conserve scenic and historic areas and open spaces.

FINDING: The 2018 CSPFP does not include any projects that could potentially affect Goal 5 resources already protected under the Bend Comprehensive Plan. The purpose of the 2018 CSPFP is to support the land uses allowed under the Bend Comprehensive Plan. Any development of land uses allowed under the Comprehensive Plan adjacent to identified Goal 5 resources will develop according to any adopted protection measures. The projects and improvements proposed in the 2018 CSPFP neither require nor propose any changes to any of the City's acknowledged protection measures.

Goal 6: Air, Water, and Land Resources Quality

To maintain and improve the quality of the air, water and land resources of the state.

FINDING: The 2018 CSPFP meets this goal because it includes projects that will help maintain and improve the quality of the air, water, and land resources. The PFP proposes capital projects for gravity infrastructure, lift station and force main infrastructure, and sewer collection infrastructure for the recently added UGB Expansion Areas. All of these projects will improve the collection of wastewater and its transportation to the WRF. These proposed improvements, once implemented, will ensure that the quality of the air, water, and land resources of the state are maintained.

Goal 7: Areas Subject to Natural Hazards

To protect people and property from natural hazards.

FINDING: This goal is not applicable because the 2018 CSPFP does not propose to provide sewer collection service to areas identified as Goal 7 natural hazards in the Bend UGB. None of the capital projects are proposed in areas with identified Goal 7 natural hazards.

Goal 8: Recreational Needs

FINDING: The 2018 CSPFP meets this goal because it includes projects intended to improve the existing collection system or extend it to areas that are not already served. These projects, once constructed, will ensure that sewer collection service is provided to existing and proposed parks within the Bend UGB. In addition, the City will continue to provide sewer collection service to the existing Goal 8 destination resort, Tetherow.

Goal 9: Economic Development

To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

FINDING: The 2018 CSPFP will meet this goal because the proposed improvements outlined in the PFP will improve existing collection service or provide service to areas designated for employment. These projects include local area improvements to provide wastewater collection to areas recently added to the Bend UGB for employment. In addition, the trunk sewer improvements within the UGB will serve those Opportunity Areas with capacity for additional jobs.

Goal 10: Housing

To provide for the housing needs of citizens of the state.

FINDING: The 2018 CSPFP meets this goal because it includes projects needed to serve residential areas that have been planned and zoned for needed housing. These areas within the UGB include those identified as Opportunity Areas and Expansion Areas in Chapter 11 of the Comprehensive Plan.

Goal 11: Public Facilities and Services

To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

FINDING: The 2018 CSPFP proposes a plan to develop a timely, orderly, and efficient arrangement of public sewer facilities and services to serve the land uses allowed under the Bend Comprehensive Plan. As demonstrated above, in Sections VI and VII, the PFP satisfies Goal 11 and its administrative rule at OAR 660-011.

Goal 12: Transportation

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

FINDING: This goal is not applicable because the 2018 CSPFP does not propose any changes to the city's transportation system that would trigger review under Goal 12 or its administrative rule under OAR 660-012.

Goal 13: Energy Conservation

To conserve energy.

FINDING: This goal is not applicable because the 2018 CSPFP does not propose any changes to the land uses allowed under the Bend Comprehensive Plan that would require more energy to be used. However, the PFP includes projects that include decommissioning pump stations that, once completed, can be expected to result in a more sustainable system with reduced energy demands.

Goal 14: Urbanization

To provide for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities.

FINDING: The 2018 CSPFP meets this goal because it proposes improvements to the public sewer facility systems to support the land uses in the recently expanded Bend UGB. The 2018 CSFP will support the orderly and efficient development of urban and urbanizable lands in the Bend UGB for future housing and employment. The PFP supports this orderly and efficient transition through short-term and long terms projects that will either improve or extend sewer collection service to the areas of the Bend UGB, and those land uses contemplated under the Bend Comprehensive Plan.

Goals 15 through 19

FINDING: These goals are not applicable because the City is not located within the Willamette River Greenway, and is not located within or adjacent to any coastal or estuarine resources.

CONFORMANCE WITH THE STATEWIDE PLANNING GOALS:

FINDING: The 2018 CSPFP satisfies all applicable statewide planning goals.

IX. Findings Demonstrating Compliance with Bend Comprehensive Plan

Future Plan Updates

The Comprehensive Plan is a document that changes over time to reflect new information and new directions for the future. Amendments or additions to the Comprehensive Plan text, exhibits, and policies go through a public hearing and review process before being adopted by the governing bodies. Changes and updates can be generated in at least six ways:

- ❑ *Regularly scheduled reviews and updates by the city and county. Every five years, beginning in the year 2000, the city and county will review the population growth, the housing mix and acreage needs, the industrial lands absorption, and the commercial lands absorption against the long-term forecasts in the Comprehensive Plan. Other issues may also be evaluated during these regular views.*

- ❑ *Preparation of more detailed refinement plans for neighborhoods or geographic areas. As provided for in Oregon land use law, the city or county may prepare more detailed land use and development plans for parts of the urban area that have large vacant or under-utilized parcels. Such refinement plans could address future street patterns and other utility systems, housing density and compatible uses, site and design standards, locations for parks, schools, and open space, and other land use issues.*

- ❑ *Evaluation of land use topics required to be reviewed under the Oregon Land Conservation and Development Commissions periodic review of the Comprehensive Plan. The state requires all local plans to be updated periodically to comply with applicable new state laws, administrative rules, or to incorporate new data available to the state.*

- ❑ *Other state laws or legislative actions that require changes to the Plan outside of the normal periodic review cycle. The state legislature or the voter referendum/initiative process can require changes to local land use plans within a specific time period.*

- ❑ *City or county response to new issues or changes. Issues that were unforeseen during the development of the plan can arise that have an impact on a particular neighborhood or the whole urban area. The city and county officials can direct staff to amend the Plan to address these issues.*

- ❑ *Changes proposed by individuals or other agencies. A proposal by an individual, corporation, or public agency to change to the Plan text, land use map, other exhibits, or policies shall be considered as determined by the procedures ordinance. A person or agency proposing a change has the burden to demonstrate a public need and benefit for the change.*

FINDING: The City proposes two amendments to the Bend Comprehensive Plan. One, is adoption of a 2018 public facility plan for the City's sewer collection system (CSPFP).

The second are amendments to the text of Chapter 8, Public Facilities and Services, to reflect those changes proposed by the 2018 CSPFP, and make some limited corrections.

The 2018 CSPFP and the amendments to Chapter 8 both address a public need and provide public benefits. Section V of this report refers to technical memoranda and the 2018 CSPFP which identify projects needed to both improve the existing wastewater collection system and provide service to those areas recently added to the Bend UGB. These materials identified in Section V have identified the public need for these improvements; the 2018 CSPFP satisfies this need and provides public benefits in the form of the projects themselves. The 2018 CSPFP further provides a public benefit in the form of improved wastewater collection service that comes as a result of the gravity capital projects, lift station projects, and projects that will provide sewer to those areas recently included in the UGB. In addition, the 2018 CSPFP satisfies the public need of serving the land uses contemplated and planned for under the Bend Comprehensive Plan. The public need for amending Chapter 8 of the Comprehensive Plan is to ensure the adoption of the CSPFP as an appendix to the Comprehensive Plan is consistent with previously adopted policies, including those for sewer collection. The benefit in amending Chapter 8 includes updating the text to reflect the changes to the sewer collection system adopted since the 2014 CSPFP, and ensure that this chapter reflects those changes and projects needed to provide sewer collection for the uses under the Comprehensive Plan.

The following plan policies were identified as being applicable to the review of the 2018 CSPFP and the conforming amendments to Chapter 8. These findings show the PFP and amendments to Chapter 8 are consistent with the applicable plan policies.

Chapter 1 – Plan Management and Citizen Involvement

Urban Planning Coordination

1-5. No new water or sewer service districts shall be created within the UGB without the concurrence of the city.

FINDING: The 2018 CSPFP does not propose to create new sewer collection service districts within the UGB. The PFP proposes improvements to the City's existing wastewater collection system within the UGB. It does propose the development of two new sewer interceptors – the North Interceptor and the East Interceptor – that will have segments located outside of the UGB, but serve areas within the UGB. Both the 2018 PFP and the amendments to Chapter 8 continue to recognize the City as the sewer service provider in the Bend UGB.

Development within the Urban Growth Boundary

1-6 ***New developments shall pay to extend planned sewer, water, and transportation facilities to and through the property if the development occurs prior to the scheduled construction of those facilities shown in the capital improvement plan.***

FINDING: The 2018 CSPFP meets this criterion because it includes both large capital projects and local area improvements to provide wastewater collection for the recently added UGB Expansion Areas. Development within the existing UGB and the Expansion Areas will be required to extend sewer facilities to and through property as required by this policy.

Chapter 5 – Housing

Neighborhood Appearance

5-32 Above-ground installations, such as water and sewer pumping stations, power transformer substations or natural gas pumping stations, shall be screened and designed to blend with the character of the area in which they are located.

FINDING: This policy is applicable because the 2018 CSPFP includes a number of lift station improvement projects. Development of these projects will be consistent with this policy because the lift stations will be screened and designed to blend with the character of the area in which they are located. This requirement is consistent with language in the City's Standards and Specifications (See Part II, 4.4.9).

Public Utilities and Services

5-52. All residential areas shall be provided with community water and sewer services and other facilities necessary for safe, healthful, convenient urban living consistent with the density of development.

FINDING: The 2018 CSPFP is consistent with this policy because it includes planned improvements to the wastewater collection facilities for land uses within the Bend UGB. Completion of these improvements will ensure the continued provision of sewer service throughout the City to ensure safe, healthful, and convenient urban living consistent with the density of development.

Chapter 6 – Economy

6-3. Investment in transportation, water, sewer, fiber, and other utility infrastructure should be prioritized to serve economic lands

FINDING: The 2018 CSPFP is consistent with this policy because it includes projects that will serve economic lands in the UGB. The PFP includes gravity capital projects, lift station and force main projects, and local area improvement projects that will either improve or provide wastewater collection service to the employment lands within the UGB. The projects will also provide sewer service to the recently added UGB Expansion Areas, so those areas with designated employment lands have access to sewer service.

6-4 Infrastructure will be planned, designed, and constructed to support continued economic growth and orderly development.

FINDING: The 2018 CSPFP is consistent with this plan policy because it includes wastewater collection projects that have been planned and will be designed and constructed to support continued economic growth and orderly development. As indicated in forgoing findings, the CSPFP includes a number of capital gravity projects, lift station and force main projects, and local area improvements for the UGB Expansion Areas. The PFP shows that these projects are planned to support continued economic growth by providing sewer collection service to areas designated for employment. In addition, this report includes forgoing findings addressing Statewide Planning Goals 11 and 14 that demonstrate how the improvements to the city's wastewater collection system will contribute to and support orderly development.

Chapter 8 – Public Facilities and Services

<u>Sewer Collection Facilities</u>

8-1. All new development within the City Limits should be connected to City sewer

FINDING: The 2018 CSPFP is consistent with this policy because it proposes both short-term and long term projects to provide sewer service to currently unsewered areas within the UGB enabling and encouraging development within the UGB. These projects include those serving areas recently added to the UGB in 2016.

8-2. The city is the primary provider of sewage collection and treatment services for the City's service area under Statewide Planning Goal 11.

FINDING: There are no other providers of sewer service within the City of Bend and the UGB. The City currently coordinates with all other utility providers during the planning and construction of new sewer facilities.

8-3. To reduce the reliance on individual sewage disposal systems within the Urban Growth Boundary the city will work with unsewered neighborhoods to find solutions for sewer service

FINDING: The proposed CSPFP is consistent with this policy because it includes projects intended to provide sewer for unsewered neighborhoods within Bend. These projects include the completion of North Interceptor Phase 1, and Phases 1 and 2 of the East Interceptor. In addition, the CSPFP includes a number of projects referred to as "local area improvements" that will provide sewer service to the Expansion Areas recently added to the Bend UGB.

8-4 The city should collect a sufficient amount of revenue to allow the creation of capital project reserves and to replace aging infrastructure in addition to operational needs of the utility.

FINDING: The 2018 CSPFP includes discussion of sewer rates and system development charges (SDCs) that show sufficient revenues will be collected to fund capital project reserves. This funding source will allow the City to replace aging sewer infrastructure in addition to any operational needs of the City's sewer utility. The PFP includes discussion of monthly sewer rates and SDC's (See pages 78 to 82) and how these revenues fund the operation of the sewer utility and fund current and future capital projects.

8-5 Staff should report to Council on an annual basis regarding the status of the Collection System Master Plan, Capital Improvement Projects and capacity issues within the collection system.

FINDING: This policy is not an approval criterion for the 2018 CSPFP. However, the City will be taking actions to comply with it when the Planning Commission recommendation on the 2018 CSPFP is brought to the City Council for consideration.

8-6 The City will annually update its financial model as part of the review of sewer rates and report to Council on any changes in the 20-year financial outlook and subsequent rate impacts.

FINDING: This policy is not applicable to the 2018 CSPFP. This policy requires the City to take an action outside of the PFP development process, but the information regarding the financial model and sewer rates has been incorporated in the draft PFP.

8-7 The master plan shall be updated at least every 5 years with official review and adoption by Council.

FINDING: This policy refers to the Collection System Master Plan (CSMP), the last version of which was adopted by Council in December 2014. The 2017-2019 Strategic Plan identifies the update of the CSMP starting in 2019[21].

[21] See 2017-2019 Strategic Plan online - https://www.bendoregon.gov/home/showdocument?id=31653.

8-8 The preference of the City is to serve development through gravity conveyance and use of the Water Reclamation Facility.

FINDING: The 2018 CSPFP is consistent with this policy because it continues this preference of relying on gravity conveyance of wastewater to the Water Reclamation Facility. The PFP includes gravity capital projects including several local gravity improvements that will continue to rely on gravity conveyance.

8-9 If lift stations are required to serve new development, regional pump stations shall be relied upon to the extent practicable versus individual or smaller lift stations.

FINDING: The 2018 CSPFP includes seven (7) lift station projects that will serve as regional facilities in the UGB. Three of these projects have an associated force main project. The PFP is consistent with this policy.

8-10 These policies will be implemented through the City of Bend Public Improvement Construction Procedure Standards & Specifications.

FINDING: This policy is not applicable to review of the 2018 CSPFP. The Standards and Specifications were last updated as of March 1, 2018[22].

8-11 The City should look for reasonable opportunities to decommission energy- and maintenance-intensive lift stations as part of new development or other City infrastructure projects.

FINDING: The 2018 CSMP is consistent with this plan policy because it includes several capital projects intended to decommission lift stations (See Table 23). These projects are described at pages 50 and 51 of the 2018 CSPFP:

- Southeast Lift Station Decommissioning. With completion of the Southeast Interceptor, gravity sewer connections can be implemented to decommission up to 24 lift stations.

- North Interceptor Phase 2 and North Area Lift Station Decommissioning. Once the sewer interceptor is in place, gravity sewer connections can be implemented to decommission up to 7 lift stations.

- North Interceptor Phase 3. Once this interceptor is in place, gravity sewer connections can be implemented to decommission two additional lift stations.

[22] See City's website for Standards and Specifications - https://www.bendoregon.gov/government/departments/community-development/private-development-engineering-services/standards-specs.

8-12 The City will consider the conservation and water reuse measures in the Water Management and Conservation Plan in infrastructure planning to reduce overall impacts to the sewer collection and treatment system.

FINDING: This plan policy is not an approval criterion for the 2018 CSPFP. This policy will apply to review of the next Water Management and Conservation Plan.

8-13 The City may establish wastewater collection facilities such as sewer interceptor lines, outside of the Bend UGB, to better serve the land inside the UGB.

FINDING: The proposed CSPFP meets this plan policy because the PFP itself, the supporting evidence in Section V, and forgoing findings show the necessity of locating two sewer interceptors outside of the Bend UGB to better serve lands inside the UGB. These materials support locating the North Interceptor and the East Interceptor outside of the UGB to better serve the lands each interceptor will serve. The North Interceptor will provide sewer collection services to the North Triangle and OB Riley Expansion Areas, and will provide capacity for some infill in the northeast. The East Interceptor will provide sewer collection service for the Northeast Edge and the DSL property, and also provide additional sewer capacity for the Southeast.

8-14 The City may allow lands outside the UGB to connect to sewer collection facilities located outside of the UGB in order to mitigate a public health hazard,

FINDING: The proposed CSPFP will meet this plan policy because the City has already adopted a land use regulation that implements this policy. This report includes a forgoing finding that in January of 2018, the Bend City Council adopted Ordinance 2302. Through this ordinance, the Council amended BDC 3.4.400 to add a new section (E) to state that service connections to sewer collection facilities established outside of the Bend UGB may only be allowed in cases where a health hazard exists.

Chapter 11 – Growth Management

<u>General Area Planning Policies</u>

11-21 Area Plans are intended to coordinate development and provide flexibility to tailor land use regulations and/or transportation and infrastructure plans to respond to area- or site-specific conditions.

FINDING: The 2018 CSMP is consistent with this policy because it includes local area improvement projects to serve UGB Expansion Areas. These projects include several local area improvement projects (<u>See</u> page 53), which include two projects for the Elbow Expansion Area. The gravity capital projects list includes Phases 1 and 2 of the East Interceptor, and Phases 2 and 3 of the North Interceptor, which are needed to

provide sewer service to the Northeast Edge and North Triangle Expansion Areas. The Elbow, Northeast Edge, and North Triangle are all areas that require an area plan according to plan policies in Chapter 11, Growth Management, of the Comprehensive Plan.

Master Planning Policies

11-31 The purposes of master plans are to:

- ***promote and facilitate coordinated development and efficient use of land;***
- ***provide a process to consider future development on larger sites and to analyze future demand on public facilities; and***
- ***provide an opportunity for innovative and creative development while providing long-term predictability for the applicants, surrounding neighborhoods, and the entire community***

FINDING: This finding addresses the second bullet under Policy 11-31. The 2018 CSPFP is consistent with this policy because it includes significant capital projects that will help inform any analysis on future demand for public sewer facilities. Development proposed in area plans and master plans will be evaluated by the City to determine their impact on the capacity of sewer collection facilities.

Annexation Policies

11-43 Requests for annexation must demonstrate how the annexed land is capable of being served by urban services for sanitary sewer collection, domestic water, transportation, schools and parks, consistent with applicable district facility plans and the City's adopted public facility plans.

FINDING: The 2018 CSMP is consistent with this policy because it aids both annexation requestors and the City to develop and review annexation requests. Such requests and their evaluation will consider the capability of being served by sanitary sewer collection facilities[23]. The 2018 CSPFP includes both significant capital projects and local area improvements that will provide sanitary sewer collection for the expansion areas where an area plan is required (See text page 53; Table 23).

CONFORMANCE WITH THE BEND GENERAL PLAN:

FINDING: The 2018 CSPFP is consistent with all applicable provision of Bend's Comprehensive Plan.

[23] See BDC 4.9.600(A)(3) and (A)(4).

X. Findings on Compliance with Bend Development Code 4.6.200, Legislative Amendments

4.6.200 – Legislative Amendments

A. Applicability, Procedure and Authority. Legislative amendments generally involve broad public policy decisions that apply to other than an individual property owner. These include, without limitation, amendments to the text of the Comprehensive Plan and map, Development Code and changes in the zoning map not directed at a small number of properties. They are reviewed using the Type IV procedure in accordance with Chapter 4.1, Land Use Review and Procedures and shall conform to BDC 4.6.600, Transportation Planning Rule Compliance. A legislative amendment may be approved or denied.

FINDING: This criterion is applicable because the City proposes a legislative amendment to the text of the Bend Comprehensive Plan and has followed the applicable procedures. This proposed amendment includes adopting the 2018 CSPFP as an appendix to the Comprehensive Plan, and amendments to the text of Chapter 8, *Public Facilities and Services*.

B. Criteria for Legislative Amendments. The applicant shall submit a written narrative which explains how the approval criteria will be met. A recommendation or a decision to approve or to deny an application for a legislative amendment shall be based on all of the following criteria:

1. The request is consistent with the applicable State land use law;

FINDING: The findings under Sections VI, VII, and VIII above show the 2018 CSPFP is consistent with Statewide Planning Goal 11, its administrative rule at OAR 660 Division 11, and the applicable statewide planning goals.

2. The request is consistent with the applicable Bend Comprehensive Plan goals and policies;

FINDING: The 2018 CSPFP meets this criterion because the findings in Section IX show the PFP is consistent with the Bend Comprehensive Plan.

3. The applicant can demonstrate a public need or benefit for the proposed amendment.

FINDING: The 2018 CFPFP meets this criterion because the City has demonstrated the PFP fulfills a public need and provides a public benefit. The public need satisfied by the adoption of the 2018 PFP is the need to have pubic sewer collection facilities that can serve the land uses contemplated and allowed under the Bend Comprehensive Plan. These uses include those that will be developed in the Opportunity Areas, and in the UGB Expansion Areas. The current PFP for sewer collection was completed in

2014, and does not include projects needed to serve both the entire UGB, and local area improvements needed to serve the UGB Expansion Areas. The public benefit for the change includes the proposed improvements to the sewer collection system that will support the development of land uses allowed under the Comprehensive Plan.

CONFORMANCE WITH THE BEND DEVELOPMENT CODE SECTION 4.6.200:

FINDING: The 2018 CSPFP is consistent with Bend Development Code Section 4.6.200.

CONCLUSIONARY FINDINGS: Based on the findings above, the proposed 2018 Collection System Public Facilities Plan is consistent with and implements Goal 11, OAR 660-011 Public Facilities and Planning, all applicable statewide planning goals, all applicable policies of Bend's Comprehensive Plan and is consistent with Bend Development Code Section 4.6.200.

Figure 1: North and East Interceptors and County Plan Designations