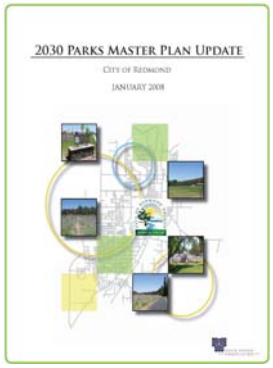
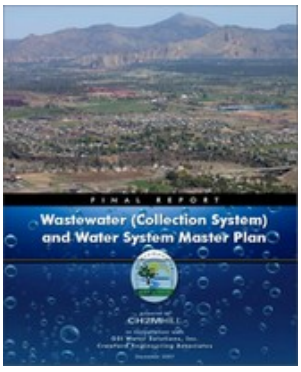
PUBLIC REVIEW DRAFT
MARCH 11, 2008

CITY OF REDMOND
PUBLIC FACILITIES PLAN

BUILDOUT 2030





CITY OF REDMOND OREGON
SINCE 1910

TRANSPORTATION WATER WASTEWATER PARKS

Prepared by the City of Redmond

SECTION 1: INTRODUCTION

Background

In November 2006, the Department of Land Conservation and Development approved the City of Redmond's Urban Growth Boundary (UGB) plan amendments which added 2,299 acres to the City's existing Urban Growth Boundary.

With the addition of 2,299 acres of urbanized land, the City has satisfied Oregon statewide land use requirements of a 20-year land supply in support of the Deschutes County coordinated population forecast of 45,724 residents in Redmond in 2025.

The Public Facility Plan

Oregon statewide land use planning laws (Goal 11) require municipalities to prepare Public Facilities Plans to plan and identify necessary infrastructure to serve development within the UGB. The Public Facilities Plan is required to be adopted as a supporting document to a municipality's comprehensive plan.

This Public Facilities Plan (PFP) identifies the major public infrastructure needed during the next 20+ years to support the City of Redmond's Comprehensive Plan. The PFP serves as a foundation for a continuous planning process relating to the City's infrastructure delivery and is the basis for calculating System Development Charges (SDCs) and other funding sources.

The primary component of a PFP is the listing of significant or major facilities of each infrastructure system along with improvements planned within specific time frames. This PFP contains Capital Improvement Plans (CIP) for the City of Redmond's infrastructure systems consisting of Transportation, Water, Wastewater, and Parks. The individual CIPs have been prepared via comprehensive infrastructure master plan updates in reaction to the UGB expansion.

Master Plan Development

With adoption of the PFP, the Redmond City Council will also be adopting the associated infrastructure master plans. The following Master Plans will be adopted by reference with approval of the PFP:

- Water System Master Plan, prepared by CH2MHill, December, 2007
- Wastewater (Collections System) Master Plan, prepared by CH2MHill, December, 2007
- Water Pollution Control Facility Master Plan Update, prepared by Brown and Caldwell, March 2008
- 2030 Parks Master Plan Update, prepared by David Evans and Associates, January 2008

The City's Transportation System Plan (TSP) update (prepared by DKS Associates) will be adopted under a separate set of legal requirements based on Statewide Planning Goal 12 and associated implementing administrative rules.

The individual master plans are available on the City of Redmond website, via the following links:

Transportation: http://www.ci.redmond.or.us/internet/content/view/503/264/

Water/Wastewater Collections: http://www.ci.redmond.or.us/internet/content/view/493/223/

Parks: http://www.ci.redmond.or.us/internet/content/view/502/264/

PFP Breakdown

The Executive Summary of each supporting Master Plan has been included in the each supporting section of the PFP. The individual sections of the PFP are as follows:

Section 1:	Introduction
Section 2:	Decision Process
Section 3:	Forecast Need
Section 4:	Overview of Oregon SDC Law and Redmond's Existing SDC
Section 5:	Transportation CIP and SDC (including Executive Summary of the TSP)
Section 6:	Water CIP and SDC (including Executive Summary of the Water Master Plan)
Section 7:	Wastewater CIP and SDC (including Executive Summary of the Wastewater Collections Master Plan and Chapter 5 of the WPCF Facility Plan)
Section 8:	Parks CIP and SDC (including Executive Summary of the Parks Master Plan)
Section 9:	Summary

In addition to inclusion of the corresponding Executive Summary, Sections 5 through 8 each contain associated SDC analysis Technical Memoranda as well as the associated Capital Improvement Plan (project list or "309 list") and Maps.

Section 9 provides the summary of results of each System Development Charge calculation and associated recommendation(s) for Council consideration.

SECTION 2: DECISION PROCESS

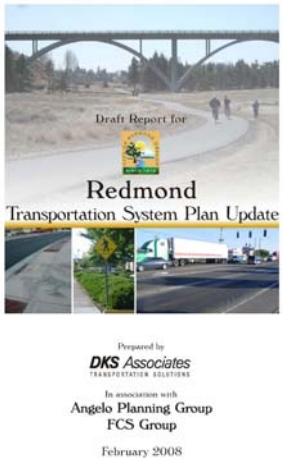
Background

With expansion of the UGB, there became an immediate need to update all existing infrastructure master plans to determine necessary new public infrastructure facilities within the new 2,299 acre expansion areas. Given the variety in expertise required within each infrastructure element, three separate consultant teams were hired to prepare master plans, capital improvement plans, and SDC analysis for Transportation, Water, Wastewater, and Parks. Stakeholder committees were assembled to assist with decision making and process through preparation of the Transportation System Plan and Parks Master Plan.

The decision processes and committees utilized for each infrastructure element are described separately below:

Transportation

In partnership with the Oregon Department of Transportation (through an ODOT TGM grant and associated Work Order Contract), the City consulted with DKS Associates to prepare the Transportation System Plan. Two stakeholder committees (Project Advisory Committee or PAC, and Technical Advisory Committee, or TAC) were convened in preparation of the TSP given the complexity of the issues and the regional impact.



Project Team and Stakeholder participation is as follows:

Project Manager:	Chris Doty, PE, PTOE, City of Redmond Jim Bryant, ODOT (ODOT Project Manager for TSP)
Consultant Team Leads:	Carl Springer, PE, PTOE, DKS Associates DJ Heffernan, Angelo Planning Group John Ghilarducci, FCS Group
Technical Advisory Committee:	Mike Caccavano, City of Redmond Engineering Nick Lelack, City of Redmond Planning Thanh Nguyen, ODOT Transportation Planning Analysis Unit Peter Russell, Deschutes County Mark Radabaugh, DLCD Region 4 Carrie Novick, City of Redmond Airport Tim Moor, City of Redmond Fire and Rescue Ronnie Roberts, City of Redmond Police Joel McCarroll, ODOT Region 4 David Boyd, ODOT Region 4 Rod Cathcart, ODOT Region 4 Tom Blust, Deschutes County

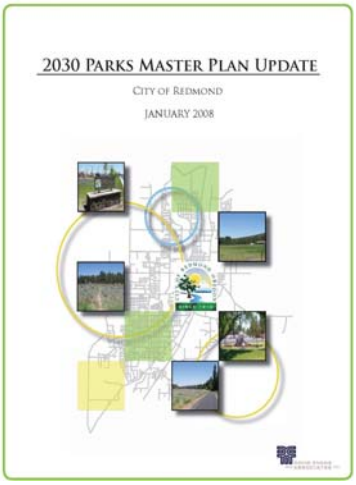
Patrick Creedican, ODOT District 10
David Lanning, ODOT Rail
Cary Goodman, ODOT Freight
Peter Schuytema, ODOT Transportation Planning Analysis Unit
David Pilling, City of Redmond, Engineering

Project Advisory Committee: Jim Hendryx, City of Redmond Community Development Department
Bud Prince, Redmond Economic Development
Alan Unger, Mayor
Joe Mansfield, Redmond City Council
Stan Clark, Redmond Planning Commission
Andy High, Central Oregon Builders Association

In preparation of the TSP, five TAC and PAC meetings were held, in addition to three Open House meetings during the course of the Project. The Redmond City Council and Urban Area Planning Commission have held two joint workshops to review project milestones during the course of the TSP preparation.

Parks

The firm of David Evans and Associates was consulted to prepare the Parks Master Plan Update. Similar to the TSP process, a Project Advisory Committee was formed to provide guidance and approval of the work product.



Project Team and Stakeholder participation is as follows:

Project Manager: Jeff Powers, City of Redmond Public Works, Parks Division
Chris Doty, PE, City of Redmond Public Works

Consultant Team Leads: David Olsen, David Evans & Associates
Crystal Hutchens, David Evans & Associates
Ray Bartlett, Economic & Financial Analysis

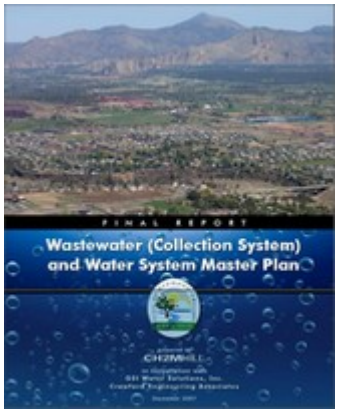
Project Advisory Committee: George Endicott, Redmond City Council
Shirlee Evans, Redmond Planning Commission
Katie Hammer, Redmond Area Parks and Recreation District
Jim Hendryx, City of Redmond Community Development Department
Steve Herbert, Central Oregon Builders Association
Steve Johnson, Central Oregon Irrigation District
Gary Parks, Parks Commission
Doug Snyder, Redmond School District, 2J

The PAC met six times over the course of the Project to review milestones and work product. To obtain further public input, two public open house meetings were held and a questionnaire was issued in City utility bills and posted on the City website. A total of 447 households, representing 1,095 Redmond citizens responded to the questionnaire.

In addition to the PAC, the Master Plan was reviewed and approved by the Redmond Parks Commission.

Water and Wastewater

The City hired the engineering firm of CH2MHill to assemble the Water and Wastewater (Collections) Master Plans for the new UGB areas and contracted with Water Pollution Control Facility (Wastewater Treatment Plant) design firm Brown and Caldwell to amend the existing WPCF Master Plan to plan for additional improvements necessary at the WPCF to accommodate additional wastewater flow.



As opposed to the Transportation and Parks master plan processes, a Project Advisory Committee was not assembled or convened. The Water and Wastewater (Collections) master plan was formally presented to the Redmond Urban Area Planning Commission and Redmond City Council in separate meeting work sessions of each group upon completion of the Final Draft. Informal meetings with interested development groups in the new UGB area were also held during the course of the Project.

The Project Team consisted of the following staff members and consultant groups:

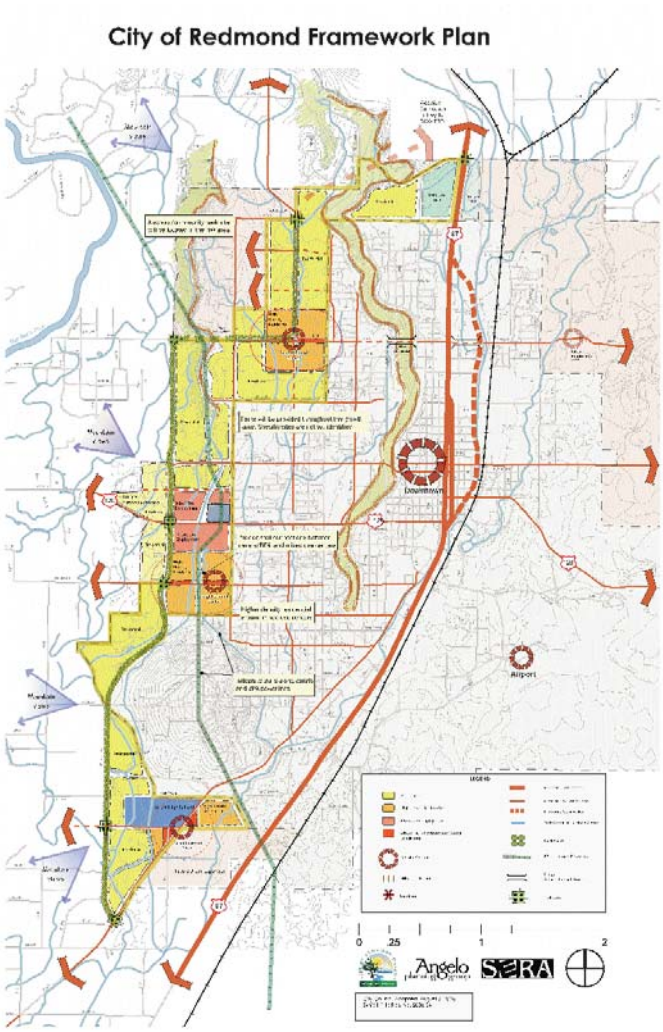
Project Managers:	Mike Caccavano, PE, City of Redmond Engineering (Water/Wastewater Collections) Shannon Taylor, City of Redmond Public Works, Wastewater Division (WPCF Master Plan Update)
Consultant Team Leads:	Paul Berg, PE, CH2MHill, Water Master Plan Lead Brady Fuller, PE, CH2MHill, Wastewater (Collections) Master Plan Lead David Crawford, PE, Crawford Engineering and Associates, Wastewater Modeling Lead Mark Anderson, PE, Wastewater (Collections) Plan Engineer David Stangel, PE, Water Modeling Lead David Livesay, RG, GSI Water Solutions Inc, Hydrogeologist David Newton, PE, Newton and Associates (Water Mitigation) Deborah Galardi, Galardi Consulting LLC (SDC Analysis) Daria Wightman, PE, Brown and Caldwell (WPCF Master Plan Update)

SECTION 3: FORECAST NEED

Background

The City of Redmond obtained approval of a 2,299 acre UGB expansion in December 2006 from the State of Oregon's Department of Land Conservation and Development. The purpose of the UGB expansion was to provide a 20-year supply of development area as mandated by Statewide Land Use Goal 14.

The approved UGB expansion was based on land needs identified in 2005 with a 20-year target population forecast of 45,724 in 2025. The 2025 population projection is based on a coordinated agreement between the State, Deschutes County, and the cities of Bend, Redmond, and Sisters to distribute the Oregon Office of Economic Analysis (OEA) population forecast for the county.



An additional component of the City's application to the State for expansion of the UGB included a framework plan (see inset) which identified anticipated land use in the new UGB urbanized areas.

Refinement

The PFP and associated infrastructure master plans have been crafted to provide the infrastructure necessary at buildout of the UGB. It is essential to assume buildout of all zoned property within the UGB to provide adequate minimum levels of service of the transportation, water, wastewater and parks systems upon full land use development of anticipated urban zoning. By assuming full buildout of urban zones in the UGB, the PFP and associated master plans are less time sensitive, and instead more development centric. Infrastructure needs are more directly correlated with land use (and buildout thereof) than arbitrary time periods.

With construction of the traffic model associated with the Transportation System Plan, a detailed land use analysis was performed via development of sub-basin Transportation Analysis Zones or TAZs.

Land use assumptions in the approved Framework Plan were applied to over 220 individual TAZs in the Redmond area. The following development densities (in the existing undeveloped UGB and new UGB areas) were then applied to the TAZs to produce buildout estimates of residential units and employment data:

Existing UGB Undeveloped Areas:

Zone	Density	Units per Acre (Gross)
R1-R2	3.5	Dwelling Units
R3-R4	5.6	Dwelling Units
R5	7.5	Dwelling Units
C1-C5	18	Employees
M1	9	Employees
M2	5	Employees

Proposed New UGB Areas:

Zone	Density	Units per Acre (Gross)
Residential	5.9	Dwelling Units
Employment (non-retail)	12.5	Employees
Retail	18	Employees
M1 (Light Industrial)	9	Employees
M2 (Heavy Industrial)	5	Employees
Office/Other	21	Employees

As a result of the detailed land use analysis associated with creation of the traffic model associated with the TSP, it was determined that buildout of the UGB would accommodate a population of close to 60,000 residents.[1, 2]

The estimated buildout population of 59,099 exceeds the coordinated population forecast for 2025. In order to address this anomaly, the horizon year (estimated buildout date of UGB) of the PFP and associated infrastructure master plans was assumed as 2030 as opposed to 2025.

The PFP and associated master plans therefore make the assumption that the coordinated population forecast will be reached at the end of Phase III (2021-2025) as opposed to the horizon year of the PFP (2030).

Forecast Data

Detailed forecast data specific to each infrastructure element is available in the supporting Transportation (TSP), Water, Wastewater, or Parks Master Plan documents.

[1] An original estimate of 58,000 was determined during initial development stages of the traffic model. This estimate was subsequently further refined to 59,099 upon final approval of the traffic model assumptions.

[2] A geospatial analysis performed in calibration of the wastewater model associated with the Wastewater (Collections) Master Plan confirmed a buildout population estimate in the vicinity of 60,000 residents.

SECTION 4: OVERVIEW OF OREGON SDC LAW[3] AND REDMOND'S EXISITNG SDC

Background

Oregon legislation establishes guidelines for the calculation of system development charges (SDCs). Within these guidelines, local governments have some latitude in selecting technical approaches and establishing policies related to the development and administration of SDCs. A discussion of this legislation follows.

SDC Legislation in Oregon

In the 1989 Oregon state legislative session, a bill was passed that created a uniform framework for the imposition of SDCs statewide. This legislation (Oregon Revised Statute [ORS] 223.297-223.314), which became effective on July 1, 1991, (with subsequent amendments), authorizes local governments to assess SDCs for the following types of capital improvements:

- Storm water and flood control
- Water supply, treatment, and distribution
- Wastewater collection, transmission, treatment, and disposal
- Transportation
- Parks and recreation

The legislation provides guidelines on the calculation and modification of SDCs, accounting requirements to track SDC revenues, and the adoption of administrative review procedures.

SDC Structure

SDCs can be developed around two concepts: (1) a reimbursement fee, and (2) an improvement fee, or a combination of the two. The **reimbursement fee** is based on the costs of capital improvements *already constructed or under construction*. The legislation requires the reimbursement fee to be established or modified by an ordinance or resolution setting forth the methodology used to calculate the charge. This methodology must consider the cost of existing facilities, prior contributions by existing users, gifts or grants from federal or state government or private persons, the value of unused capacity available for future system users, rate-making principles employed to finance the capital improvements, and other relevant factors. The objective of the methodology must be that future system users contribute no more than an equitable share of the capital costs of *existing* facilities. Reimbursement fee revenues are restricted only to capital expenditures for the specific system which they are assessed, including debt service.

The methodology for establishing or modifying an **improvement fee** must be specified in an ordinance or resolution that demonstrates consideration of the *projected costs of capital improvements identified in an adopted plan and list*, that are needed to increase capacity in the system to meet the demands of new development. Revenues generated through improvement fees are dedicated to capacity-increasing

[3] SDC Overview courtesy of Deborah Galardi, Galardi Consulting LLC.

capital improvements or the repayment of debt on such improvements. An increase in capacity is established if an improvement increases the level of service provided by existing facilities or provides new facilities.

In many systems, growth needs will be met through a combination of existing available capacity and future capacity-enhancing improvements. Therefore, the law provides for a **combined fee** (reimbursement plus improvement component). However, when such a fee is developed, the methodology must demonstrate that the charge is not based on providing the same system capacity.

Credits

The legislation requires that a credit be provided against the improvement fee for the construction of "qualified public improvements." Qualified public improvements are improvements that are required as a condition of development approval, identified in the system's capital improvement program, and either (1) not located on or contiguous to the property being developed, or (2) located in whole or in part, on or contiguous to, property that is the subject of development approval and required to be built larger or with greater capacity than is necessary for the particular development project to which the improvement fee is related.

Update and Review

The methodology for establishing or modifying improvement or reimbursement fees shall be available for public inspection. The local government must maintain a list of persons who have made a written request for notification prior to the adoption or amendment of such fees. The legislation includes provisions regarding notification of hearings and filing for reviews. Recent amendments clarified that "periodic application of an adopted specific cost index or… modification to any of the factors related to rate that are incorporated in the established methodology" are not considered "modifications" to the SDC. As such, the local government is not required to adhere to the notification provisions. As a result of 2003 amendments, the criteria for making adjustments to the SDC rate, which do not constitute a change in the methodology, have been further refined as follows:

- "Factors related to the rate" are limited to changes to costs in materials, labor, or real property as applied to projects in the required project list.
- The cost index must consider average change in costs in materials, labor, or real property and must be an index published for purposes other than SDC rate setting.

The notification requirements for changes to the fees that *do* represent a modification to the methodology are 90-day written notice prior to first public hearing, with the SDC methodology available for review 60 days prior to public hearing.

Other Provisions

Other provisions of the legislation require:

- Preparation of a capital improvement program or comparable plan (prior to the establishment of a SDC), that includes a list of the improvements that the jurisdiction intends to fund with improvement fee revenues and the estimated timing, cost, and eligible portion of each improvement.

- Deposit of SDC revenues into dedicated accounts and annual accounting of revenues and expenditures, including a list of the amount spent on each project funded, in whole or in part, by SDC revenues.
- Creation of an administrative appeals procedure, in accordance with the legislation, whereby a citizen or other interested party may challenge an expenditure of SDC revenues.

The provisions of the legislation are invalidated if they are construed to impair the local government's bond obligations or the ability of the local government to issue new bonds or other financing.

Redmond's Existing SDCs

The City of Redmond finalized a major PFP update in 2001 and subsequently performed minor updates in 2002 and 2005. The existing City of Redmond SDCs were last updated in 2005 and are reflected in the tables below:

TRANSPORTATION

The Transportation SDC is a function of the PM peak hour trip generation of the proposed development, as calculated per the Institute of Transportation Engineers manual, Trip Generation, 6th Ed. or by an approved Trip Generation study performed by a registered professional engineer. Pass-by trips are excluded.	Total
	$2,877 per PM peak hour trip (Improvement Fee Only)

WATER

Water Meter Size	Hyd. Ratio	*Reimbursement Amount*	*Improvement Amount*	Total
5/8"	1.0	$168	$1,924	$2,092
3/4"	1.5	$252	$2,886	$3,138
1"	2.5	$420	$4,810	$5,230
1.5"	5	$840	$9,620	$10,460
2"	8	$1,344	$15,392	$16,736
3"	16	$2,688	$30,784	$33,472
4"	25	$4,200	$48,100	$52,300
6"	50	$8,400	$96,200	$104,600

WASTEWATER

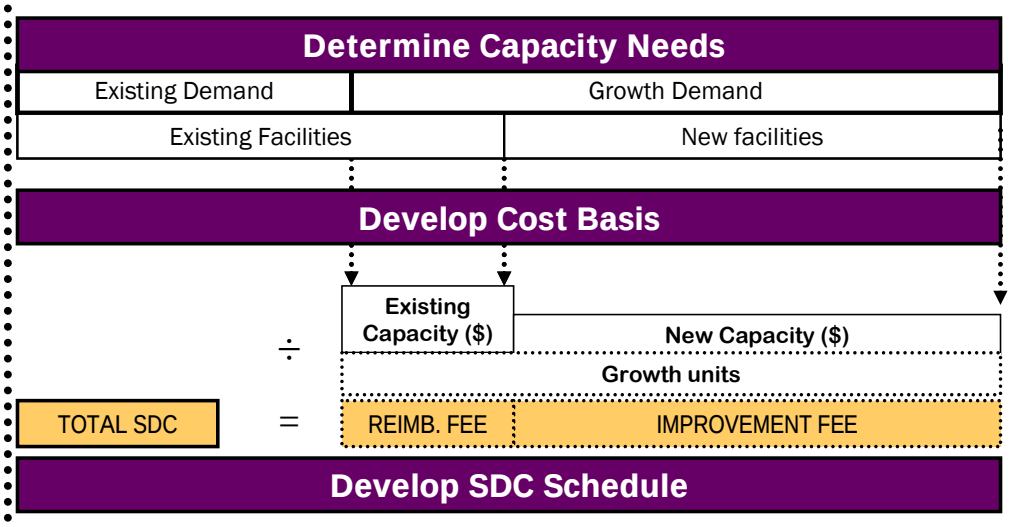
Water Meter Size	Hyd. Ratio	*Reimbursement Amount*	*Improvement Amount*	Total
5/8"	1.0	$945	$1,160	$2,105
3/4"	1.5	$1,418	$1,740	$3,158
1"	2.5	$2,363	$2,900	$5,263
1.5"	5	$4,725	$5,800	$10,525
2"	8	$7,560	$9,280	$16,840
3"	16	$15,120	$18,560	$33,680
4"	25	$23,625	$29,000	$52,625
6"	50	$47,250	$58,000	$105,250

PARKS

Parks SDCs are charged to residential development only. The SDC is the same regardless of type of dwelling unit. (i.e. single family, apartment, mobile home, etc.)	Total
	$834 per dwelling unit (Improvement Fee Only)

Existing Methodology Overview

The City's existing SDC methodology is generally described in the figure below[4]:



The existing Improvement Fee portion of the SDC is generally calculated as follows:

Improvement SDC = SDC eligible funding (per CIP) / Growth Unit

Where Growth Units are:

Transportation:	PM Peak Hour Trip
Water:	Equivalent Dwelling Unit, EDU
Wastewater:	Equivalent Dwelling Unit, EDU
Parks:	Dwelling Unit, DU

The City's currently charges a Reimbursement Fee for water and wastewater. As originally calculated in 2001, the Reimbursement Fee allocation is based on recovery of the estimated cost of existing capacity in the water and wastewater system utilized by future growth.

The current Transportation and Park SDCs are exclusively Improvement Fee based and do not include a Reimbursement Fee portion.

Proposed Methodologies

The proposed new SDC methodologies are similar to the existing SDC methodologies for Transportation, Water, Wastewater, and Parks. The proposed new methodologies are separately and individually described in Section 5 (Transportation), Section 6 (Water), Section 7 (Wastewater), and Section 8 (Parks).

A summary of the proposed new SDC fee structure is contained Section 9 (Summary Recommendation).

[4] Figure courtesy of Galardi Consulting LLC

SECTION 5: TRANSPORTATION

The elements of the Transportation Section include as follows:

1. Executive Summary from the City of Redmond Transportation System Plan (Public Review Draft, February 2008)

2. Capital Improvement Plan (March 07, 2008 Draft)

3. SDC Technical Memoranda
    a. Technical Memorandum #1: Key Transportation SDC Policy Issues
    b. Technical Memorandum #2: SDC Analysis
    c. Technical Memorandum #3: Findings and Recommendation

SECTION 5-1: TSP EXECUTIVE SUMMARY

TSP Executive Summary

Introduction

In June 1999, the City of Redmond adopted their first Transportation System Plan (TSP). Since that time, there have been significant growth and planned growth in Redmond and its surrounding communities, and a few key changes to state highway facility plans in the area. The primary purpose of this update is to address these changes, with focus on:

- Addressing how the new Re-Route of US 97 north of Highland Avenue will affect city street circulation and related access to growing industrial areas to the east.
- Confirm that the plan is consist with latest Statewide Plans and Policies.
- Ensuring that system plans can adequately serve Redmond growth to nearly 60,000 people inside the City's urban planning area and additional development outside the City's limits that influence local conditions (e.g., rural lands and destination resorts).

This plan update is aimed at fulfilling Transportation Planning Rule (TPR) requirements for comprehensive transportation planning in the cities of Oregon, and presents the investments and priorities for the Pedestrian, Bicycle, Transit, and Motor Vehicle systems along with new transportation programs to correct existing shortfalls and enhance critical services.

For each travel mode, a **Master Plan** project map and list are identified to support the City's transportation goals and policies. Projects that can be funded over the next 20 years are referred to as **Action Plans**.

The TSP provides specific information regarding transportation needs to guide future transportation investment in the City and determine how land use and transportation decisions can be brought together beneficially for the City and is based on needs required to meet transportation demand based on 2030 future needs. This executive summary provides the goals and policies, modal plans and financing summaries. For a more detailed analysis, refer to the remaining chapters for more in-depth information.

Plan Process and Committees

The Redmond TSP update was developed in close coordination with Redmond city staff and key representatives from the surrounding communities. Two formal committees participated in the plan development:

- Technical Advisory Committee (TAC) – Agency staff from Oregon Department of Transportation, Deschutes County, and the City of Redmond participated in reviewing the technical methods and

findings of the study. The focus of this group was on consistency with the plans and past decisions in adjoining jurisdictions, and consensus on new recommendations.

- Project Advisory Committee (PAC) – The Redmond Public Advisory Committee served as the representatives for citizens and community members. A series of meetings were held with the PAC to report interim study findings and any outstanding policy issues that required their direction. The meetings were open to participation by the general public.

The committees met regularly through the plan development process to review interim work products, assist in developing and ranking transportation solutions, and to refine master plan elements to ensure consistency with community goals. Additionally, a public open house was held, allowing citizens to comment on the plan, make suggestions and provide feedback.

The Redmond Transportation System Plan process included the following steps:

- Update Goals and Policies
- Inventory/Data Collection to a year 2007 baseline
- Evaluate Existing Conditions and Future Travel Needs Through Forecasting
- Update Needs by Travel Mode and Consider Alternatives
- Refine Improvement Lists to Mitigate Deficiencies by Mode For 2030 Conditions
- Update Planning and Cost Estimates of Improvements
- Identify Financing Sources
- Draft TSP

As with the 1999 TSP, this TSP's planning objective was to optimize each of these modes of transportation within Redmond with the 2030 forecasted travel demand. The following sections summarize the findings of the Transportation System Plan studies.

Public Involvement

Two public open house events were held to present findings, and to gather feedback from the community. The first meeting was held on June 28, 2007 to discuss the overall project process, and to present how safe and effective the system operates today. The second meeting was held on November 8, 2007 to talk about how growth to 2030 will change current transportation needs, and discuss alternative ways that growth can be served.

A final Public Open House is scheduled for 28 February 2008, which will review the findings and conclusions of the Transportation System Plan update.

Goals and Policies

The City's Comprehensive Plan lays out a general policy framework regarding transportation services. The goals and policies[1] of this TSP are not prioritized and are presented in Chapter

[1] Goals are defined as brief guiding statements that describe a desired result. Policies associated with each of the individual goals describe the actions needed to move the community in the direction of completing each goal.

2. These goals and policies were applied in the development of this Transportation System Plan to formulate strategies and implementing measures for each of the travel modes applied in the City of Redmond. The intent of the updated policies was to simplify and/or clarify statements from the 1999 TSP and to respond to more recent policies that were adopted by the State of Oregon and ODOT.

The transportation policies are summarized below. Further information is provided in Chapter 2.

- **Goal 1**. Provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes serving all residential areas and businesses..
- **Goal 2**. Develop a transportation system that is supportive with the City's adopted comprehensive land use plan and with the adopted plans of state, local, and regional jurisdictions.
- **Goal 3**. Establish a clear and objective set of transportation facility design and development regulations and standards that address all elements of the city transportation system and promote access to and utilization of a multi-modal transportation system.
- **Goal 4.** Develop complementary infrastructure for bicycles and pedestrian facilities to provide a diverse range of transportation choices for city residents.
- **Goal 5**. Provide reliable convenient transit service to Redmond residents and businesses as well as special transit options for the city's elderly and disabled residents.
- **Goal 6**. Ensure that efficient and effective freight transportation infrastructure is developed and maintained to support local and regional economic expansion and diversification consistent with City economic plans and policies..
- **Goal 7**. The Redmond transportation network will be managed in a manner that ensures the plan is implemented in a timely fashion and is kept up to date with respect to local and regional priorities.

New policies incorporate recent initiatives within the city and county as it relates to transportation facilities. The specific areas of the changes address the following key issues, some of which the City has already implemented:

- Street connectivity — The existing local street spacing standards were refined to include walkways, and were applied citywide on a conceptual level to make a Local Street Connectivity Map, which is presented in Chapter 9. This map and the supporting standards and development code will guide future connections to larger vacant lands that work towards reducing out-of-direction travel for autos, bicyclists, and pedestrians.
- Level of Service — ODOT has adopted plans with new standards for mobility during peak periods.
- Street design — New street design guidelines suggest options for narrower residential streets within newer subdivisions. In addition, the city should formalize its application of neighborhood traffic management tools. Furthermore, street improvements along arterials should be constructed to allow provision of fiber optic cable that is being installed to support new communication systems for monitoring and managing regional transportation conditions.
- Transit — As the city grows, a higher level of transit service could be added. Baseline policies were added to design streets and building orientations to better use a future fixed route transit system, support mixed-use centers, and expand services for transportation disadvantaged.

Transportation Plans

The existing system network for each mode (pedestrian, bicycle, motor vehicle, truck and other modes) was updated from the 1999 TSP to reflect completed projects since the original plan was completed. A Master Plan (long term project goals that meet planning requirements) and an Action Plan (projects that are reasonably expected to be funded) were compiled for each transportation mode. These plans are designed to comply with relevant State and adjoining jurisdictions planning documents. The overall findings and conclusions for each travel mode are summarized in the following sections. For full descriptions of the analysis, process, and projects, please refer to individual mode chapters: Chapter 5 – Pedestrian, Chapter 6 – Bicycle, Chapter 7 – Transit, and Chapter 9 – Motor Vehicles.

Pedestrians

A detailed inventory was conducted on collector and arterial streets in Redmond to identify where new or in-fill pedestrian facilities would be most valuable. Key issues included an incomplete arterial/collector sidewalk system, a lack of arterial pedestrian crossings facilities, especially on state highways, and a lack of connected multi-use trails.

The Pedestrian Master Plan was created that cost $46.2 million to add facilities to meet all these needs. The project locations are illustrated in Figure 6-1, which is duplicated following this section. Of these, about $9.4 million was found to be high priority, based on a ranking of pedestrian strategies by the Project Advisory Committee (PAC). The highest valued pedestrian facilities, such as facilities near schools, retail centers, and community centers were selected for the Action Plan. The highest-ranking City projects to be funded over the next 20 years are listed below in Table 1-1.

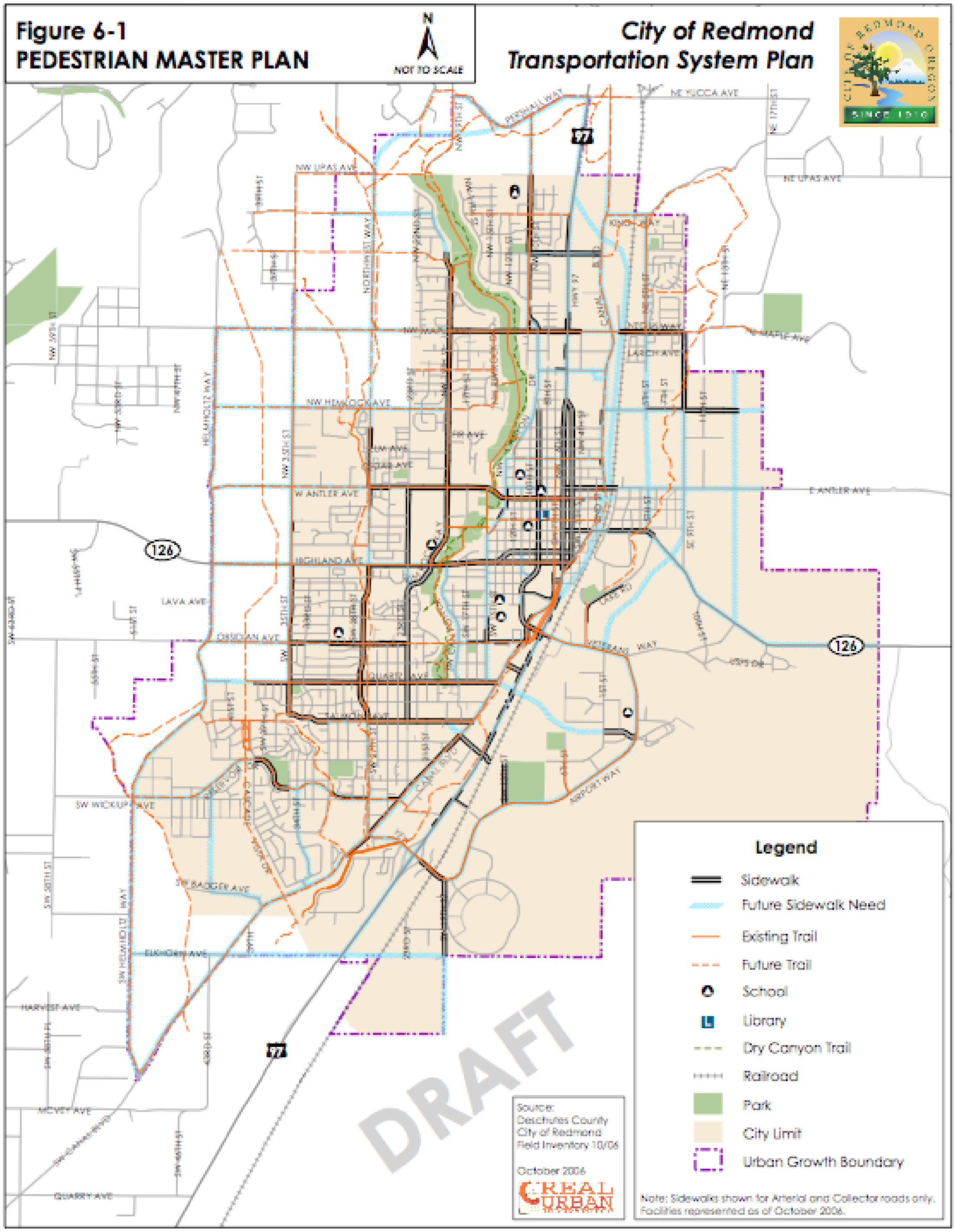
Table 0-1: Pedestrian System Action Plan

Project Facility	From	To	Cost ($1,000s)
Sidewalks on Existing Arterials and Collectors			
NW 9th St	Highland Ave	Maple Ave	$330
W Antler Ave	Helmholtz Way	23rd St	$1,270
SW 15th St	OR 126	SW Obsidian Ave	$215
SW Obsidian Ave	SW Helmholtz Way	SW 31st St	$870
SW Wickiup Ave	SW 35th St	SW Canal Blvd	$305
NW 10th St	NW Spruce Ave	NW Maple Ave	$135
NW Dogwood Ave	NW Canyon Dr	NW Canal Blvd	$315
NW Canyon Dr	NW 9th St	OR 126	$495
SW Canyon Dr	OR 126	SW Quartz Ave	$330
W Antler Ave	Canyon Dr	9th St	$240
SE/SW Airport Way	SE Veterans Way	SW 19th St	$2,435
SW Obsidian Ave	SW 23rd St	SW Canal Blvd	$415
		Existing Facilities Subtotal	**$7,355**

Project Facility	From	To	Cost ($1,000s)
Pedestrian Crossing Enhancements (Approximately every 500 feet)			
Helmholtz Way Enhancements (35)	NW Maple Ave	SW Wickiup	$350
US 97 Enhancements (27)	US 97 Reroute	South UGB	$270
OR 126 Enhancements (17)	West UGB	SW 15th St	$170
OR 126 Enhancements (17)	SE Lake Rd	East UGB	$170
		Crossing Enhancements Subtotal	**$960**
Other Pedestrian Projects			
ADA Enhancement Program	Location to be determined following ADA audit to establish existing framework		$50/year
		PEDESTRIAN ACTION PLAN COST	**$9,370**

The total Pedestrian Action Plan cost is $9.4 million. This total cost includes sidewalk retrofits on existing streets, and pedestrian crossing enhancements. The cost of new sidewalks on new streets are included in the street cost estimates reflected in Chapter 9, and not explicitly represented in the Pedestrian Action Plan. Similarly, the costs for off-street pathways are included in the Bicycle Action Plan, in Chapter 7. Refer to Table 6-2 for a complete list of Action Plan projects.

DKS Associates
TRANSPORTATION SOLUTIONS



Bicycles

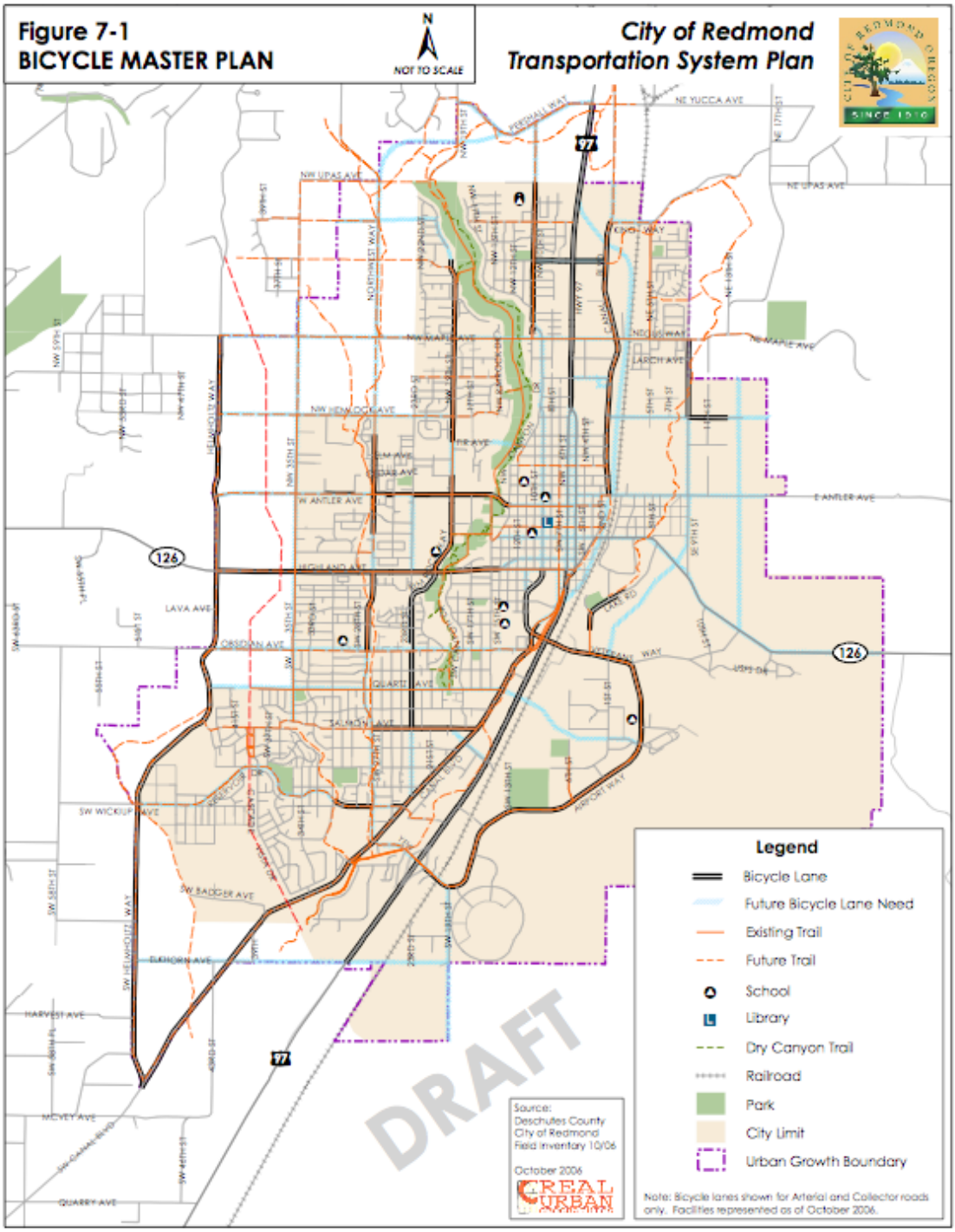
The bicycle system network map from the 1999 TSP was updated to reflect completed projects. The majority of the collector and arterial routes in Redmond do provide bike lanes. Consequently, the existing bike lane system provides generally adequate connections to schools, parks, and retail centers. Two areas were highlighted: better connectivity to neighborhoods, and availability of bicycle parking outside of the downtown area.

A Bicycle Master Plan was created that cost $31.6 million to implement in today's dollars. The Master Plan is shown in Figure 7-1, which is duplicated on the next page. Refer to Table 7-1 for additional details about the Master Plan projects. The highest priority bicycle projects totaled about $9.4 million, based on a ranking of bicycle strategies by the Project Advisory Committee (PAC). The Action Plan costs include retrofits on existing streets, and off-street pathways (previously noted in the Pedestrian Action Plan). The bicycle lanes on new streets are included in the street cost estimates reflected in Chapter 9. Refer to Table 7-2 for a complete list of Bicycle Action Plan projects, including expected implementation phasing over the life of the plan.

Table 1-2: Bicycle Action Plan Projects and Cost Estimates

Project Facility	From	To	Cost ($1,000s)
Bicycle Lanes on Existing Arterials and Collectors			
W Antler Ave	Helmholtz Way	23rd St	$1,630
SW Obsidian Ave	SW 23rd St	SW Canyon Dr	$140
		Existing Facilities Subtotal	**$1,770**
Off-street Bicycle Pathways			
NS BPA Trail	NW Maple Ave/N UGB	SW Elkhorn Ave	$1,590
Dry Canyon Trail	SW Highland Ave	SW Quartz Ave	$320
NS Canal Trail	North UGB (Oak)	Existing Trail (S of Hem.)	$445
NS Canal Trail	North UGB (Upas)	Existing Trail (S of Hem.)	$835
NS Canal Trail	SW Salmon Ave	SW Canal Blvd (near Greens Blvd)	$435
NS Canal Trail	Existing Trail (S of Antler)	Existing Trail (S of Canal)	$960
NS Canal Trail	Existing (@Obsidian)	Existing Trail (Yew)	$625
NS Canal Trail	NE Maple Ave	Firemans's Pond Park	$835
Dry Canyon Trail	NW Pershall Way	NW Upas Ave	$250
EW Canal Trail	NE Canal (@Quince)	NE 5th St	$225
EW Canal Trail	NE 5th St	East UGB	$100
NS Canal Trail	SW Helmholtz Way	SW Canal Blvd	$1,050
		Off-Street Facilities Subtotal	**$7,670**
Other Projects			
Bicycle parking	Downtown locations, key destinations, and activity centers		$10
		BICYCLE ACTION PLAN TOTAL	**$9,440**

DKS Associates
TRANSPORTATION SOLUTIONS



Transit

As Redmond population grows, and more employment opportunities are provided within the city, it is expected that a transit system will become a necessary to adequately balance transportation infrastructure with user needs. To begin planning for this system, the City of Redmond has received a grant from ODOT to undertake a Transit Feasibility Study, which will assess the viability of transit service in Redmond and make recommendations for locations of transit routes, the frequency of service, and user amenities that should be considered at transit stop locations. This TSP identifies needs for future transit service and placeholder strategies that should be implemented to address them.

Several improvement strategies were developed to meet transit needs in Redmond. These strategies were ranked as part of this TSP[2]. The strategies, which rely on coordination with the City of Redmond as well as other regional transit service providers, include (listed in order of importance):

- Provide park-and-ride lots and support van pools/car pools
- Provide commuter service to Bend
- Update roadway design standards to support fixed-route transit service
- Improve the dial-a-ride program (frequency and scheduling)
- Expand regional transit services to surrounding communities
- Provide shuttle service to key destinations
- Explore the feasibility of local fixed-route transit service
- Improve rail facilities to support recreational/commuter rail services

A $3 million transit action plan project list was created to identify projects to be funded by the year 2030, as listed in Table 1-3 below. A major share of those costs are related to providing commuter bus service from Redmond to Bend. The next major project is allocation / acquisition of space for park-and-ride lots.

Table 1-3: Transit Action Plan

Priority	Project	Description	Cost
High	Park-and-ride lots	Implement park-and-ride lot to serve transit and carpool users. Specific location to be determined.	$500,000
High	Transit stop amenities	Construct or plan for future transit stop amenities such as shelters, schedules, lights, and benches	$250,000
High	Commuter service	Provide commuter service to Bend	$100,000 / Year
		Transit Project Total	**$3,050,000**

[2] Technical Advisory Committee Meeting, September 26, 2007.

Motor Vehicle

A broad set of measures were reviewed to best serve growth in the City of Redmond, and it more than doubles in its current population over the next 20 years. Future travel forecasts showed that current planned improvements will not be sufficient to serve long-range growth to 2030, so other measures are required. Reliable and efficient travel on major city and state facilities within the city will require significant investments in Transportation System Management (TSM), Travel Demand Management (TDM), and roadway improvements. A variety of roadway and highway improvement alternatives were analyzed for meeting these needs. The following sections summarize the recommended motor vehicle system plans that meet the demands of future growth and comply with local and state planning requirements.

Street System Design

The 1999 TSP established a functional street classification system for Redmond that includes arterials (major and minor), and collectors (major and minor) for primary travel routes. Changes in the city's urban growth boundary, the addition of the US 97 Re-Route and consideration of on-going neighborhood traffic management issues were addressed by modest changes to the functional class hierarchy. In brief, they are:

- The new US 97 Reroute was classified as a major arterial consistent with other state highways in the city,
- The existing US 97 alignment on 5th / 6th Avenues was downgraded to minor arterial,
- Several streets around the new interchange with US 97 and the existing intersection at O'Neill Highway were redesigned to anticipate long-term changes in access in that part of the city,
- Several key neighborhood streets were classified as minor collector routes, which will be the target for primary Neighborhood Traffic Management solutions,
- Veterans Way and 9th Avenue near the airport protection zone was re-aligned and changed to anticipate the future extension of the Redmond Airport runways,
- Pershall Way and Helmholtz Avenue was upgraded to minor arterial as part of the Westside Arterial corridor element of the TSP, and
- The second phase of the US 97 Re-Route identified in the *US 97 Refinement Plan* as been added to the Functional Class Map.

A revised functional classification map is illustrated in Figure 9-1, which is duplicated on the next page.

In addition, two conceptual roadway extensions are indicated for lands outside the city limit and urban planning area to guide future roadway planning. The first is located in the northwest corner of the map, which would provide a more direct route for the Westside Arterial corridor. The second is in the southeast corner of the map, and it provides guidance for an southerly extension of SE 19th Avenue to an ultimate connection near Quarry Avenue, and extension south to Deschutes-Market Road. Since these concept areas are outside the influence area of the city, they are only guides if and when the urban growth boundary (or an urban reserve area) is extended beyond it present boundary.

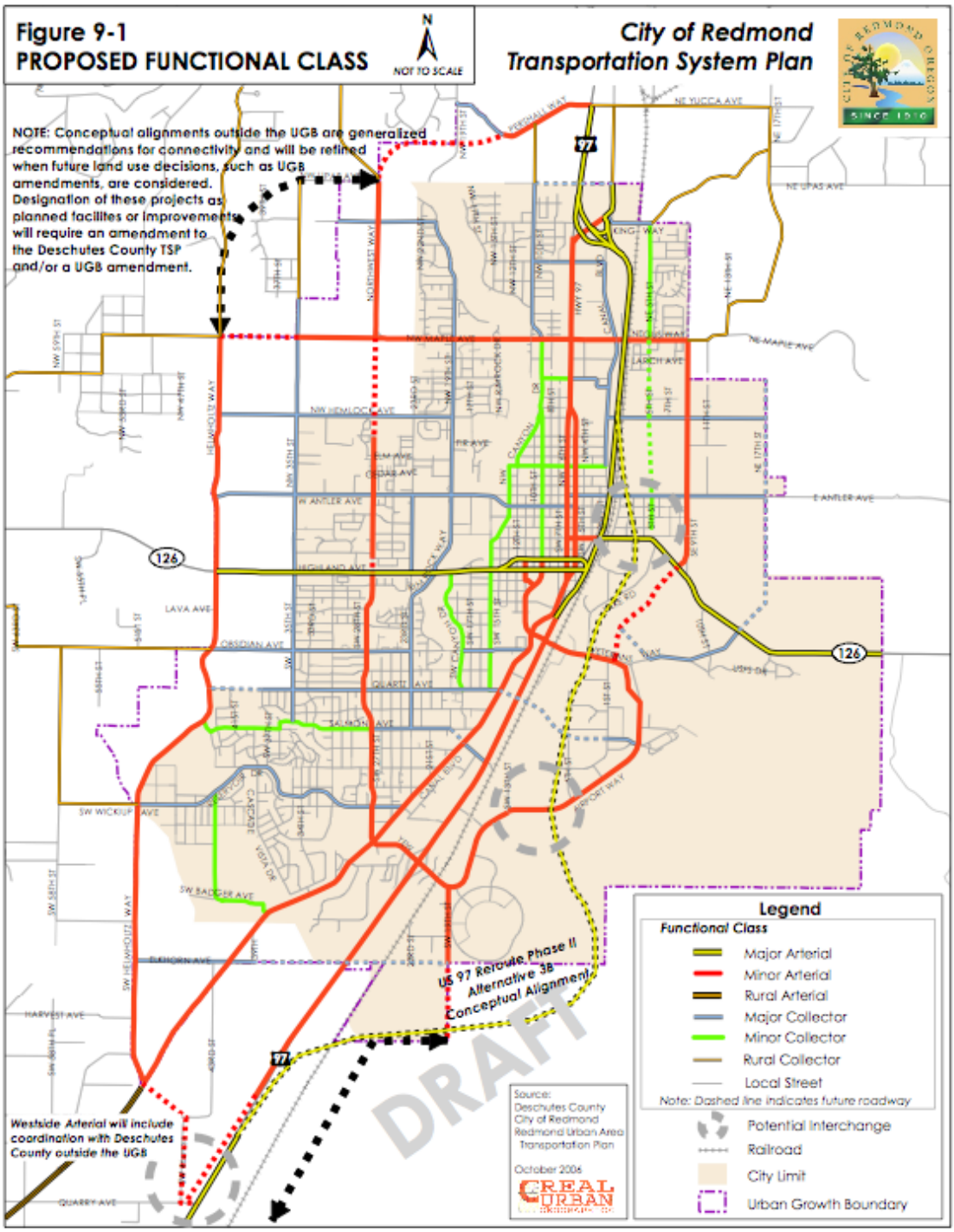


Figure 9-1
PROPOSED FUNCTIONAL CLASS
N
NOT TO SCALE
City of Redmond
Transportation System Plan
NOTE: Conceptual alignments outside the UGB are generalized recommendations for connectivity and will be refined when future land use decisions, such as UGB amendments, are considered. Designation of these projects as planned facilites or improvements will require an amendment to the Deschutes County TSP and/or a UGB amendment.
US 97 Reroute, Phase II
Alternative 3B
Conceptual Alignment
Westside Arterial will include coordination with Deschutes County outside the UGB
DRAFT
Legend
Functional Class
Major Arterial
Minor Arterial
Rural Arterial
Major Collector
Minor Collector
Rural Collector
Local Street
Note: Dashed line indicates future roadway
Potential Interchange
Railroad
City Limit
Urban Growth Boundary
Source:
Deschutes County
City of Redmond
Redmond Urban Area
Transportation Plan
October 2006
CREAL URBAN

Transportation System Management (TSM)

Transportation System Management (TSM) focuses on low cost strategies to enhance operational performance of the transportation system by seeking solutions to immediate transportation problems, finding ways to better manage transportation, maximizing urban mobility, and treating all modes of travel as a coordinated system. TSM measures focus primarily on region wide improvements, however there are a number of TSM measures that are recommended for use in Redmond, which include:

Intelligent Transportation Systems (ITS): ITS focuses on increasing the efficiency of existing transportation infrastructure, which enhances the overall system performance and reduces the need to add capacity (e.g. travel lanes). Efficiency is achieved by providing services and information to travelers so they can (and will) make better travel decisions and to transportation system operators so they can better manage the system and improve system reliability. The ITS master plan for Redmond refines a previous ITS plan done by Deschutes County, and provides equipment and communication devices to better manage local travelers. The tools include:

- *Closed circuit TV cameras for use by traffic control centers and general public road conditions reporting.*
- *Variable message signs to inform drivers at strategic decision points about upcoming roadway conditions.*
- *Automated Traffic Recorders to monitor historical and seasonal travel patterns to better understand local conditions throughout the year.*
- *Advanced rail warning systems at all grade-crossing locations.*
- *Communication nodes at city public works and airport facilities to allow communications with ITS devices.*

The following actions should be taken as part of this TSP:

- *Adopt the ITS Master Plan Map, which supplements and refines the general ITS plan prepared for Deschutes County, and shows planned ITS devices and communications in the Redmond area.*
- *Modify City of Redmond standards to include installation of 3" conduit during roadway improvement projects to support the interconnect infrastructure shown in the ITS Master Plan.*

Neighborhood Traffic Management (NTM): The City of Redmond has should adopt a Neighborhood Traffic Management Program to establishes a process to guide implementation of any traffic calming through neighborhood involvement. This program would help prioritize implementation and address issues on a systematic basis rather than a reactive basis. Criteria should be established for the appropriate application of NTM in the City. This would address warrants, standards for design, funding, the required public process, use on collectors/arterials (fewer acceptable measures) and how to integrate NTM into all new development design. NTM projects

on state facilities are required to meet ODOT standards. Pavement textures, chokers, on-street parking and traffic circles are prohibited on state highways.

Access Management: Access Management is a broad set of techniques that balance the need to provide efficient, safe and timely travel with the ability to allow access to the individual destination. Proper implementation of Access Management techniques should guarantee reduced congestion, reduced accident rates, less need for highway widening, conservation of energy, and reduced air pollution.

The following recommendations are made for access management:

- *Update the access management plan for US 97 corridor.*
- *Update the City's policy statement to include maximum spacing recommendations by street functional class, as shown in Table 1-4.*
- *Use ODOT standards for access on highways under their jurisdiction.*
- *Specific access management plans should be developed for arterial streets in Redmond to maximize the capacity of the existing facilities and protect their functional integrity. New development and roadway projects should meet the requirements summarized in Table 1-4. The minimum spacing of roadways and driveways listed in this table is consistent with Multnomah County's access spacing standards.*

Table 0-4: Access Management Standards

Street Facility	Minimum Posted Speed (mph)	Minimum Spacing between Driveways and/or Streets	Minimum Spacing between Intersections	Maximum Spacing between Intersections
Arterial Streets				
Minor Arterial – Downtown Core Grid System	20-25	165 ft	330 ft	660 ft
Major Arterial – Other Areas	35-50	800 ft	½ mile	1 mile
Minor Arterial	30-45	330 ft	¼ mile	½ mile
Collector Streets				
Major Collector	25-35	165 ft	330 ft	660 ft
Minor Collector	25-35	80 ft	330 ft	660 ft
Industrial Collector	25-35	165 ft	330 ft	1,320 ft
Local Streets				
Local Industrial	20-25	*access to each lot*	330 ft	1,320 ft
Local Residential	20-25	*access to each lot*	330 ft	660 ft

Note: The minimum spacing shown for each category is a desirable design spacing for future development; existing spacing will vary.

Roadway Extensions to Improve Circulation

Much of the existing local street network, especially in the downtown area, provides good connectivity with multiple options for travel in any direction. However, some of the newer residential neighborhoods have been developed with limited opportunities for movement into and out of the developments, with some neighborhoods funneling all traffic onto a single street. This type of street network results in out-of-direction travel for motorists and contributes to an imbalance of traffic volumes, which impacts residential frontage. This can result in the need for investments in wider roads, traffic signals and turn lanes that could otherwise be avoided.

A Local Street Connectivity Plan was developed for Redmond, which is shown in Figure 9-5, which is duplicated on the following page. In most cases, the connector alignments are not specific and are aimed at reducing potential neighborhood traffic impacts by better balancing traffic flows on neighborhood routes. To protect existing neighborhoods from potential traffic impacts of extending stub end streets, connector roadways should incorporate neighborhood traffic management into their design and construction. All stub streets should have signs indicating the potential for future connectivity. Additionally, new development that constructs new streets, or street extensions, are required by the current development code to meet the following connectivity standards:

- *Provides full street connections with spacing of no more than 530 feet between connections except where prevented by barriers*
- *Provides bike and pedestrian access ways in lieu of streets with spacing of no more than 330 feet except where prevented by barriers*
- *Limits use of cul-de-sacs and other closed-end street systems to situations where barriers prevent full street connections*
- *Includes no close-end street longer than 200 feet or having no more than 25 dwelling units*
- *Includes street cross-sections demonstrating dimensions of ROW improvements, with streets designed for posted or expected speed limits.*

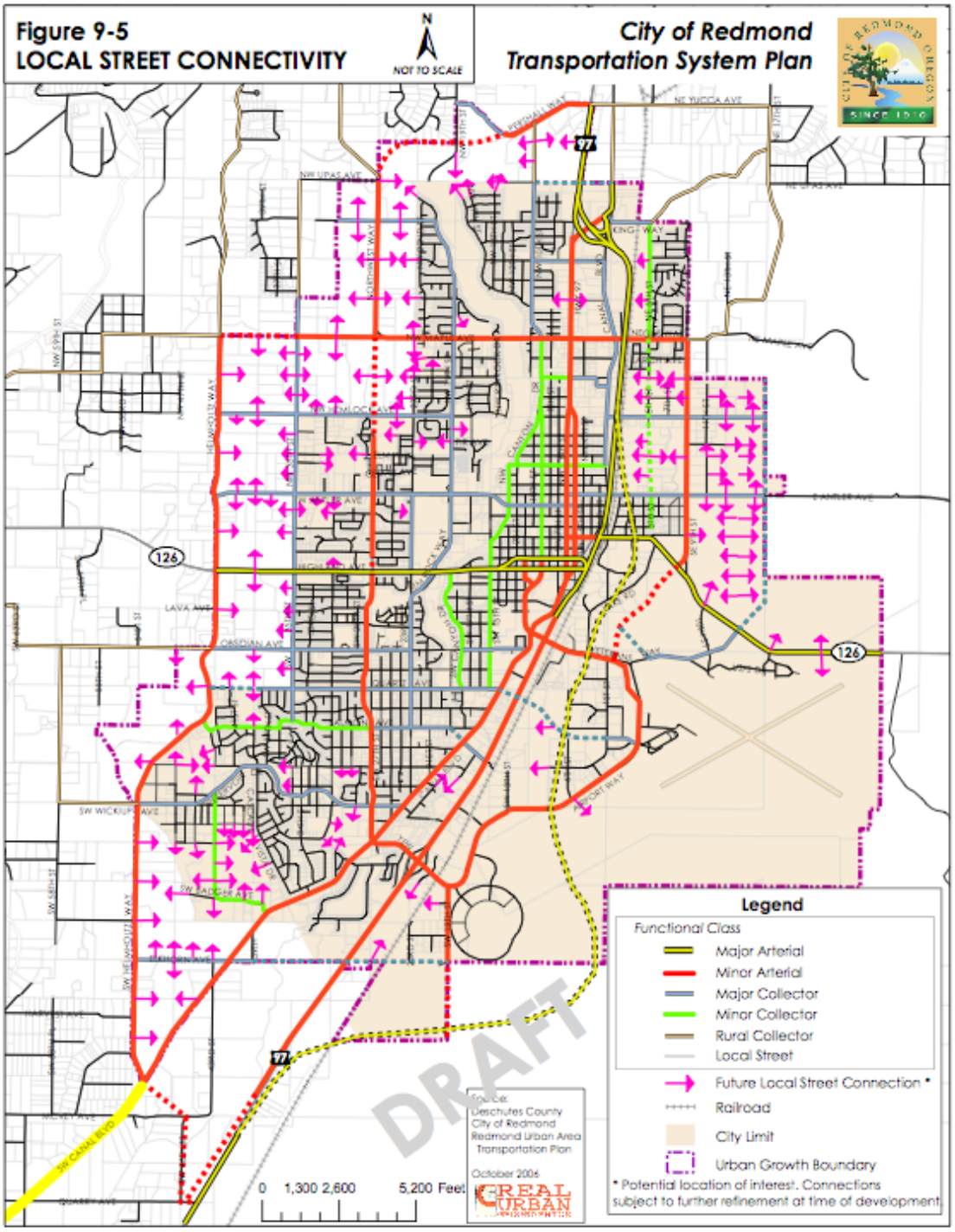


Figure 9-5
LOCAL STREET CONNECTIVITY
NOT TO SCALE
City of Redmond
Transportation System Plan
Legend
Functional Class
Major Arterial
Minor Arterial
Major Collector
Minor Collector
Rural Collector
Local Street
Future Local Street Connection *
Railroad
City Limit
Urban Growth Boundary
* Potential location of interest. Connections subject to further refinement at time of development
Source:
Deschutes County
City of Redmond
Redmond Urban Area
Transportation Plan
October 2006
0 1,300 2,600 5,200 Feet
DRAFT

Transportation Demand Management (TDM)

Transportation Demand Management (TDM) is the general term used to describe any action that removes single occupant vehicle trips from the roadway network during peak travel demand periods. As growth in the Redmond area occurs, the number of vehicle trips and travel demand in the area will also increase. The ability to change a user's travel behavior and provide alternative mode choices will help accommodate this growth.

The City of Redmond and Deschutes County should coordinate to implement the pedestrian, bicycle, and transit system improvements, which offer alternative modes of travel. The recommended TDM action plan includes:

- *Encourage developments that effectively mix land uses to reduce vehicle trip generation. These plans may include development linkages (particularly non-auto) that support greater use of alternative modes.*
- *Implement a motor vehicle maximum parking ratios for new development, to supplement existing policies for minimum parking ratios. .*
- *Continued implementation of street connectivity requirements.*
- *Require new development to install bicycle racks.*
- *Implementation of bicycle, pedestrian, motor vehicle and transit system action plan.*
- *Monitor and manage the parking needs in the Redmond Downtown, which could include long-term strategies such as parking pricing.*

Roadway Improvements

By 2030, several of the major city arterials and state highway facilities in Redmond will not be able to serve peak traffic demands on a regular basis. Key issues to address include:

- ***Lack of north-south capacity**. The primary north-south arterial route is US 97 throughout the length of the city. Adding the Westside Arterial Corridor improvements are essential to serve growth in the western half of the city, but critical shortfalls are forecasted south of Highland Avenue by 2030. Additional north-south capacity is needed to relieve this corridor, and to better serve employment and industrial growth in the eastern half of the city. Concepts tested during the TSP update included the southern extension of the US 97 Re-route, expanding South Canal Boulevard, and extending SE 19th Street to parallel a southerly connection to US 97.*
- ***Lack of alternative access to the airport and county fairgrounds area**. The primary route to the southwest corner of the city is via the Yew Avenue interchange with US 97. Traffic congestion associated with large events at the fairgrounds substantially impacts regional routes, including long*

queues on US 97. Alternative transportation access to these regional facilities would help to less impacts of peak event demands, and provide local circulation options during non-event days. Local circulation options considered an new US 97 overcrossing at Elkhorn Boulevard, a new east-west connection at Quartz Avenue, and extending SE 19th Street to parallel a southerly connection to US 97.

- ***Lack of east-west capacity.*** *OR 126 is the primary highway for regional destinations west or east of the city. By 2030, traffic growth will exceed existing carrying capacity, and further improvements will be needed. Opportunity to expand parallel routes to OR 126 were considered, but now viable alternatives were identified because of existing development. Highway expansion projects were identified to provide adequate improvements to meet state mobility standards. In addition, local circulation constraints posed by US 97 and railroad were addressed by new facilities that cross over them at a separate grade. New overcrossings are identified at Elkhorn Road and NW Upas Road.*
- ***Modernization of rural roadways.*** *There are many existing two-lane rural roadways in town that will need to be upgraded to full urban standards, as development extends outward. This is most significant in the northwest and eastside areas of town, where existing arterial and collector streets are built to a rural standard. As urban development fill in, these basic facilities will need to improved to add turn lanes for higher traffic volumes, and dedicated facilities for pedestrian and bicycle travel. The modernization cost of road upgrades is a significant element of the overall roadway improvement program.*

Based on the needs identified above, a Motor Vehicle Master Plan was created that includes $112.8 million for roadway improvements, $6.5 million at intersections on city arterials and collector roadways, and another $25.6 million on state highways, and another $8 million at intersections.

City street projects summarized in Table 1-5 include all the master plan projects within their jurisdiction. All of those projects were included in the Action Plan, so, for this case, the Master Plan and the Action Plan list are the same.

Table 1-5: Motor Vehicle Master Plan Improvements – City of Redmond Facilities

Location	Description	Project (#)	Planning Cost (x$1,000)
NW Upas Ave	Grade-separated crossing of US 97	14	$3,940
Westside Arterial	O'Neil to Quarry	(Various)	$50,575
NW 27th Ave	Widen to 3 lanes from Maple Avenue to Greenwood	15	$2,640
SW Canal Blvd	Widen to 3 lanes from SW Obsidian Ave to Yew Ave	16	$7,560
SW 19th St	Extend to Deschutes Market Road as 2-lane collector	17	$7,250

Location	Description	Project (#)	Planning Cost (x$1,000)
SW Quarry Rd	Connect US 97 to 19th Street extension	18	$2,730
NW O'neill Ave	Grade-separated crossing of US 97	19	$1,930
NE 17th St	Eastside collector from OR 126 to Antler Ave	20	$3,200
SE 9th St	Extend from Veterans Way to OR 126 as Minor Art	31	$2,925
E 9th St	Improvements from OR 126 to Hemlock Ave	33	$2,730*
SW Odem Medo Rd	Corridor Improvements	35	$1,040*
SW 15th St	Improvements from SW Quartz to SW Obsidian Ave	36	$480*
Forked Horn Butte	Wickiup Ave to S Canal Blvd Connection	37	$2,650
SW Elkhorn Ave	Helmholtz Way to S Canal Blvd	60	$1,735
SW Obsidian Ave	Western UGB to 35th Street	62	$1,520
W Antler Ave	Helmholtz to 35th Street	63	$1,520
NW 35th St	NW Hemlock to NW Oak Avenue	64	$2,150
NW Spruce Ave	NW 22nd to NW 33rd	65	$1,430
NW 10th St	NW Upas Ave to NW Pershall Way	66	$1,140
NE 5th St	NE Hemlock to E Antler Avenue	67	$1,230
SW Canal Blvd	Widening from SW Yew Ave to SW Badger Ave	68	$3,785
SW Canal Blvd	SW Badger Ave to SW Helmholtz Way	69	$4,465
SW Wickiup Ave/ Reservoir Dr	SW 31st to SW 35th, SW 39th to Helmholtz Way	70	$2,790
SW Veterans Way	Add a center turn lane from RxR to SE 1st St	71	$1,375
	Master Plan Total		**$112,790**

* Costs provided in CIP lists and increased 8% annually to 2007 costs to account for inflation

Major street projects on ODOT facilities are listed in Table 1-6. The most significant project is the US 97 Reroute extension, which accounts for the majority of the total cost. This project and the potential interchange at Airport Road was not included in the Action Plan list, given this high cost and shortfall of state funding in this region.

Table 1-6: Motor Vehicle Master Plan Improvements – ODOT Facilities

Location	Description	Master Plan Project	Action Plan Project (#)	Planning Cost (x$1,000)
Hwy 126	Widen to 3 lanes from Helmholtz to 35th Avenue	X	8	$1,555
Hwy 126	Widen to 5 lanes from 35th Avenue to Rimrock Way	X	9	$5,330
Hwy 126	Widen to 3 lanes from US 97 Reroute to Vet Way	X	10	$7,535
US 97 Reroute Extension*	Extend Reroute Alt 3B to Quarry interchange (no Airport Way interchange)	X		$226,140**
Airport	Reroute interchange at Airport	X		$6,450**

Location	Description	Master Plan Project	Action Plan Project (#)	Planning Cost (x$1,000)
Interchange*	Avenue			
US 97/Quarry Ave	Westside Arterial/Quarry Ave Interchange	X	13	$11,250
	Master Plan Total			**$258,260**
	Action Plan Total			**$25,670**

* Included in Master Plan but not reflected in Action Plan or intersection performance listed in Table 9-7.
** Costs provided in US 97 Refinement Plan Study for Alternative 3B. Cost of Airport Way interchange was removed from the total and listed separately.

The city is already committed to several roadway improvements that are listed in the existing Capital Improvement Program. These projects and their associated costs, along with the city and ODOT improvement projects identified in the Action plan are summarized in Table 1-7, with the total of $174.1 million. For illustration purposes, a local match of 20 percent of construction costs was assumed for ODOT projects, however this does not represent a commitment by the city for this amount. There may be other opportunities or means to support state project on the Action Plan list.

The Action Plan map is illustrated in Figure 9-8, which is duplicated on the next page. Project numbers shown on the map correspond with value listed in the foregoing tables.

Table 1-7: Motor Vehicle Action Plan Cost Summary

Project Type	Cost
Currently Funded CIP Projects	$18,850
ODOT Facility Capacity Improvements - Local Match*	$24,585
City of Redmond Facility Capacity Improvements	$112,790
ODOT Facility Intersection Improvements – Local Match*	$8,000
City of Redmond Facility Intersection Improvements	$6,450
Additional Signalization Projects	$3,705
Total Motor Vehicle Action Plan Cost	**$174,115**

** Assumed to be 20% of total ODOT project cost*

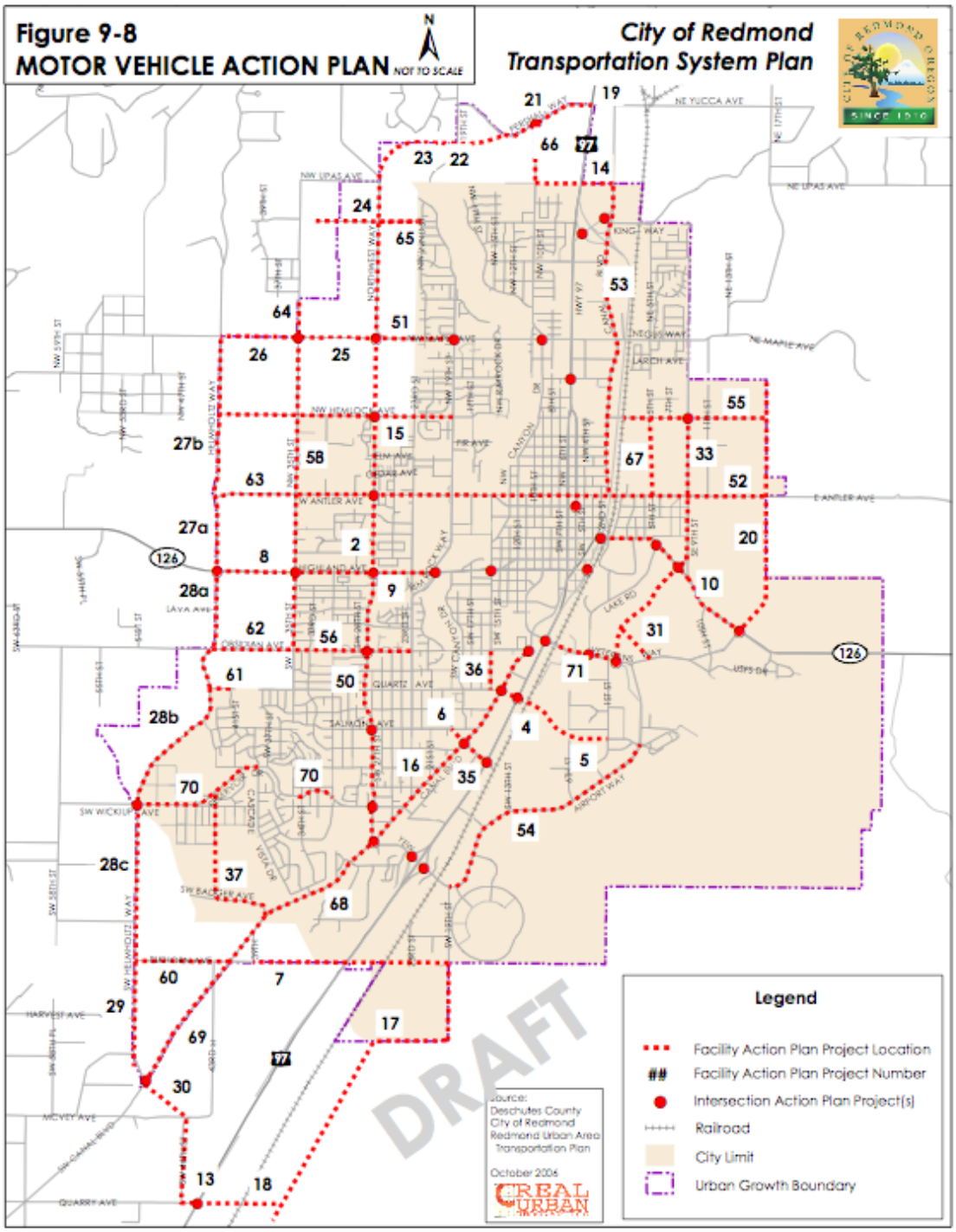


Figure 9-8
MOTOR VEHICLE ACTION PLAN
NOT TO SCALE
N
City of Redmond
Transportation System Plan
Legend
Facility Action Plan Project Location
Facility Action Plan Project Number
Intersection Action Plan Project(s)
Railroad
City Limit
Urban Growth Boundary
Source:
Deschutes County
City of Redmond
Redmond Urban Area
Transportation Plan
October 2004
DRAFT

Other Modes

While auto, transit, bicycle and pedestrian transportation modes have a more significant effect on the quality of life in Redmond, other modes of transportation must be considered. Future needs for rail, air and pipeline infrastructure are identified by their providers and are summarized below.

Rail

The existing conditions inventory identified nine existing at-grade rail crossing in the study area. This will be reduced by the construction of the US 97 North Reroute, which will grade separate the crossing at Negus Way. The planned roadway system in the City will construct roadways across the rail line at Quartz Avenue and at Elkhorn Avenue. The crossing at Quartz Avenue will be at-grade since grade separation is not feasible due to the proximity of US 97. The crossing at Elkhorn Avenue should be grade-separated for safety and to maintain freight and auto mobility.

Gas Pipelines

Cascade Natural Gas provides natural gas services in Redmond and the surrounding area. The existing pipelines in Redmond are outside of the maintenance responsibilities of the City. As such, no policies or recommendations in this area of transportation are provided for Redmond.

Air

The future growth and expansion of Roberts Field will affect the transportation network of Redmond in several ways. Aside from general growth and the associated traffic use around the airport, two roadway realignment projects (Veterans Way/Airport Way Relocation, and OR 126 Reroute) on the CIP list are associated with providing clearance for runway protection zones and will have a direct impact on the roadway system in Redmond. The realignment of Veterans Way/Airport Way is consistent with the planned extension of SE 9th Street connection to OR 126, and future roundabout control presented in the motor vehicle master plan. The OR 126 Reroute will affect the alignment of the highway but does not impact any local connections.

Financing

Transportation funding is commonly viewed as a user fee system where the users of the system pay for infrastructure through motor vehicle fees (such as gas tax and registration fees) or transit fares. However, a great share of motor vehicle user fees goes to road maintenance, operation and preservation of the system rather than construction of new system capacity. Much of what the public views as new construction is commonly funded (partially or fully) through property tax levies, traffic impact fees and fronting improvements to land development. The City of Redmond utilizes a number of mechanisms to fund construction of its transportation infrastructure, including:

- Fuel Tax and Vehicle License Fee
- System Development Charge
- Urban Renewal Funds
- Exactions (Developer Required Improvements)

Under the above funding programs, the City of Redmond will collect approximately $5.6 million for street construction and repair each year. Over the 23-year life of this planning period, that is equivalent to $133 million in today's dollars.

The costs outlined in the Transportation System Plan to implement the Action Plans for Streets, Transit, Bicycles, and Pedestrians total $210.8 million, and several other recommended transportation operations and maintenance programs would add $43.8 million for a total cost over 23 years of $254.5 million. This total exceeds the expected 23-year revenue estimate of $133.2 million by approximately $121.3 million. Alternative solutions to address this funding deficit for the Action Plan projects are discussed in the next section.

Table 0-8: Redmond Transportation Action Plans Costs over 23 years (2007 Dollars)

Transportation Element	Approximate Cost ($1,000)
System Improvement Projects (Action Plans projects to be funded by City)	
Motor Vehicle	$174,115
Roadway Reconstruction/Modernization	$18,170
Bicycle	$9,440
Transit	$750
Pedestrian	$8,315
Total Capital Projects	**$210,790**
Operations and Maintenance Programs and Services	
Roadway Maintenance ($1,752,000 per year)	$40,300
ADA Enhancement Program ($50,000 per year)	$1,150
Local Transit Operations ($100,000/yr)	$2,300
Total Operations and Maintenance Programs	**$43,750**

Transportation Element	Approximate Cost ($1,000)
23 YEAR TOTAL COST	***$254,540***
23 YEAR TOTAL FUNDING	***$133,249***
23 YEAR ADDITIONAL NEED	***$121,291***

Note: in 2007 Dollars

The estimated $210 million for capital projects and maintenance exceeds the expected revenue estimate of $133 million by approximately $121 million. Alternative solutions to address this funding deficit for the Action Plan projects were analyzed, including General Fund Revenues, Voter-Approved Local Gas Tax, Street Utility Fee Revenues, Expanded Transportation SDC, and Debt Financing. It is recommended that the City consider establishing a transportation, or street, utility as the backbone of its operations and maintenance funding approach. It is also recommended that the City consider updating its transportation SDC to cover the new City funded capital projects identified in the TSP. In addition, the City should actively pursue grant and other special program funding in order to mitigate the costs to its citizens of transportation capital construction.

The City shall consider establishing a transportation utility fee as the backbone of its operations and maintenance funding approach. Street utility fees provide a stable source of dedicated revenue useable for transportation system operations and maintenance and/or capital construction. Rate revenues also secure revenue bond debt if used to finance capital improvements. Transportation utilities will be formed by Council action, and billed through the City utility billing system (e.g. water bills).

The City should also consider increasing the System Development Charges (SDCs) to fund the capital projects portion of the TSP Action Plan. An increase from the current amount of $2,877 to $4,700 per PM peak hour trip could generate an additional $38.6 million over the next 23 years.

A transportation utility fee and an increased SDC could generate approximately $36 million in additional funds over the next 23 years, as shown in Table 1-9. If development exactions were also pursued, total additional funds would be approximately $121.6 million, which meets the amount of additional funds needed ($121.3 million) as identified in Table 1-8. These additional funds are expected to reasonably generate sufficient revenues to fully fund the Action Plan projects and maintenance programs.

Table 0-9: Recommended New Funding Sources for Transportation Programs

Transportation Funding Source	Estimated Revenue ($1,000)
SDC – Additional Share (Increase by $1,823 / trip)*	$38,648
Exactions	$46,762
Transportation Utility Fee**	$36,230
23 YEAR TOTAL ADDITIONAL FUNDING (in 2007 Dollars)	**$121,640**

* Note that this additional revenue is based on a $4,700 / trip

SECTION 5-2: DRAFT TRANSPORTATION CAPITAL IMPROVEMENT PLAN

DRAFT (03/07/08) City of Redmond Transportation Capital Improvement Plan

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TSP Action Plan #	Project	Roadway Classification	Total 2007 Cost	State/ Federal	Urban Renewal Funding	ODOT Devel Collected Funding	Des. Co SDC Funding	Existing City Funding	Existing Developer Funding	Est. Devel. Frontage Imps (Local Portion)	Estimated City Funding (Gas/Prop Tax)	OVERSIZE (SDC ELIGIBLE FUNDING)	Other Funding Needed
Phase 1: 2008 to 2015													
Transportation Demand Management Program			*$ 10,000*										*$ 10,000*
Motor Vehicle Projects													
50	SW 27th Street reconstruction and extension from Yew Avenue Interchange to Highland Avenue.	Minor Arterial	$ 6,999,160						$ 40,000		$ 3,104,000	$ 3,895,160	
35	Odem Medo Rd corridor capacity improvements	Major Collector	$ 1,040,000									$ 1,040,000	
2	27th Street extension from Highway 126 (Highland Avenue) to Antler Avenue (including traffic signal at 27th Street and Highland Avenue).	Minor Arterial	$ 1,775,475								$ 780,000	$ 1,495,475	
16	South Canal Boulevard widened to three lanes from Yew to Obsidian Avenue	Minor Arterial	$ 7,557,150						$ 19,000		$ 3,301,000	$ 4,237,150	
51	Maple Avenue reconstruction from NW 19th Street to NW 27th Street	Minor Arterial	$ 680,000						$ 75,000	$ 305,800		$ 299,200	
	US 97 NB/Yew - Traffic Signal	Intersection	$ 350,000						$ 25,000			$ 325,000	
	US 97 SB/Yew - Traffic Signal	Intersection	$ 350,000						$ 25,000			$ 325,000	
	NW 27th/Maple - Add a roundabout with two circulating and two entry and exit lanes at each approach	Intersection	$ 1,200,000									$ 1,200,000	
15	NW 27th Street - Widen to 3 lanes from Maple Ave to Greenwood	Minor Arterial	$ 2,639,340							$ 1,584,000		$ 1,055,340	
24	(Westside Arterial) NW 27th St-Pershall connection to Maple Ave	Minor Arterial	$ 5,258,685							$ 2,112,000		$ 3,146,685	
25	(Westside Arterial) NW Maple Ave-NW 27th St to 35th	Minor Arterial	$ 2,639,340							$ 1,056,000		$ 1,583,340	
27a	(Westside Arterial) Helmholtz Way-Antler to Hwy 126	Minor Arterial	$ 2,832,588							$ 1,056,000		$ 1,776,588	
28a	(Westside Arterial) Helmholtz Way-Hwy 126 to SW Obsidian Avenue	Minor Arterial	$ 2,784,276							$ 1,056,000		$ 1,728,276	
31	SE 9th St - Extend from OR 126 to Veterans Way	Minor Arterial	$ 2,926,760							$ 1,520,000		$ 1,406,760	
	E 9th/OR 126 - Traffic Signal, NB RT lane, EB RT lane, WB RT lane and EB/WB LT lanes	Intersection	$ 2,000,000									$ 2,000,000	
	Business 97 NB (5th)/Black Butte Ave - remove parking and restripe to add EB LT lane	Intersection	$ 50,000									$ 50,000	
68	S Canal Blvd Widening: Yew to Badger	Minor Arterial	$ 3,784,800							$ 960,000	$ 960,000	$ 1,864,800	
	Helmholtz Way/ OR 126 - Traffic signal, WB RT lane, NB RT lane	Intersection	$ 1,250,000									$ 1,250,000	
70a	SW Wickiup/SW Reservoir Drive Modernization: 31st to 35th, 39th to Helmholtz	Major Collector	$ 744,000							$ 320,000	$ 320,000	$ 104,000	
	Downtown Couplet (5th/6th Street) Reconstruction	Minor Arterial	$ 8,500,000					$ 2,500,000					$ 6,000,000
MV Subtotal			*$ 46,861,574*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 184,000*	*$ 9,969,800*	*$ 8,465,000*	*$ 28,782,774*	*$ -*
Bikeway Projects													
	W Antler Ave bike lanes from NW 35th to NW 23rd St	Bike	$ 395,000										
	Bicycle parking at downtown locations, key destinations and activity centers	Bike	$ 10,000										
Bike Subtotal			*$ 405,000*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*
Pedestrian/Trails Projects (See Parks CIP for SDC Funding associated with Trail Construction)													
	Dry Canyon Trail from SW Highland Ave to SW Quartz Ave	Ped/Trail	$ 320,000								$ 320,000		
	W Antler Ave Sidewalks from NW 35th Street to NW 23rd St	Ped	$ 1,270,000								$ 1,270,000		
	North-South BPA Trail from NW Maple Ave (N UGB) to SW Elkhorn Ave	Ped/Trail	$ 1,590,000								$ 651,900		
	North-South Canal Trail from North UGB (Oak) to Existing trail (S of Hemlock)	Ped/Trail	$ 445,000								$ 182,450		
	North-South Canal Trail from North UGB (Upas) to existing trail (S of Hemlock)	Ped/Trail	$ 835,000								$ 342,350		
	W Antler Ave from Canyon Dr to 9th St	Ped	$ 240,000								$ 240,000		
	ADA Enhancement	Ped	$ 400,000										
	NW 9th St sidewalk construction of missing links from Highland to Maple	Ped	$ 330,000								$ 330,000		
	SW 15th St sidewalk construction of missing links from Highland to Obsidian Ave	Ped	$ 215,000								$ 215,000		
	NW 10th St sidwalk construction of missing links from Spruce to Maple	Ped	$ 135,000								$ 135,000		
	NW Canyon Dr sidewalk construction of missing links from NW 9th to Highland	Ped	$ 495,000								$ 495,000		
	SW Canyon Dr sidwalk construction of missing links from Highland to SW Quartz	Ped	$ 330,000								$ 330,000		
Ped/Trails Subtotal			*$ 6,605,000*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 4,511,700*	*$ -*	*$ -*
Transit Projects													
	Provide commuter service to Bend	Transit	*$ 800,000*										*$ 800,000*
	Transit stop amenities	Transit	*$ 250,000*										*$ 250,000*
	Park and Ride lots	Transit	*$ 500,000*										*$ 500,000*
Transit Subtotal			*$ 1,550,000*										*$ 1,550,000*
Total Phase 1			***$ 55,421,574***	***$ -***	***$ -***	***$ -***	***$ -***	***$ -***	***$ 184,000***	***$ 9,969,800***	***$ 12,976,700***	***$ 28,782,774***	***$ 1,550,000***
Phase 2: 2016-2020													
Motor Vehicle Projects													
2005-1A	TRANSPORTATION SYSTEM PLAN/CIP UPDATE											$ 200,000	

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TSP Action Plan #	Project	Roadway Classification	Total 2007 Cost	State/ Federal	Urban Renewal Funding	ODOT Devel Collected Funding	Des. Co SDC Funding	Existing City Funding	Existing Developer Funding	Est. Devel. Frontage Imps (Local Portion)	Estimated City Funding (Gas/Prop Tax)	OVERSIZE (SDC ELIGIBLE FUNDING)	Other Funding Needed
23	(Westside Arterial) Pershall Way-Dry Canyon (W) to NW 27th Street	Minor Arterial	$ 2,588,950							$ 1,400,000		$ 1,188,950	
8	SW Highland Avenue (Hwy 126) - widen to 3 lanes Helmholtz to 35th (ODOT funds LTL at Helmholtz in 2008/09)	Major Arterial	$ 1,555,550							$ 1,060,000		$ 495,550	
4	SE/SW Quartz Avenue extension from South Canal Boulevard to RxR (including traffic signal at Quartz Avenue and Highway 97).	Major Collector	$ 2,325,000								$ 1,290,375	$ 1,034,625	
27b	(Westside Arterial) Helmholtz Way-NW Maple to Antler	Minor Arterial	$ 5,665,176							$ 2,112,000		$ 3,553,176	
28b	(Westside Arterial) Helmholtz Way-SW Obsidian Ave to SW Wickiup Ave	Minor Arterial	$ 6,749,760							$ 2,560,000		$ 4,189,760	
28c	(Westside Arterial) Helmholtz Way-SW Wickiup to SW Elkhorn	Minor Arterial	$ 5,568,552							$ 2,112,000		$ 3,456,552	
9	SW Highland Avenue (Hwy 126) - widen to 5 lanes 35th to Rimrock (ODOT will not fund - Requires local funding to comply with TPR)	Major Arterial	$ 5,331,250						$ 6,600	$ 943,400		$ 4,381,250	
	Rimrock/OR 126 - southbound right turn lane + overlap, westbound right turn lane (in addition to two through lanes) including fill and retaining wall	Intersection	$ 1,250,000									$ 1,250,000	
26	(Westside Arterial) NW Maple Ave-NW 35th to Helmholtz (extra cut/fill $)	Minor Arterial	$ 3,593,040							$ 1,056,000		$ 2,537,040	
71	SW Veterans Way Modernization: Add center turn lane RxR to SE 1st Street.	Minor Arterial	$ 1,375,380						$ 26,000	$ 360,000	$ 334,000	$ 655,380	
	SW 15th/OR 126 - Restripe (no widening) for NB/SB left turn lanes and modify signal	Intersection	$ 50,000									$ 50,000	
	Lake Rd/OR 126 - NB RT lane	Intersection	$ 250,000									$ 250,000	
5	SE/SW Quartz Avenue extension from RxR to Airport Way	Major Collector	$ 2,105,000		$ 187,000					$ 991,800		$ 926,200	
	US 97/Quartz - Add WB LT lane	Intersection	$ 250,000									$ 250,000	
70b	SW Wickiup/SW Reservoir Drive Modernization: 39th to Helmholtz	Major Collector	$ 2,046,000							$ 880,000	$ 880,000	$ 286,000	
	NW 10th/Pershall - Add EB RT lane	Intersection	$ 250,000									$ 250,000	
MV Subtotal			*$ 40,953,658*	*$ -*	*$ 187,000*	*$ -*	*$ -*	*$ -*	*$ 32,600*	*$ 13,475,200*	*$ 2,504,375*	*$ 24,954,483*	*$ -*
Bikeway Projects													
56	Obsidian Avenue bike path construction from 23rd Street to Canyon Drive (4)	Major Collector / Trail	$ 140,399									$ 140,399	$ -
Bike Subtotal			*$ 140,399*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 140,399*	*$ -*
Pedestrian/Trails Projects (See Parks CIP for SDC Funding associated with Trail Construction)													
	North-South Canal Trail from SW Salmon Ave to SW Canal Blvd (near Greens Blvd)	Ped/Trail	$ 435,000								$ 178,350		
	North-South Canal Trail from existing trail (S of Antler) to existing trail (S of Canal) (Adjacent to SW 27th Street)	Ped/Trail	$ 960,000								$ 393,600		
	North-South Canal Trail from Existing (at Obsidian) to existing (at Yew)	Ped/Trail	$ 625,000								$ 256,250		
	SW Obsidian Ave Sidewalks SW Helmholtz Way to 31st St	Ped	$ 870,000								$ 870,000		
	NW Dogwood Ave from Canyon Dr to Canal Blvd	Ped	$ 315,000								$ 315,000		
	SW Obsidian Ave from SW 23rd St to SW Canal Blvd	Ped	$ 415,000								$ 415,000		
	ADA Enhancement	Ped	$ 250,000										
	SW Wickup Ave sidewalk construction of missing links SW 35th to Canal Blvd	Ped	$ 305,000								$ 305,000		
Ped/Trails Subtotal			*$ 4,175,000*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 2,733,200*	*$ -*	*$ -*
Transit Projects													
	Provide commuter service to Bend	*Transit*	*$ 500,000*										*$ 500,000*
Transit Subtotal			*$ 500,000*										*$ 500,000*
Total Phase 2			***$ 45,769,057***	***$ -***	***$ 187,000***	***$ -***	***$ -***	***$ -***	***$ 32,600***	***$ 13,475,200***	***$ 5,237,575***	***$ 25,094,882***	***$ 500,000***
Phase 3: 2021-2025													
Motor Vehicle Projects													
	TRANSPORTATION SYSTEM PLAN/CIP UPDATE											$ 200,000	
29	(Westside Arterial) Helmholtz Way-Elkhorn Ave to S Canal	Minor Arterial	$ 3,143,725							$ 1,700,000		$ 1,443,725	
21	(Westside Arterial) Pershall Way-3-lane widening from US 97 to Dry Canyon (E)	Minor Arterial	$ 2,219,100							$ 1,200,000		$ 1,019,100	
22	(Westside Arterial) Pershall Way-3-lane new section thru Dry Canyon (extra cut/fill $)	Minor Arterial	$ 3,088,680								$ 840,000	$ 2,248,680	
13	US 97/Quarry Ave Interchange	Intersection	$ 11,250,000				$ 1,687,500					$ 9,562,500	
30	(Westside Arterial - Outside UGB) Helmholtz Way-S Canal to Quarry	Minor Arterial	$ 4,430,500							$ -		$ 4,430,500	
17	SW 19th St - Extend to Deschutes Mkt Road as 2 lane collector (funded by Descutes County)	County Collector	$ 7,250,000										$ 7,250,000
18	Quarry Rd - Connect US 97 to 19th St Extension (Potential Initial Phase of Reroute II)	Minor Arterial	$ 2,728,000										$ 2,728,000

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	US 97/Vet Way - SB RT lane and 2nd EB LT	Intersection	$ 1,500,000									$ 1,500,000	
	US 97/Odem Medo - 2nd NB LT lane and 2nd west leg receiving lane	Intersection	$ 750,000		$ 750,000								
	US 97 Reroute/ Highland - Add single EB RT lane	Intersection	$ 250,000									$ 250,000	
	US 97 Reroute/ Evergreen - Add WB RT lane	Intersection	$ 250,000									$ 250,000	
6	SW Salmon Ave & Odem Medo Connector Project - S. Canal Blvd to 19th St.	Major Collector	$ 1,381,550								$ 280,000	$ 1,101,550	
52	Antler Avenue Modernization: Adjacent to undeveloped property - SW 35th to SE 17th	Major Collector	$ 1,610,000						$ 20,000	$ 644,000	$ 624,000	$ 322,000	
36	15th Street improvements from SW Quartz to SW Obsidian Avenue	Major Collector	$ 480,000							$ 192,000	$ 192,000	$ 288,000	
53	North Canal Boulevard reconstruction from Antler Avenue to US 97 Reroute	Major Collector	$ 2,695,000						$ 9,000		$ 2,147,000	$ 539,000	
60	SW Elkhorn Avenue: Helmholtz to S Canal Blvd	Major Collector	$ 1,736,000							$ 1,280,000		$ 456,000	
61	SW Quartz Avenue: Helmholtz to 41st Street	Major Collector	$ 542,500							$ 400,000		$ 142,500	
62	SW Obsidian Avenue: W UGB to 35th Street	Major Collector	$ 1,519,000							$ 1,120,000		$ 399,000	
63	W Antler Avenue: Helmholtz to 35th Street	Major Collector	$ 1,519,000							$ 1,120,000		$ 399,000	
64	NW 35th Street: NW Hemlock to NW Oak Avenue	Major Collector	$ 2,148,300							$ 528,000		$ 1,620,300	
65	NW Spruce Avenue: NW 22nd to NW 33rd	Major Collector	$ 1,432,200							$ 1,056,000		$ 376,200	
66	NW 10th Street: NW Upas to Perhall	Major Collector	$ 1,139,250							$ 840,000		$ 299,250	
67	NE 5th Street: NE Hemlock to E Antler Avenue	Minor Collector	$ 1,227,600							$ 528,000	$ 528,000	$ 171,600	
MV Subtotal			*$ 54,290,405*	*$ -*	*$ 750,000*	*$ -*	*$ 1,687,500*	*$ -*	*$ 29,000*	*$ 10,608,000*	*$ 4,611,000*	*$ 27,018,905*	*$ 9,978,000*
Bikeway Projects													
Bike Subtotal			*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*
Pedestrian/Trails Projects (See Parks CIP for SDC Funding associated with Trail Construction)													
	North-South Canal Trail from NE Maple Ave to Fireman's Pond Park	Ped/Trail	$ 835,000								$ 342,350		
	Dry Canyon Trail from NW Pershall Way to NW Upas Ave	Ped/Trail	$ 250,000								$ 102,500		
	East-West Canal Trail from NE Canal (@ Quince) to NE 5th St	Ped/Trail	$ 225,000								$ 92,250		
	SE/SW Airport Way from SE Veterans Way to SW 19th St	Ped	$ 2,435,000								$ 2,435,000		
	ADA Enhancement	Ped	$ 250,000										
Ped/Trails Subtotal			*$ 3,995,000*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 2,972,100*	*$ -*	*$ -*
Transit Projects													
	Provide commuter service to Bend	*Transit*	*$ 500,000*										*$ 500,000*
Transit Subtotal			*$ 500,000*										*$ 500,000*
Total Phase 3			***$ 58,785,405***	***$ -***	***$ 750,000***	***$ -***	***$ 1,687,500***	***$ -***	***$ 29,000***	***$ 10,608,000***	***$ 7,583,100***	***$ 27,018,905***	***$ 10,478,000***
Phase 4: 2026 to 2030													
Motor Vehicle Projects													
2005-1C	TRANSPORTATION SYSTEM PLAN/CIP UPDATE											$ 200,000	
14	NW Upas Ave overcrossing of US 97 (NW 10th to N Canal Blvd)	Major Collector	$ 3,938,080							$ 1,060,000		$ 2,878,080	
7	Elkhorn Ave extension from S Canal to TL 151329D01100 (Water Park), including overcrossing of US 97 and COID	Major Collector	$ 10,717,245							$ 1,920,000		$ 8,797,245	
20	NE 17th St - Eastside collector from OR 126 to Antler	Major Collector	$ 3,199,200							$ 1,920,000		$ 1,279,200	
69	S Canal Blvd: Badger to Helmholtz	Minor Arterial	$ 4,465,550							$ 2,680,000		$ 1,785,550	
33	NE/SE 9th Street improvements from Highway 126 to Hemlock Avenue	Minor Arterial	$ 2,730,000						$ 105,000	$ 382,200	$ 1,041,600	$ 1,201,200	
37	Forked Horn Butte Connection-Wickiup Ave to S. Canal Blvd.	Minor Collector	$ 2,650,500							$ 1,710,000	$ 570,000	$ 370,500	
54	Airport Way structural upgrade south of the airport	Major Collector	$ 1,670,000		$ 1,670,000								
55	Hemlock Avenue Modernization Project: Unimproved Segments	Major Collector	$ 2,600,000						$ 114,000	$ 1,040,000	$ 926,000	$ 520,000	
56	Obsidian Avenue Modernization/Street In-fill	Major Collector	$ 120,000							$ 96,000		$ 24,000	
58	NW 35th Street Modernization: Salmon to Hemlock	Major Collector	$ 1,795,000							$ 1,436,000		$ 359,000	
MV Subtotal			*$ 33,885,575*	*$ -*	*$ 1,670,000*	*$ -*	*$ -*	*$ -*	*$ 219,000*	*$ 12,244,200*	*$ 2,537,600*	*$ 17,414,775*	*$ -*
Bikeway Projects													
Bike Subtotal			*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*
Pedestrian/Trails Projects (See Parks CIP for SDC Funding associated with Trail Construction)													
	East-West Canal Trail from NE 5th St to East UGB	Ped/Trail	$ 100,000								$ 41,000		
	North-South Canal Trail from SW Helmholtz Way to SW Canal Blvd	Ped/Trail	$ 1,050,000								$ 430,500		
	ADA Enhancement	Ped	$ 250,000										
Ped/Trails Subtotal			*$ 1,400,000*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 471,500*	*$ -*	*$ -*
Transit Projects													
	Provide commuter service to Bend	*Transit*	*$ 500,000*										*$ 500,000*
Transit Subtotal			*$ 500,000*										*$ 500,000*
Total Phase 4			***$ 35,785,575***	***$ -***	***$ 1,670,000***	***$ -***	***$ -***	***$ -***	***$ 219,000***	***$ 12,244,200***	***$ 3,009,100***	***$ 17,414,775***	***$ 500,000***
When Warranted													
Street Projects													

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	Traffic Signal at Black Butte Boulevard and 5th Street (Highway 97)	Intersection	$ 250,000									$ 250,000	
	Traffic Signal at Kingwood Avenue and Highway 97.	Intersection	$ 455,000									$ 455,000	
	Traffic Signal at SE Veterans way and Highway 126.	Intersection	$ 250,000			$ 220,000						$ -	
	Traffic Signal at SW 35th and Highway 126.	Intersection	$ 250,000									$ 250,000	
	Traffic Signal at Obsidian Avenue and South Canal Boulevard.	Intersection	$ 250,000									$ 250,000	
	Traffic Signal at Quartz Avenue and South Canal Boulevard	Intersection	$ 250,000									$ 250,000	
	Traffic Signal at Odem Medo Road and South Canal Boulevard	Intersection	$ 250,000									$ 250,000	
	Roundabout: SW Airport Way/SW 19th Street	Intersection	$ 800,000		$ 800,000								
	King Way Rail Crossing Improvements (ODOT Rail to construct RxR gates/lights)	Intersection	$ 500,000								$ 100,000		$ 400,000
	Helmholtz Way/S Canal Blvd - Add a single lane roundabout	Intersection	$ 800,000									$ 800,000	
	NW 27th St/Antler - Add a traffic signal	Intersection	$ 250,000									$ 250,000	
	SW 27th St/S Canal Blvd - Add a single lane roundabout	Intersection	$ 800,000									$ 800,000	
	NW 19th St/Maple - Add a traffic signal	Intersection	$ 250,000									$ 250,000	
	NW 9th St/Maple - Add a traffic signal	Intersection	$ 250,000									$ 250,000	
	SE 9th St/Veterans Way - Add a signle lane roundabout	Intersection	$ 800,000									$ 800,000	
	Lake Rd/Veterans Way - Add a SB RT lane	Intersection	$ 250,000									$ 250,000	
	SW 27th/Obsidian - Add a traffic signal when warranted	Intersection	$ 250,000									$ 250,000	
	SW 27th/Salmon - Add a traffic signal when warranted	Intersection	$ 250,000									$ 250,000	
	SW 27th/Wickiup - Add a traffic signal when warranted	Intersection	$ 250,000									$ 250,000	
	NE 9th/Hemlock - Add a traffic signal when warranted	Intersection	$ 250,000									$ 250,000	
	NE 9th/E Antler - Add a traffic signal when warranted	Intersection	$ 250,000									$ 250,000	
	NW 35th/Maple - Add a traffic signal when warranted	Intersection	$ 250,000									$ 250,000	
	SW Helmholtz/Wickiup - Add a traffic signal when warranted	Intersection	$ 250,000									$ 250,000	
	NW 27th/Hemlock - Add a traffic signal when warranted	Intersection	$ 250,000									$ 250,000	
	Airport Way Interchange at US 97 Reroute, Phase II	Intersection	$ 6,450,000		$ 6,450,000							$ -	
	Ped Crossing Enhancement: Helmholtz Way (approx 35 locations from Maple to Wickiup)	Ped	$ 350,000								$ 350,000		
	Ped Crossing Enhancement: US 97 (approx 27 locations from US 97 Reroute to South UGB)	Ped	$ 270,000								$ 270,000		
	Ped Crossing Enhancement: OR 126 (approx 17 locations from West UGB to SW 15th St)	Ped	$ 170,000								$ 170,000		
	Ped Crossing Enhancement: OR 126 (approx 17 locations from SE Lake to East UGB)	Ped	$ 170,000								$ 170,000		
Total When Warranted			**$ 16,065,000**	**$ -**	**$ 7,250,000**	**$ 220,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,060,000**	**$ 7,105,000**	**$ 400,000**
Financially Constrained Projects													
	US 97 Reroute, Phase II	ODOT Expressway	$ 226,140,000	$ 226,140,000									
10	Hwy 126 - widen to 3 lanes from US 97 Reroute to Veterans Way (three lane sections proposed at SE 9th Street and exisitng at SE Veterans Way)	Major Arterial	$ -	$ -									
19	O'Neill Ave - Grade separated crossing of US 97	Intersection	$ 7,430,848	$ 7,430,848									
Total Financially Constrained Projects			**$ 233,570,848**	**$ 233,570,848**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Subtotal Phase 1			$ 55,421,574	$ -	$ -	$ -	$ -	$ -	$ 184,000	$ 9,969,800	$ 12,976,700	$ 28,782,774	$ 1,550,000
Subtotal Phase 2			$ 45,769,057	$ -	$ 187,000	$ -	$ -	$ -	$ 32,600	$ 13,475,200	$ 5,237,575	$ 25,094,882	$ 500,000
Subtotal Phase 3			$ 58,785,405	$ -	$ 750,000	$ -	$ 1,687,500	$ -	$ 29,000	$ 10,608,000	$ 7,583,100	$ 27,018,905	$ 10,478,000
Subtotal Phase 4			$ 35,785,575	$ -	$ 1,670,000	$ -	$ -	$ -	$ 219,000	$ 12,244,200	$ 3,009,100	$ 17,414,775	$ 500,000
Subtotal When Warranted			$ 16,065,000	$ -	$ 7,250,000	$ 220,000	$ -	$ -	$ -	$ -	$ 1,060,000	$ 7,105,000	$ 400,000
Subtotal Financially Constrained			$ 233,570,848	$ 233,570,848	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL - All Projects			**$ 445,397,459**	**$ 233,570,848**	**$ 9,857,000**	**$ 220,000**	**$ 1,687,500**	**$ -**	**$ 464,600**	**$ 46,297,200**	**$ 29,866,475**	**$ 105,416,336**	**$ 13,428,000**

SDC TOTALS:	**$ 105,416,336**
Existing SDC Reserve:	**$ 6,200,000**
NEW SDC FUNDING REQUIREMENT:	**$ 99,216,336**
# New Peak Hour Trips at Buildout:	**21,200**
SDC per PM Peak Hour Trip:	**$4,680**

Transportation Funding Source	Estimated Revenue ($1,000)

** Assumes utility fee corresponding to $40 per capita per year (a typical single family household may be charged approximately $6 per month)

SECTION 5-3: TRANSPORTATION SDC TECHNICAL MEMORANDA

FCS GROUP
Solutions-Oriented Consulting

Memorandum

To: Chris Doty, City of Redmond **Date:** February 1, 2008

From: John Ghilarducci
Michael Dean

CC: Carl Springer, DKS Associates

RE Technical Memorandum #1 – Key Transportation SDC Policy Issues

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As part of the City's currently ongoing transportation system plan update, FCS GROUP was contracted to develop a transportation system development charge (SDC) policy framework. Specifically, it was agreed that the "consultant shall identify key policy questions to be addressed in the study and prepare an issue paper (Technical Memorandum #1) analyzing each policy question (up to 6), and suggesting a preliminary course of action." Key policy questions were identified and discussed in a meeting with City staff in late November. This technical memorandum summarizes our analysis and recommendations on the following topics:

- Trip forecasting techniques and their relationship to the SDC calculation,
- The effect of trip-length factors on commercial and industrial SDCs,
- The impact of allocating project costs among customer types by road type, and
- Mitigating SDC impacts on affordable housing and downtown re-development.

We have attempted to limit our discussion and recommendations to our perspective as financial and management consultants, and not transportation engineers or planners. On those issues in which our comments touch on engineering or planning, we defer to the more applicable expertise of City staff and DKS Associates.

1. Trip Forecasting Techniques: Local Modeling Versus ITE Trip Estimates

Trip growth forecasts, as the denominator in most transportation SDC calculations, are very important to the SDC analysis. In fact, the trip growth forecast is also a crucial component of a transportation system plans. Required improvements, project costs, funding sources, and construction timelines all follow from the number of vehicle trips that a jurisdiction and its roadways must serve.

There are essentially two sources for trip generation estimates: the Institute of Transportation Engineers (ITE) *Trip Generation*, a manual that provides trip generation estimates by land use for hundreds of different land uses; and local traffic

models. ITE trip rates are based on over 4,250 actual traffic studies conducted nationwide, and trip rates for hundreds of types of land uses are reported. The ITE Trip Generation manual is the industry standard due to this comprehensive collection of development types and site-specific traffic studies. Importantly for SDC purposes, the ITE manual is almost universally used to forecast the individual trip generation of a new development, and the resulting charge.

Nevertheless, there are limitations to the ITE trip rates, and these can be found within the ITE's own data. For each published trip estimate – determined by a weighted average of all available traffic studies for each land use – the ITE Trip Generation manual reports the lowest and highest reported trip rate. These lowest and highest reported rates indicate that there is much variability around the average for each land use. For example, of the 302 traffic studies conducted on singe-family homes, the weighted average trip rate was 1.01 peak-hour trips per home. However, the smallest reported trip rate was 0.42 peak-hour trips (58% lower than the published average), and the highest reported trip rate was 2.98 peak-hour trips (almost three times higher than the published average). Results are similar for other land uses that report more than one survey.

Theses results indicate that, depending on the specific circumstances, the ITE estimates may be acceptably close to actual traffic demand (for developments with "typical" traffic generation) or quite different from actual conditions (for developments with atypical traffic patterns) for individual developments. That is frankly why it is important to offer an appeal process, as the City of Redmond does, that allows new developments to demonstrate that their site-specific trip generation will differ from ITE estimates. Generally, this effect would be minimized by using ITE data to forecast system-wide trip generation.

Local traffic modeling is the alternative approach to trip forecasting. In this case, the Traffic Planning Analysis Unit (TPAU) of the Oregon Department of Transportation developed a traffic model that incorporated the City of Redmond's local transportation characteristics. Specifically, the traffic model utilizes verified trip counts that apply to and are based on the configuration of developments within the City. As the data shows, incorporating local trip rates and development patterns allows a local traffic model to perhaps improve upon the nationwide averages provided by the ITE manual.

According to preliminary estimates from the traffic model, the City is expected to experience an increase of 18,360 P.M. peak-hour trip ends during the study period. Alternatively, if ITE trip estimates were relied upon, projected growth in peak-hour trip ends for the City are projected to be 21,200, or 15.5% more than predicted by the local transportation model. While this difference may prove acceptable for roadway planning purposes, dividing by the lower number will result in an SDC that is 15.5% higher than dividing by the higher number (the ITE estimate). This is particularly important because the charges are applied to individual developing properties by using the ITE manual. Dividing by the traffic model result and then applying the charge using the ITE

manual may create an internal inconsistency in this case, and should result in an over-collection of revenue.

The only way to create internal consistency in an approach that uses the traffic modeled trip result in the calculation would theoretically be to calculate each individual charge based on site-specific trip estimates based on local trip data / counts. Such studies are costly and time-consuming, essentially rendering their universal use infeasible.

We recommend that the City use the ITE-generated trip forecast in the SDC calculation, continue to apply the ITE manual to derive individual charges, and provide an appeal process that allows for new development to demonstrate its differences from the ITE estimates.

2. Effect of Trip-Length Factors on Commercial and Industrial SDCs

Some jurisdictions apply transportation SDCs that incorporate vehicle miles traveled. In these cases, the estimated trip generation rate applied to a development, for assessment purposes, is adjusted by the average length of those trips – as compared to the average length of all trips systemwide. The reasoning is that even if two given types of land use both generate the same number of trips, if the average trip length associated with one development is twice as long as the average trip length for the second development, the land use with the longer trip length uses more of the transportation system and it should therefore pay a higher transportation charge.

Our research found average trip lengths for 45 common land uses, based on a several traffic studies conducted nationwide. For each land use, an average trip length factor was provided, as determined by that development's average trip length and the systemwide average trip length of 7.3 miles. Excluding residential land uses, the average trip factor of the remaining 38 land uses was 0.684, with a maximum trip length factor of 1.37 (industrial and manufacturing land uses) and a minimum of 0.26 (gas station). The full list of available trip length factors for non-residential land uses is shown following.

Land Use Code and Title	Trip Length Factor
110 - General Light Industrial	1.37
130 - Industrial Park	1.37
140 - Manufacturing	1.37
151 - Mini-Warehouse	0.54
493 - Athletic Club	0.85
520 - Elementary School	0.66
522 - Middle School	0.66
530 - High School	0.66
540 - Junior/Community College	1.06
560 - Church	0.68
565 - Day Care	0.68
590 - Library	0.57
710 - General Office	0.89
715 - Single Tenant Office Building	0.89
720 - Medical-Dental Office	0.89
750 - Office Park	0.89
760 - Research & Development Center	0.89
770 - Business Park	0.89
812 - Building Materials & Lumber	0.49
813 - Discount Super Store	0.38
814 - Specialty Retail	0.59
815 - Discount Store	0.38
816 - Hardware/Paint Store	0.49
817 - Nursery/Garden Center	1.06
820 - Shopping Center	0.38
841 - New Car Sales	0.81
848 - Tire Store	0.63
850 - Supermarket	0.37
851 - Convenience Market	0.37
880 - Pharmacy w/o drive through	0.37
881 - Pharmacy w/ drive through	0.37
890 - Furniture Store	1.06
911 - Walk-In Bank	0.42
912 - Drive-In Bank	0.42
931 - Quality Restaurant	0.54
932 - High Turnover Sit-Down Rest.	0.52
934 - Fast Food With Drive-Thru	0.28
944 - Gas Station	0.26

We recommend foregoing a trip-length factor at this time. The City, although growing, may not be large enough to warrant the SDC differentials that would result from the use of these factors at this time.

3. Impact of Allocating Roadway Costs Between Customer Types

Similar to the utilization of average trip length factors, another approach to differentiating transportation impacts beyond simple trip generation is to allocate roadway costs to broad customer classes by roadway type.

For example, in its development of a transportation utility fee structure, the City of Oregon City assigned all roadways into one of four categories: Collector, Residential / Local, Arterial, and Other. The City determined that residential customers would bear 100% of the burden of maintaining residential / local and "other" streets, 50% of the burden of maintaining collector streets, and none of the burden of maintaining arterial streets.

If the City of Redmond adopted this approach, it could apply residential allocations, similar to those above, to transportation improvements on the City's SDC project list. SDC-eligible improvement costs would then be classified as residential or non-residential, and each cost would be recovered from its corresponding customer/development type.

In the case of Oregon City, the above residential allocations were applied to original construction costs for each roadway type. As a result, about 75% of the annual revenue needs of the City's newly formed transportation maintenance utility were designated for recovery from residential customers. If a similar residential allocation was found to occur in Redmond, and residential and non-residential trip growth was expected to be similar, transportation SDCs for non-residential developments would be reduced 50% while residential SDCs would increase by 50%.

It should be noted that many commercial and industrial SDCs would be reduced by a simple update of the trip factors assigned to new development. Since the City's current SDC was developed, pass-by trip rates for many developments have been revised. As the table below shows, for the most part, pass-by trip factors have increased, resulting in lower transportation charges for several types of land use.

Land Use Code and Title	Current Pass-By Factor	Revised Pass-By Factor	% SDC Discount
565 - Day Care	0%	67%	(67%)
812 - Building Materials & Lumber	20%	0%	+ 20%
814 - Specialty Retail	34%	0%	+ 34%
815 - Discount Store	18%	52%	(34%)
816 - Hardware/Paint Store	20%	55%	(35%)
817 - Nursery/Garden Center	20%	0%	+ 20%
820 - Shopping Center	34%	61%	(27%)
841 - New Car Sales	20%	0%	+ 20%
848 - Tire Store	28%	0%	+ 28%
850 - Supermarket	36%	74%	(38%)
851 - Convenience Market	61%	72%	(11%)
880 - Pharmacy w/o drive through	53%	67%	(14%)
881 - Pharmacy w/ drive through	49%	62%	(13%)
890 - Furniture Store	53%	84%	(31%)
911 - Walk-In Bank	47%	73%	(26%)
912 - Drive-In Bank	47%	73%	(26%)
931 - Quality Restaurant	44%	71%	(27%)
932 - High Turnover Sit-Down Rest.	43%	68%	(25%)
933 - Fast Food w/o Drive-Thru	50%	73%	(23%)
934 - Fast Food With Drive-Thru	50%	73%	(23%)
944 - Gas Station	42%	77%	(35%)
945 - Gas/Service Station with Convenience Market	62%	88%	(26%)
947 - Self-Service Car Wash	33%	0%	+ 33%
	Max % Decrease:		**-67%**
	Max % Increase:		**34%**
	Avg % Change:		**-14%**

4. Affordable Housing and Downtown Re-development

One area of system development charges that is gaining interest is the evaluation of discounts on transportation SDCs for downtown development. Since the City is expecting commercial re-development and affordable residential development in the downtown area, it became interested in opportunities to equitably and defensibly minimize the SDC burden on these developments.

The following related policies already exist in City SDC code:

> Per section 4.730 of the City's municipal code, commercial re-development will not need to pay a transportation SDC unless the re-development results in an increased number of trips than previously generated by the property.
>
> Per section 4.735 of the City's code, if a commercial re-development will result in greater trip generation than the previous land use, the

transportation SDC will only be assessed to the incremental change in trips.

Per section 4.718 of the City's Code, pre-certified and qualified business firms within the Redmond Enterprise Zone receive a 1% SDC discount for each full-time job that is created (up to a maximum of a 25% SDC discount).

Three options for meeting this objective are outlined below.

1. For the purposes of calculating transportation SDCs, almost all commercial development in the downtown core could be classified under the ITE "Shopping Center" land use, due to the concentrated nature of downtown commercial development. This would be an alternative to the current approach of assessing the SDC based on each development's specific type of land use, which does not account for the fact that visitors need to park only once to accomplish more than one downtown task.

   In the ITE Trip Generation manual the shopping center designation is assigned a peak-hour trip rate of 3.75 per 1,000 square feet of leasable space. For some land uses, this trip rate would result in a significantly reduced SDC. For example, a high turnover sit-down restaurant would be assigned a peak-hour trip rate of 10.92 per 1,000 square feet (a 66% decrease), and a drive-in bank would be assigned a peak-hour trip rate of 45.74 per 1,000 square feet (a 92% decrease). Furthermore, traffic studies reported by the ITE allow for an additional 61% adjustment (reduction) in trip generation for pass-by trips to be applied to shopping centers.

2. Discount transportation SDCs for certain types of residential downtown developments, to reflect that the density of development and the increased availability of transit options downtown result in lower trip generation rates. Although residential developments cannot benefit from the Shopping Center classification, downtown development densities also have an effect on residential trip generation. The best information we are aware of indicates that a combination of urban development and transit availability can reduce residential vehicle trips between six and fifteen percent.

3. Account for the location of planned capital improvements in area-specific charges. If capital improvements are disproportionately planned for outside of the downtown core, this could result in lower improvement fees inside of the core.

   The first step in evaluating this approach is to review the transportation project list and determine if a split can be made between planned improvements that will serve inside and outside the downtown core. For example, it may be determined that an area-specific approach to assigning capital improvement

costs would not be appropriate due to the fact that all improvements have been sized to meet system-wide trip growth. In that case, transportation improvement costs could not be defensibly allocated to separate geographic areas. For such an allocation to be equitable, there must be a documented link between trip growth generated by downtown development and the improved roadway capacity such development utilizes Citywide.

Additionally, after fully accounting for all improvement costs that will serve downtown development, a reduced transportation SDC for the downtown area is highly dependent on growth/re-development in the downtown area. If such growth is expected to be minimal, an area-specific transportation charge could result in a downtown transportation SDC that is higher than the current Citywide system development charge.

FCS GROUP
Solutions-Oriented Consulting

Memorandum

To: Chris Doty, City of Redmond **Date:** March 7, 2008

From: John Ghilarducci
Michael Dean

CC: Carl Springer, DKS Associates

RE Technical Memorandum #2 – SDC Analysis

As part of the City's currently ongoing transportation system plan update, FCS GROUP was contracted to review and calculate alternatives for the City's transportation system development charge (SDC). The following is a summary of the SDC methodology used to update the City's transportation SDC. This memo also provides a preliminary transportation SDC for the City's consideration.

1. SDC Cost Bases

A system development charge consists of a reimbursement fee, an improvement fee, or both. Currently, the City's transportation SDC is composed of solely an improvement fee.

We recommend that the City consider incorporating a reimbursement fee into its transportation SDC. Adopting a charge with a reimbursement fee component will give the City greater flexibility in funding its planned capital improvements due to the fact that the State Statute governing SDCs (ORS 223.297 - 223.314) allows reimbursement fee proceeds to be spent on any capital improvements related to the systems for which the SDC applied, while the expenditure of improvement fee proceeds is limited to the capacity-increasing cost portion of capital improvements.

Reimbursement Fee

Per Statute, the reimbursement fee component of the SDC must be based on "the value of unused capacity available to future system users or the cost of the existing facilities", and must further consider prior contributions by existing users and gifted and grant-funded facilities. The allocation of existing facilities costs must also "promote the objective of future system users contributing no more than an equitable share to the cost of existing facilities."

Construction of the City's existing transportation system has been funded largely from contributions, general tax sources such as property taxes and state gas taxes, and previously paid SDCs. Contributed assets clearly may not be included in the fee basis.

Regarding general tax sources, the owner of a developing property can effectively argue that they have already paid for a share of the existing system through the taxes they have paid over time.

Conversely, a strong argument can be made that the cost of assets funded by previously paid SDC improvement fees provides a valid reimbursement fee cost basis. If the previously paid charges have funded facilities that still have unused capacity available for growth, then the cost of that capacity may be included in the cost basis for new customers to pay for a full share of the capacity that will serve them.

Therefore, for the reimbursement fee cost basis, we recommend that the City include only the cost of unused capacity in facilities funded by previously paid improvement fees. The City reported $14,016,177 of historical transportation SDC (improvement fee only) expenditures from FY 2001 through FY 2007. Current unused capacity was estimated by reducing the SDC expenditure total for each year proportionally by the peak-hour trip growth that had occurred since that year, as derived from the 2000-2030 trip forecast. The resulting total of unused capacity in the existing system was $13,047,206.

Improvement Fee

The improvement fee component of the SDC is based on the cost of planned future facilities. By State Statute, included costs may be based on only projected capital improvements that are needed to increase system capacity for future users. In other words, the costs of planned projects that correct existing deficiencies, or do not otherwise increase capacity for future users, may not be included in the improvement fee calculation.

The February 2008 draft of the City's Transportation System Plan Update provided a list of needed capital projects. The sum of this list of project costs in current dollars was $448,667,759, of which $105,416,336 was identified as improvement-fee eligible and growth-related costs after accounting for participation from the Oregon Department of Transportation (ODOT) and other internal and external funding sources. To determine this improvement fee eligible portion of the City's share of the project list, City staff and the project engineer performed a project-by-project allocation between existing needs and growth. The result of these growth allocations was the initial improvement fee cost basis of $105,416,336.

Finally, the current improvement fee fund balance, $6,200,000, was deducted to (1) recognize that the fund balance is available for spending on the project list and (2) prevent new users from paying for those project costs twice. The resulting net total of $99,216,336 was the improvement fee cost basis.

2. SDC Capacity Bases

The February 2008 draft of the City's Transportation System Plan Update reported estimated vehicle trip growth of 21,200 peak-hour trips over the planning period (2008

to 2030). This became the denominator in both the reimbursement and improvement fee calculations.

3. SDC Rates

The recommended transportation SDC of $5,300 per peak-hour trip is the sum of the reimbursement fee and the improvement fee, adjusted by an administrative cost recovery factor of 0.09%. The components of this calculation are described below:

- The reimbursement fee was calculated as the reimbursement fee cost basis, $13,047,206, divided by forecasted growth in peak-hour trips, 21,200. The result of this calculation was a base reimbursement fee of $615.43 per peak-hour trip.

- The improvement fee was calculated based on an improvement fee cost basis of $99,216,336 divided by the total forecasted growth in peak-hour trips, 21,200, which resulted in a base improvement fee of $4,680.02 per peak-hour trip.

- The administrative cost recovery factor of 0.09% was derived by dividing the amortized cost of this study, $20,980, by forecasted annual SDC revenues over the study period. The administrative cost recovery factor should also incorporate the City's estimated costs of "providing an annual accounting of system development charge expenditures" and revenues.

FCS GROUP
Solutions-Oriented Consulting

Memorandum

To: Chris Doty, City of Redmond **Date:** March 7, 2008

From: John Ghilarducci
Michael Dean

CC: Carl Springer, DKS Associates

RE Technical Memorandum #3 – Findings and Recommendations

As part of the City's currently ongoing transportation system plan update, FCS GROUP was contracted to review and calculate alternatives for the City's transportation system development charge (SDC). The following is a summary of Task 8 findings and recommendations.

1. Policy Recommendations

Trip Forecasting Techniques: Local Modeling Versus ITE Trip Estimates

Trip growth forecasts, as the denominator in most transportation SDC calculations, are very important to the SDC analysis. There are essentially two sources for trip generation estimates: the Institute of Transportation Engineers (ITE) Trip Generation, a manual that provides trip generation estimates by land use for hundreds of different land uses; and local traffic models.

ITE trip rates are based on over 4,250 actual traffic studies conducted nationwide, and trip rates for hundreds of types of land uses are reported. Due to the significant amount of variation that is inherent in such traffic counts, any given ITE trip estimate may be acceptably close to actual traffic demand (for developments with "typical" traffic generation) or quite different from actual conditions (for developments with atypical traffic patterns) for individual developments.

Local traffic modeling is the alternative approach to trip forecasting. In this case, the Traffic Planning Analysis Unit (TPAU) of the Oregon Department of Transportation developed a traffic model that incorporated the City of Redmond's local transportation characteristics. Specifically, the traffic model utilizes verified trip counts that apply to and are based on the configuration of developments within the City. Incorporating local trip rates and development patterns allows a local traffic model to perhaps improve upon the nationwide averages provided by the ITE manual. However, the transportation SDC will be assessed based on ITE trip estimates. If the calculation of the City's SDC were based on the trip growth projected by the local traffic model, the City would need to calculate each new development's transportation SDC by conducting site-specific trip

estimates based on local trip data / counts. This would be a costly and time-consuming process.

Therefore, we recommend that the City use the ITE-generated trip forecast in the SDC calculation, continue to apply the ITE manual to derive individual charges, and provide an appeal process that allows for new development to demonstrate its differences from the ITE estimates.

Effect of Trip-Length Factors on Commercial and Industrial SDCs

Some jurisdictions apply transportation SDCs that incorporate vehicle miles traveled. In these cases, the estimated trip generation rate applied to a development, for assessment purposes, is adjusted by the average length of those trips – as compared to the average length of all trips systemwide. Our recommendation is that the City forego a trip-length factor at this time. Although growing, the City may not be large enough to warrant the SDC differentials that would result from the use of these factors at this time.

Impact of Allocating Roadway Costs Between Customer Types

Similar to the utilization of average trip length factors, another approach to differentiating transportation impacts beyond simple trip generation is to allocate roadway costs to broad customer classes by roadway type.

For example, in its development of a transportation utility fee structure, the City of Oregon City assigned all roadways into one of four categories: Collector, Residential / Local, Arterial, and Other. The City determined that residential customers would bear 100% of the burden of maintaining residential / local and "other" streets, 50% of the burden of maintaining collector streets, and none of the burden of maintaining arterial streets. If the City of Redmond's roadways were found to serve residences to the same extent as those in Oregon City, transportation SDCs for non-residential developments could be reduced 50% while residential SDCs could increase by 50%. While it considers this policy, the City should note that many commercial and industrial SDCs would be reduced by a simple update of the trip factors assigned to new development.

Affordable Housing and Downtown Re-development

One area of system development charges that is gaining interest is the evaluation of discounts on transportation SDCs for downtown development. Since the City is expecting commercial re-development and affordable residential development in the downtown area, it became interested in opportunities to equitably and defensibly minimize the SDC burden on these developments.

In addition to sections of the City's SDC code that already encourage commercial re-development within the City, we reviewed other options to minimize the burden on commercial re-development and affordable residential developments downtown.

First, we noted that, for the purposes of calculating transportation SDCs, almost all commercial development in the downtown core could be classified under the ITE "Shopping Center" land use, due to the concentrated nature of downtown commercial development. This would be an alternative to the current approach of assessing the SDC based on each development's specific type of land use, which does not account for the fact that visitors need to park only once to accomplish more than one downtown task.

Second, the City could discount transportation SDCs for certain types of residential downtown developments to reflect that the density of development and the increased availability of transit options downtown result in lower trip generation rates. The best information we are aware of indicates that a combination of urban development and transit availability can reduce residential vehicle trips between six and fifteen percent.

And third, the City could choose to adopt area-specific transportation charges. If planned capital improvements are disproportionately planned for outside of the downtown core, this could result in lower improvement fees inside of the core.

2. SDC Recommendations

We recommended that the City adopt an updated transportation SDC that included both a reimbursement fee and an improvement fee component. Based on historical improvement fee expenditures and estimated trip growth to date, we recommended a transportation reimbursement fee of $615.43 per peak-hour trip.

Based on planned transportation improvement costs identified in the City's updated Transportation System Plan, we recommended that the City adopt an updated transportation improvement fee of $4,680.02 per peak-hour trip. This reflects a proportional allocation to growth of all transportation improvements that increase system capacity.

Finally, based on the amortized cost of this SDC study, we recommended that the City adopt an administrative cost recovery fee of $4.75 per peak-hour trip. The result was a total transportation SDC of $5,300 per peak-hour trip. Should the City decide to adopt a transportation SDC that is less than the supportable charge, we recommend that it adopt the full calculated reimbursement fee and reduce the improvement fee as needed. This approach will provide the City with additional flexibility for spending SDC proceeds on the portion of project costs that do not add capacity for growth.

SECTION 6: WATER

The elements of the Water Section include as follows:

1. Executive Summary from the Water Master Plan
2. Capital Improvement Plan
3. CIP Maps
4. SDC Analysis

SECTION 6-1: WATER MASTER PLAN EXECUTIVE SUMMARY

Water Master Plan Executive Summary

Introduction

The City of Redmond owns and operates the wastewater and water utilities serving the city's residents. This master plan report presents plans for improving and expanding the water system and for the collection portion of the wastewater system. It recommends capital improvements to guide expansion of these systems to meet the needs when urban growth boundary (UGB) buildout occurs, which is expected in 2030. The plans also present conceptual approaches for addressing the needs to the limits of the Urban Reserve Area (URA).

The last master plan updates for these systems were completed in 2000. At that time, the city served a population of 13,700 and anticipated a buildout UGB population of 36,000 in 2020. As of July 2006, the city served a population of 23,500. The UGB buildout population was revised in 2007 to 58,000 in 2030. The city added approximately 2300 acres to the UGB in 2006 and created the URA totaling 5,600 acres.

Water Plan

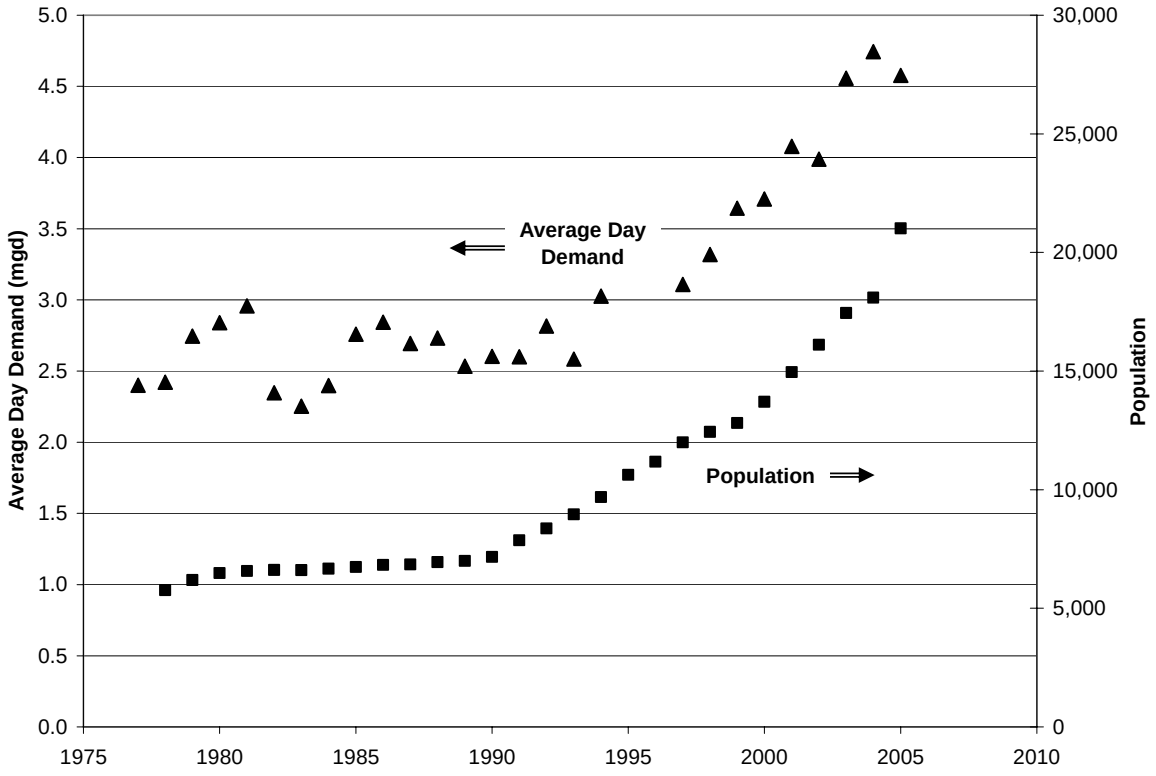
The city's water system is classified as a public, community system, and is subject to regulation under the federal Safe Drinking Water Act Amendments and Oregon's rules for public water systems. It has been assigned the state and federal Public Water System Identification No. 4100693.

Water Use

After remaining nearly unchanged from the late 1970s through 1993, water use in Redmond began to increase rapidly in the mid-1990s, corresponding to a period of rapid population growth. Exhibit ES-1 illustrates the significant growth in both population and water use since that time. As of 2007, the annual average demand was slightly less than 5 mgd. The highest single day (maximum day demand), which occurred during the summer irrigation season, was approximately 11 mgd for 2007.

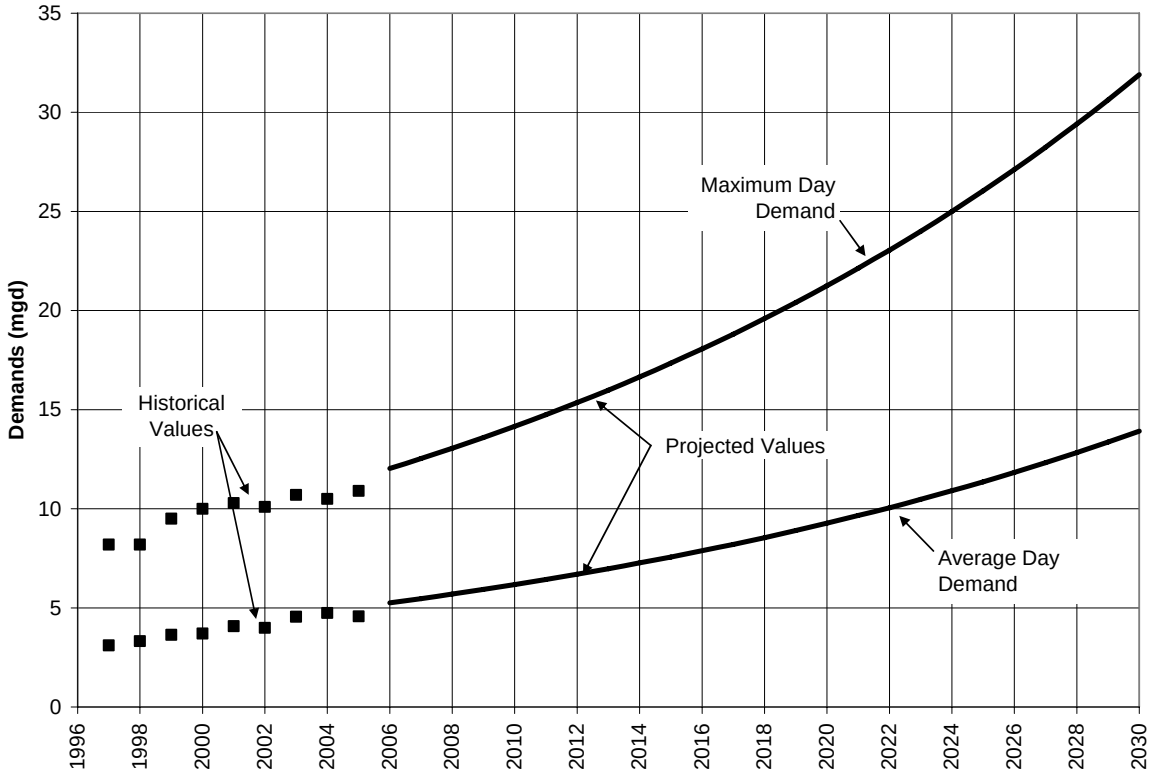
On a per capita basis, the average use was approximately 240 gpcd. During the peak summertime period, the per capita use was 550 gpcd. These per capita values represent the total system demand, whether for residential, commercial, industrial, or governmental use, divided by the service population.

EXHIBIT ES-1
Average Day Demand Records for 1977-2005
Redmond Wastewater (Collection System) and Water System Master Plan



The water demands in Redmond are expected to nearly triple from 2005 to 2030. The average day demand (ADD) is projected to increase from 5.0 mgd in 2005 to 14 mgd in 2030. The maximum day demand (MDD) is projected to increase from 11.6 mgd in 2005 to 32 mgd in 2030. Exhibit ES-2 illustrates the average and maximum day projections to 2030.

EXHIBIT ES-2
Redmond Demand Projections
Redmond Wastewater (Collection System) and Water System Master Plan



Regulatory Review

Community water systems are governed by rules developed by the U.S. Environmental Protection Agency (EPA) for implementation of the Safe Drinking Water Act Amendments. Oregon, as a primacy state, is required to implement water quality regulations at least as stringent as EPA's rules. For the most part, Oregon has adopted identical regulations to those at the federal level. Additional Oregon rules are highlighted in the regulatory section of this report.

Redmond's water system complies with all state and federal rules. The federal government recently adopted the Groundwater Rule. The requirements of this rule become fully effective by 2014. It is possible, but unlikely, that this rule would force the city to add treatment for the wells.

Water Supply Status and Protection

Before 1988, the City of Redmond obtained drinking water from a combination of surface water and groundwater sources. In 1988, the city converted its system to obtain 100 percent of its drinking water supply from groundwater wells completed hundreds of feet deep.

The city's groundwater supply is composed of six production wells, with a seventh to begin operation in 2008. The wells range in depth from 330 to 860 feet below ground surface in a highly permeable volcanic and sedimentary sequence known as the Deschutes Formation. The surface facilities at each well location consist of a pump house that encloses the automated controls, mechanical systems, and chlorination systems. The chlorination

systems are housed in separate rooms containing 150-pound gas cylinders. In normal operations, wells are cycled on and off to meet system demands.

The existing wells provide an excellent long-term public water supply. The aquifer that provides groundwater to the city's wells is large in areal extent and is highly permeable. Annual recharge to the aquifer is high and measurements of long-term water level trends show no apparent declines in groundwater levels that would suggest water is being over-appropriated. Additionally, the quality of water is excellent. However, the following management actions are recommended to help protect both the quantity and quality of this valuable water supply:

- Develop and implement a drinking water protection plan to reduce the potential for contamination of the groundwater supply.
- Implement a water level monitoring program at non-pumping wells in the Redmond vicinity to track long-term groundwater level trends.

Expansion of the City's Water Supply

The city plans to add wells as needed to meet projected growing demands. This is illustrated in Exhibit ES-3, which displays both firm and total well production capacity compared to the projected MDD. Firm capacity represents the total capacity minus the production from the largest well. It is recommended that the city use firm capacity as the basis for planning new additions, as shown on this chart, because it is reasonable to expect that one well may be off-line for extended periods for mechanical repairs or other reasons.

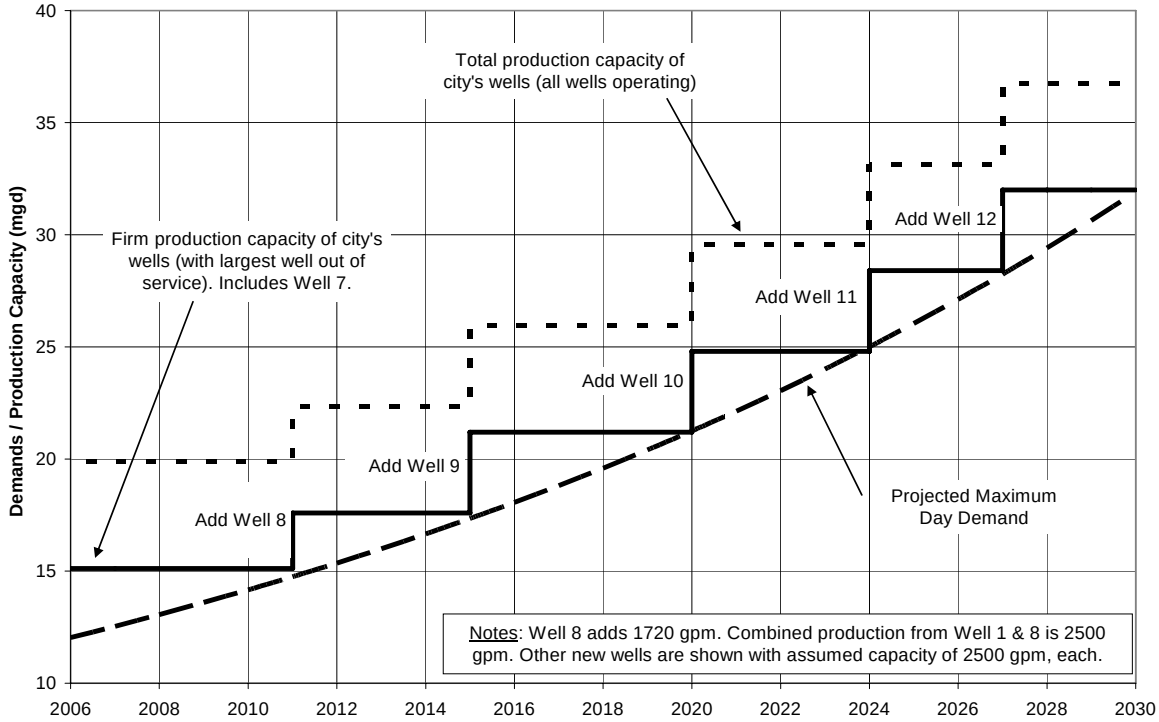
Water Rights

Under currently held municipal use groundwater permits and certificates, the city is authorized to appropriate 12.8 mgd. A comparison of the capacity of Wells 1–7 (a total of 19.4 mgd and a firm capacity of 15.1 mgd) to the amount of water authorized under existing municipal use groundwater rights (12.8 mgd) indicates that the city is limited by water rights and not well production capacity. The city has taken steps to address this by submitting new municipal use groundwater permit applications.

The city's existing municipal use groundwater permits and certificates vary in priority date from September 5, 1969, to November 25, 1991. None of these existing rights are subject to the Oregon Water Resources Department's (OWRD's) mitigation requirements in the Deschutes Basin. The most junior (that is, the newest) of these permits (permit G-12401, priority date November 25, 1991) does contain a condition that may allow OWRD to regulate the use in favor of the Deschutes River State Scenic Waterway flows. However, this condition (which is in several permits in the basin) has not been implemented by OWRD to date.

The greatest protection afforded by Oregon water law lies in obtaining water right certificates, which lock in the city's place in the water appropriation line and its privileges as a municipal water provider. Therefore, all water right processes should be diligently tracked and completed by the city to ensure the protection of its existing water rights.

EXHIBIT ES-3
Well Capacity Chart



The city's 2007 MDD is nearing its current groundwater water rights capacity of 12.8 mgd. In anticipation of the need for additional water rights capacity, in January 1999 the city submitted a new water rights application for the use of 25 cubic feet per second (cfs) (16.2 mgd). Given the stable and sustainable aquifer in the Redmond area, developing additional wells to maximize the use proposed under G-14908 should be feasible. Application G-14908 is currently under review by OWRD, with permit issuance to likely occur in 2008. When approved, Application G-14908, in combination with the city's existing permits and certificates, will provide the city with 29 mgd of water rights capacity, sufficient to meet projected MDD beyond the year 2030.

Application G-14908 is subject to OWRD's Deschutes Basin Groundwater Mitigation rules, which means that prior to permit issuance the city will need to provide mitigation to offset potential groundwater pumping impacts on the Lower Deschutes River. The city's proposed mitigation will come from a combination of city-held surface water irrigation rights and surface water irrigation rights acquired through the Central Oregon Water Bank, a partnership between Swalley Irrigation District, Central Oregon Irrigation District, the Deschutes River Conservancy, and several mitigation buyers including the City of Redmond. The water system CIP, included in the appendices to this report, includes an estimated cost for mitigation.

Storage

The current storage facilities are adequate to provide peaking, fire, and emergency storage to customers, with a slight surplus. Based on the design criteria that the city has adopted, the projected storage deficit at 2030 will be 11.8 million gallons (MG). At least three future

reservoirs are currently being planned within the system between now and 2030 to meet this deficit.

Distribution System Analysis

The city's water distribution system was evaluated under existing and future conditions using a hydraulic modeling software package. A hydraulic model is an electronic representation of the pipes and facilities included in a distribution system. The model is used to predict flows and friction losses in pipes, along with pressures and hydraulic grades at different points in the system.

Pipelines

As has been shown by the existing and future hydraulic analyses, the city has few overall deficiencies in terms of low pressures or high velocities. A number of localized fire flow deficiencies were noted and will be addressed; however, these deficiencies are primarily caused by older undersized pipelines that were installed when fire flow requirements were lower.

One of the city's goals is to ensure that adequate redundancy and transmission capacity exists in the system so that if a single large pipeline or well is out of service, water can still be supplied to all customers without any significant difference in pressure or quality. To meet this goal, a number of pipeline enhancements were identified to establish a minimum 12-inch-diameter pipeline grid that connects all sources of supply and runs from east to west and north to south. This pipeline grid, along with a dispersed network of wells, will create a significant level of redundancy and flexibility for future growth, regardless of where it occurs.

Water System Capital Improvements Plan

The master plan report presents a detailed projects list update for Redmond's water system. The total cost for all projects identified for the 2007-2015 period is $21.5 million. The highest cost projects consist of the following:

- Several sections of 12-inch transmission mains
- Replacement of old and undersized pipe in the downtown area
- Completion of the Well 7 pump station
- Addition of Wells 8 and 9 as demands grow
- Addition of a storage tank located by Well 7
- Purchase of mitigation credits to allow use of the city's new water rights permit.

SECTION 6-2: DRAFT WATER CAPITAL IMPROVEMENT PLAN

Water System Capital Improvements Plan

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				Allocations		Pipelines		Costs			Cost Allocations				
Implementation Phase	ID	Improvement Description	Reason for Improvement	Upgrade Existing	Adds Capacity	Length (ft.)	Diameter (in.)	Construction or Mitigation	Allowance for Engineering & Administration	Total Estimate	Developer/ Assessment	Existing	Additional for Growth	Growth	Location
2007-2015	P-11	Pipe	Fire flow	25%	75%	180	8	$14,000	$3,000	$17,000	$17,000	$0	$0	$0	West from west end of NW Poplar Pl to existing 4-inch pipe east of NW 11th St
2007-2015	P-13	Pipe	Redundancy and fire flow	0%	100%	340	8	$27,000	$5,000	$32,000	$32,000	$0	$0	$0	Along NW 8th St from NW Negus Pl to NW Oak Pl
2007-2015	P-16	Pipe	Fire flow	25%	75%	1,660	12	$199,000	$30,000	$229,000	$153,000	$0	$76,000	$76,000	From Canal Rd east to 4th St and then south to Hemlock St
2007-2015	P-17	Pipe	Redundancy and replacement of poor condition pipe	50%	50%	7,800	12	$936,000	$141,000	$1,077,000	$1,077,000	$538,500	$538,500	$538,500	Along NW 9th St from NW Maple Ave to SW Highland Ave
2007-2015	P-18	Pipe	Fire flow	25%	75%	440	8	$35,000	$6,000	$41,000	$41,000	$0	$0	$0	Along NW Fir Ave from west of NW 7th St to mid-block between NW 6th St and NW 5th St
2007-2015	P-19	Pipe	Fire flow	25%	75%	990	8	$79,000	$12,000	$91,000	$91,000	$0	$0	$0	Along NW 5th St from W Antler Ave to NW Dogwood Ave
2007-2015	P-20	Pipe	Fire flow	25%	75%	270	8	$22,000	$4,000	$26,000	$26,000	$0	$0	$0	270 ft along NW Birch Ave from NW 12th St
2007-2015	P-21	Pipe	Fire flow	75%	25%	380	8	$30,000	$5,000	$35,000	$35,000	$0	$0	$0	Along NW 12th St from NW Birch Ave to W Antler Ave
2007-2015	P-22	Pipe	Growth and redundancy	0%	100%	780	8	$62,000	$10,000	$72,000	$72,000	$0	$0	$0	North from W Antler Ave between SW 17th St and SW 15th St to south end of cul-de-sac
2007-2015	P-23	Pipe	Fire flow	25%	75%	260	8	$21,000	$4,000	$25,000	$25,000	$0	$0	$0	Along SW Deschutes Ave from SW 12th St to SW 13th St
2007-2015	P-24	Pipe	Fire flow	100%	0%	330	12	$40,000	$6,000	$46,000	$46,000	$0	$0	$0	Along SW 2nd St from SW Black Butte Blvd to W Antler Ave
2007-2015	P-25	Pipe	Fire flow	25%	75%	290	8	$23,000	$4,000	$27,000	$27,000	$0	$0	$0	Along SE Deschutes Ave from SE Franklin Ave to SE Warsaw St
2007-2015	P-26	Pipe	Fire flow	25%	75%	320	8	$26,000	$4,000	$30,000	$30,000	$0	$0	$0	Along SW 4th St from SW Forest Ave to SW Evergreen Ave
2007-2015	P-27a	Pipe	Growth	0%	100%	2,800	12	$336,000	$51,000	$387,000	$0	$0	$387,000	$387,000	NW Spruce Ave, between Northwest 22nd and Dry Canyon
2007-2015	P-28	Pipe	Growth and redundancy	0%	100%	860	10	$86,000	$13,000	$99,000	$99,000	$0	$0	$0	Along SE Lake Rd between SE 1st St and E Hwy 126
2007-2015	P-29	Pipe	Fire flow	75%	25%	260	8	$21,000	$4,000	$25,000	$25,000	$0	$0	$0	Along SW 14th St from SW Highland Ave to SW Glacier Ave
2007-2015	P-31	Pipe	Fire flow	75%	25%	460	12	$55,000	$9,000	$64,000	$64,000	$0	$0	$0	Along SW 10th St from USFS Dr to south end of SW 10th St
2007-2015	P-34	Pipe	Fire flow	25%	75%	280	8	$0	$0	$0	$0	$0	$0	$0	Along SW Quartz Ave from SW 27th St to SW 27th Pl
2007-2015	P-40	Pipe	Fire flow	25%	75%	1,640	12	$197,000	$30,000	$227,000	$151,000	$0	$76,000	$76,000	Along S Hwy 97 from SW Wickiup Ave to SW Odem Medo Way
2007-2015	P-41	Pipe	Fire flow	75%	25%	1,030	10	$103,000	$16,000	$119,000	$95,000	$0	$24,000	$24,000	Along SW Yew Ave between SW Canal Blvd and the Hwy 97 on ramp
2007-2015	P-42	Pipe	Fire flow	75%	25%	2,800	12	$336,000	$51,000	$387,000	$258,000	$0	$129,000	$129,000	SW 19th St, South of Airport Way
2007-2015	P-43	Pipe	Fire flow	25%	75%	270	12	$32,000	$5,000	$37,000	$25,000	$0	$12,000	$12,000	End of SE Salmon Ave
2007-2015	P-44	Pipe	Fire flow	25%	75%	2,100	16	$336,000	$51,000	$387,000	$290,000	$0	$97,000	$97,000	Parallel to E Highway 126, east of SE Veterans Way
2007-2015	P-51	Pipe	Growth and redundancy	0%	100%	480	8	$38,000	$6,000	$44,000	$44,000	$0	$0	$0	SW 31st St between Deschutes and Forest
2007-2015	P-55	Pipe	Fire flow	25%	75%	170	8	$14,000	$3,000	$17,000	$17,000	$0	$0	$0	Along SW Wickiup Ave between SW 28th St and SW 27th St
2007-2015	P-56	Pipe	Fire flow	25%	75%	330	8	$26,000	$4,000	$30,000	$30,000	$0	$0	$0	Along SW Canal Blvd between SW Wickiup Ave and SW 23rd St

Water System Capital Improvements Plan

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Implementation Phase	ID	Improvement Description	Reason for Improvement	Allocations: Upgrade Existing	Allocations: Adds Capacity	Pipelines: Length (ft.)	Pipelines: Diameter (in.)	Costs: Construction or Mitigation	Costs: Allowance for Engineering & Administration	Costs: Total Estimate	Cost Allocations: Developer/ Assessment	Cost Allocations: Existing	Cost Allocations: Additional for Growth	Cost Allocations: Growth	Location
2007-2015	P-57	Pipe	Growth and redundancy	100%	0%	3470	12	$416,000	$63,000	$479,000	$479,000	$0	$0	$0	Lake Rd (1st St) to 9th St Connection
2007-2015	P-66	Pipe	Growth and redundancy	50%	50%	3,068	12	$368,000	$56,000	$424,000	$212,000	$0	$212,000	$212,000	On Black Butte Rd, from 12th St to SW 2nd
2007-2015	PR-1	Pipe Replacement (6"-8" PVC)	Poor pipe condition	100%	0%	7,500	8	$720,000	$108,000	$828,000	$0	$828,000		$0	Area between SW 27th St and SW 35th St and between W Antler Ave and SW Glacier Ave
2007-2015	PR-2	Pipe Replacement (6"-8" PVC)	Poor pipe condition	100%	0%	5,700	8	$547,000	$83,000	$630,000	$0	$630,000		$0	Area between NW 10th St to NW 15th St and between NW Quince Ave and NW Canyon Dr
2007-2015	PR-3	Pipe Replacement (1"-6") in downtown area	Undersized and poor condition pipe	100%	0%	9,720	8	$933,000	$140,000	$1,073,000	$0	$1,073,000		$0	
2007-2015	PR-4	Pipe Replacement east of downtown	Undersized and poor condition pipe	100%	0%	5,480	8	$526,000	$79,000	$605,000	$0	$605,000		$0	
2007-2015	R-1	Reservoir: Well 7 site, No. 1	Future storage. Volume = 3.5 MG. Steel tank.	0%	100%			$3,500,000	$525,000	$4,025,000	$0	$0		$4,025,000	NE 11th Street south of NE Greenwood Ave
2007-2015	V-1	Valve: pressure reducing (PRV)	Locate on pressure zone boundary, in northwest area.	0%	100%			$50,000	$8,000	$58,000	$0	$0		$58,000	Northwest Way and Maple Ave
2007-2015	V-2	Valve: check	Located in southeast, at boundary between PZ2 and PZ3.	75%	25%			$50,000	$8,000	$58,000	$0	$43,000		$15,000	SE Airport Way between Mt Jefferson DR and Mt Hood Dr
2007-2015	W-1	Well 8	Supply increase	0%	100%			$2,020,000	$303,000	$2,323,000	$0	$0		$2,323,000	NW Maple Ave west of NW Canyon Dr
2007-2015	W-5	Well 9	Supply increase	0%	100%			$2,020,000	$303,000	$2,323,000	$0	$0		$2,323,000	New school well site, vicinity of SW Elkhorn Ave and SW 43rd St
2007-2015	M-1	Mitigation credits purchase	To enable use of additional water rights	0%	100%			$1,748,500	$0	$1,748,500	$0	$0		$1,748,500	
2007-2015	**Phase 1 Subtotal**		**$18,145,500**								$3,461,000	$3,717,500		$12,044,000	
2016-2020	P-10	Pipe	Growth and redundancy	50%	50%	610	12	$73,000	$11,000	$84,000	$56,000		$28,000	$28,000	Along W Antler Ave from NW 25th St to NW 23rd St
2016-2020	P-14	Pipe	Fire flow	25%	75%	1,630	8	$130,000	$20,000	$150,000	$150,000		$0	$0	South from east end of NE Quince Ave to intersection of NE 8th St and NE Oak Pl
2016-2020	P-2	Pipe	Growth and redundancy	0%	100%	2,450	12	$294,000	$45,000	$339,000	$183,000		$156,000	$156,000	East from Northwest Way and NW 22nd St to NW 19th St, north of NW Quince Ave
2016-2020	P-30	Pipe	Growth and redundancy	0%	100%	500	8	$40,000	$6,000	$46,000	$46,000		$0	$0	Along SW 27th St from SW Glacier Ave to SW Highland Ave
2016-2020	P-32	Pipe	Growth and redundancy	50%	50%	1,320	12	$158,000	$24,000	$182,000	$121,000		$61,000	$61,000	Along SW 35th St from SW Obsidian Ave to SW Quartz Ave
2016-2020	P-33	Pipe	Growth and redundancy	50%	50%	1,320	16	$211,000	$32,000	$243,000	$122,000		$121,000	$121,000	Along SW Quartz Ave from SW 35th St to SW 31st St
2016-2020	P-39	Pipe	Fire flow	25%	75%	370	8	$30,000	$5,000	$35,000	$35,000		$0	$0	Along SW Timber Ave from SW 25th St to SW 24th St

Water System Capital Improvements Plan

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				Allocations		Pipelines		Costs			Cost Allocations				
Implementation Phase	**ID**	**Improvement Description**	**Reason for Improvement**	**Upgrade Existing**	**Adds Capacity**	**Length (ft.)**	**Diameter (in.)**	**Construction or Mitigation**	**Allowance for Engineering & Administration**	**Total Estimate**	**Developer/ Assessment**	**Existing**	**Additional for Growth**	**Growth**	**Location**
2016-2020	P-4	Pipe	Growth and redundancy	0%	100%	1,340	12	$161,000	$25,000	$186,000	$0		$186,000	$186,000	Along NW Maple Ave from NW 23rd St to NW 19th St
2016-2020	P-45	Pipe	Growth and redundancy	0%	100%	1,300	18	$234,000	$36,000	$270,000	$180,000		$90,000	$90,000	SE 9th St between E Antler Ave and SE Evergreen Ave
2016-2020	P-46	Pipe	Growth and redundancy	75%	25%	1,150	16	$138,000	$21,000	$159,000	$159,000		$0	$0	Along E Antler Ave from NW Canal Blvd to NE 9th St
2016-2020	P-53	Pipe	Growth and redundancy	0%	100%	5,400	12	$648,000	$48,000	$696,000	$464,000		$232,000	$232,000	Along NW Canal Blvd, from NW Maple Ave to NE King Way and Along NE King Way to NE 5th St
2016-2020	P-9	Pipe	Growth and redundancy	0%	100%	620	12	$74,000	$12,000	$86,000	$57,000		$29,000	$29,000	Along W Antler Ave from NW 35th St to NW 27th St
2021-2025	P-60	Pipe	Growth	0%	100%	5,630	12	$676,000	$102,000	$778,000	$519,000		$259,000	$259,000	Completion of pipe loop on Badger and Antelope
2016-2020	W-4	Well 10	Supply increase	0%	100%			$2,020,000	$303,000	$2,323,000		$0		$2,323,000	NW Hemlock Ave, west of NW 28th St
2016-2020	M-2	Mitigation credits purchase	To enable use of additional water rights	0%	100%			$1,748,500	$0	$1,748,500		$0		$1,748,500	
2016-2020	**Phase 2 Subtotal**		**$7,325,500**								$2,092,000	$0	$1,162,000	$5,233,500	
2021-2025	P-1	Pipe	Growth and redundancy	0%	100%	2,250	8	$180,000	$27,000	$207,000	$207,000		$0	$0	East from Northwest Way and NW Upas Ave to NW 22nd St
2021-2025	P-15	Pipe	Growth and redundancy	0%	100%	1,560	12	$187,000	$29,000	$216,000	$144,000		$72,000	$72,000	East from Northwest Way and NW Upas Ave to intersection of NW 22nd St and NW 19th St
2021-2025	P-3	Pipe	Growth and redundancy	0%	100%	5,300	12	$636,000	$96,000	$732,000	$488,000		$244,000	$244,000	Northwest Way between NW Maple Ave and NW Upas Ave
2021-2025	P-36	Pipe	Growth and redundancy	0%	100%	2,710	12	$325,000	$49,000	$374,000	$249,000		$125,000	$125,000	NW Hemlock Ave between NW Helmholtz Way and NW 35th St
2021-2025	P-38	Pipe	Growth	0%	100%	9,380	16	$1,501,000	$226,000	$1,727,000	$864,000		$863,000	$863,000	South from the south end of SW 47th St to SW Badger Ave, east along SW Badger Ave to SW Canal Blvd
2021-2025	P-48	Pipe	Growth and redundancy	0%	100%	2,680	12	$322,000	$49,000	$371,000	$247,000		$124,000	$124,000	Connecting SW Helmholtz Way and W-5, south of Highland
2021-2025	P-49	Pipe	Growth and redundancy	0%	100%	2,680	16	$429,000	$65,000	$494,000	$247,000		$247,000	$247,000	SW Obsidian Ave between SW Helmholtz Way and SW 35th St
2021-2025	P-50	Pipe	Growth and redundancy	0%	100%	670	12	$80,000	$12,000	$92,000	$61,000		$31,000	$31,000	NW 23rd St between NW Fir Ave and NW Hemlock Ave
2021-2025	P-52	Pipe	Growth and redundancy	0%	100%	2,060	18	$371,000	$48,000	$419,000	$186,000		$233,000	$233,000	Along E Antler Ave from NW Canal Blvd to NE 9th St and new FHB reservoir
2021-2025	P-54	Pipe	Growth and redundancy	0%	100%	440	12	$53,000	$8,000	$61,000	$41,000		$20,000	$20,000	From PS-2 along SW Volcano Ave to SW Reservoir Dr
2021-2025	P-58	Pipe	Growth and redundancy	0%	100%	7,880	12	$946,000	$142,000	$1,088,000	$725,000		$363,000	$363,000	NW 10th to Pershall and along new Pershall alignment to NW 27th
2021-2025	P-59	Pipe	Growth	0%	100%	8,420	12	$1,010,000	$152,000	$1,162,000	$775,000		$387,000	$387,000	From Elkhorn and Canal northwest to Wickiup
2021-2025	P-63	Pipe	Growth	0%	100%	2,340	12	$281,000	$43,000	$324,000	$216,000		$108,000	$108,000	Along Highway 97 on the south end of the city
2021-2025	P-64	Pipe	Growth	0%	100%	4,360	12	$523,000	$79,000	$602,000	$401,000		$201,000	$201,000	

Water System Capital Improvements Plan

Jan '-07 $

				Allocations		Pipelines		Costs			Cost Allocations				
Implementation Phase	**ID**	**Improvement Description**	**Reason for Improvement**	**Upgrade Existing**	**Adds Capacity**	**Length (ft.)**	**Diameter (in.)**	**Construction or Mitigation**	**Allowance for Engineering & Administration**	**Total Estimate**	**Developer/ Assessment**	**Existing**	**Additional for Growth**	**Growth**	**Location**
2021-2025	P-6	Pipe	Growth and redundancy	0%	100%	7,630	12	$916,000	$138,000	$1,054,000	$703,000		$351,000	$351,000	Along NW 35th St from NW Maple Ave to SW Evergreen Ave
2021-2025	P-7	Pipe	Growth and redundancy	0%	100%	2,580	12	$310,000	$47,000	$357,000	$238,000		$119,000	$119,000	Along Northwest Way from NW Maple Ave to Hemlock Ave
2021-2025	P-8	Pipe	Growth and redundancy	0%	100%	3,990	12	$479,000	$72,000	$551,000	$367,000		$184,000	$184,000	Along NW Hemlock Ave from NW 35th St to NW 23rd St
2021-2025	PS-2	Pump Station	Supply to Zone 1	100%	0%			$1,000,000	$150,000	$1,150,000		$1,150,000		$0	SW Volcano and SW 43rd
2021-2025	R-2	Reservoir: Forked Horn Butte	Future storage. Volume = 4.0 MG. Prestressed concrete tank. (Partially buried.)	0%	100%			$5,600,000	$840,000	$6,440,000				$6,440,000	SW Volcano and SW 43rd
2021-2025	W-3	Well 11	Supply increase	0%	100%			$2,020,000	$303,000	$2,323,000				$2,323,000	SW Quartz Ave and SW 31st St
2021-2025	M-3	Mitigation credits purchase	To enable use of additional water rights	0%	100%			$1,748,500	$0	$1,748,500				$1,748,500	
2012-2025	**Phase 3 Subtotal**		**$21,492,500**								$6,159,000	$1,150,000		$14,183,500	
2026-2030	P-27b	Pipe	Growth		100%	7,700	12								Western portion, from 27th west to Helmholtz St.
2026-2030	P-35	Pipe	Growth and redundancy	0%	100%	7,920	12	$950,000	$143,000	$1,093,000	$729,000		$364,000	$364,000	East on NW Maple Ave from NW 35th St to NW Helmholtz Way, south on NW Helmholtz Way to W Antler Ave
2026-2030	P-37	Pipe	Growth and redundancy	0%	100%	2,660	12	$319,000	$48,000	$367,000	$245,000		$122,000	$122,000	W Antler Ave between NE Helmholtz Way and NW 35th St
2026-2030	P-47	Pipe	Growth and redundancy	0%	100%	6,780	16	$1,085,000	$163,000	$1,248,000	$624,000		$624,000	$624,000	SW Helmholtz Way between W Antler Ave and Quartz
2026-2030	P-61	Pipe	Growth	0%	100%	1,860	12	$223,000	$34,000	$257,000	$171,000		$86,000	$86,000	South from intersection of Badger and Antelope to Elkhorn
2026-2030	P-62	Pipe	Growth	0%	100%	3,560	12	$427,000	$65,000	$492,000	$328,000		$164,000	$164,000	On Elkhorn and 19th St (connects to P-42)
2026-2030	P-65	Pipe	Growth	0%	100%	3,060	12	$367,000	$56,000	$423,000	$282,000		$141,000	$141,000	On Elkhorn, connecting P61 and P-62
2026-2030	P-5	Pipe	Growth and redundancy	0%	100%	3,950	12	$474,000	$72,000	$546,000	$364,000		$182,000	$182,000	Along NW Maple Ave from NW 35th St to NW 22nd St
2026-2030	R-3	Reservoir: Well 7 site, No. 2	Future storage. Volume = 3.5 MG. Steel tank.	0%	100%			$3,500,000	$525,000	$4,025,000				$4,025,000	NE 11th Street south of NE Greenwood Ave
2026-2030	V-3	Valve: pressure reducing (PRV)	Pressure zone boundary along on west edge	0%	100%			$50,000	$8,000	$58,000		$0		$58,000	NW Maple Ave and NW Helmholtz Way
2026-2030	W-6	Well 12	Supply increase (1720 gpm)	0%	100%			$1,717,000	$258,000	$1,975,000				$1,975,000	Locate in NE Redmond, inside of UGB

Water System Capital Improvements Plan

Jan '-07 $

Implementation Phase	ID	Improvement Description	Reason for Improvement	Allocations: Upgrade Existing	Allocations: Adds Capacity	Pipelines: Length (ft.)	Pipelines: Diameter (in.)	Costs: Construction or Mitigation	Costs: Allowance for Engineering & Administration	Costs: Total Estimate	Cost Allocations: Developer/ Assessment	Cost Allocations: Existing	Cost Allocations: Additional for Growth	Cost Allocations: Growth	Location
2026-2030	M-4	Mitigation credits purchase	To enable use of additional water rights	0%	100%			$1,748,500	$0	$1,748,500		$0		$1,748,500	
2026-2030	**Phase 4 Subtotal**		**$12,232,500**								$2,743,000	$0		$9,489,500	
							TOTALS	**$52,400,000**	**$6,800,000**	**$59,196,000**				**$40,950,500**	

2. Pipe Priority Level:
   1 = Residential Fire Flow Improvement, less than 1,000 gpm available
   2 = Commercial or Industrial Fire Flow Improvement, less than 75% of required flow available
   3 = Fire Flow Improvement, more than 75% of required flow available
   4 = Not driven by fire flow deficiency
3. Cost index: ENR CCI Seattle Area = 8626 (January 2007)
4. A 15% allowance was included for engineering and administration. This may be inadequate for some projects, especially for those with involved designs, significant permitting, or requiring high levels of services during construction.
5. Allowance cost for purchase of mitigation credits was provided by city. Actual costs may vary.
6. Project P-12, a 12-inch pipe on NW Quince Ave., between NW 10th St. and NW 7th St., was constructed in summer 2007 as the master plan was being completed.

SECTION 6-3: CIP MAPS

N

0 1,500 3,000 Feet

Legend

Proposed Facilities
- Pump Station
- Reservoir
- PRV
- Well

Pipe Improvements
- Future Grid and Redundancy
- Fire Flow Improvement

System Facilities
- PRV
- Pump Station
- Reservoir
- Well

Pipes
- < 8"
- 8"
- 10" - 12"
- 16"
- > 16"
- Pipe Replacement Area
- Poor Pipe Condition Area

Pressure Zones
- PZ1 - High
- PZ2 - 3180
- PZ 3 - 3A
- PZ 3 - 3A

Future Service Areas
- PZ 1 - High
- PZ 2 - 3180
- PZ 3 - 3A
- PZ 3 - 3A

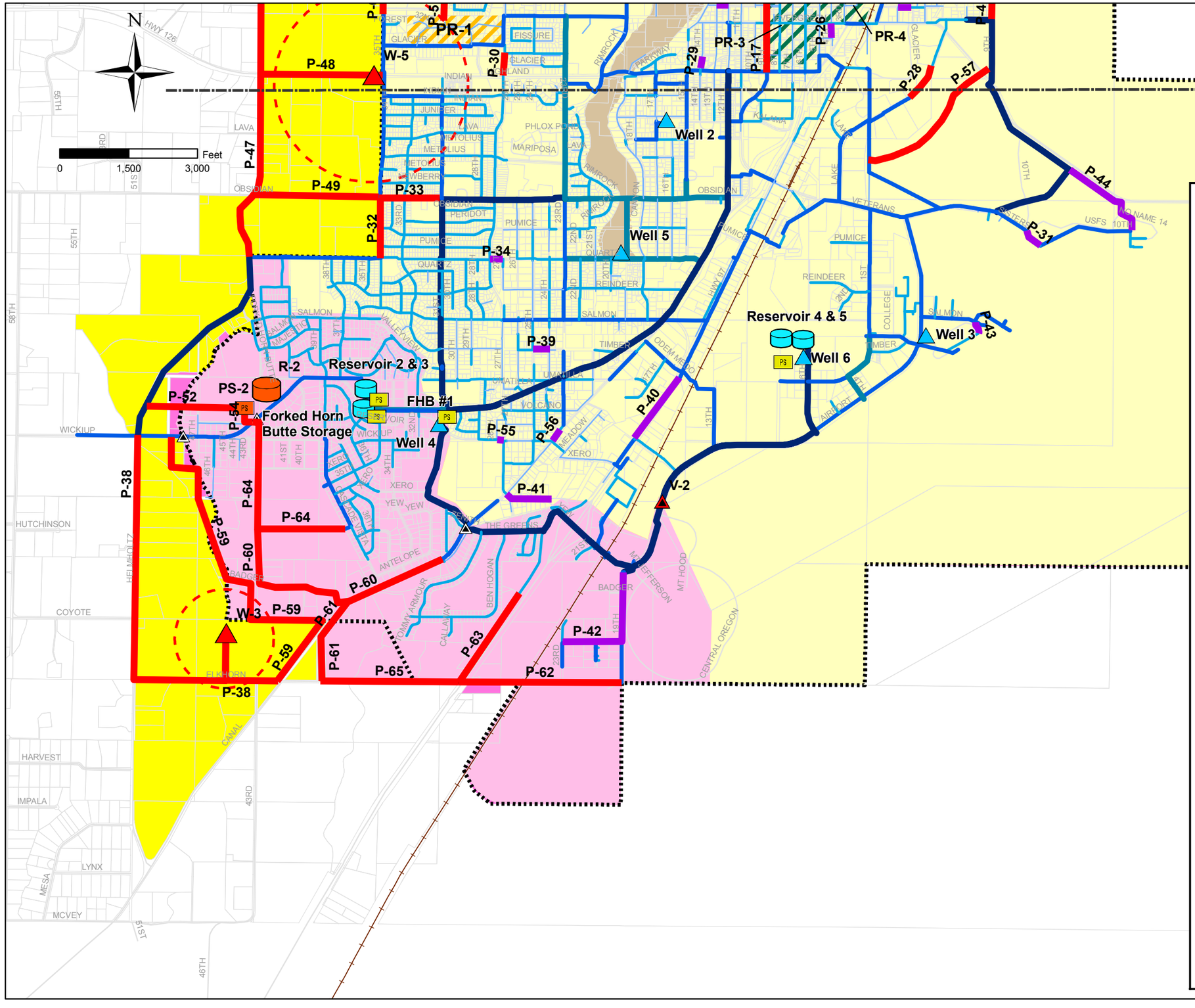
MATCHLINE

EXHIBIT 4-31a, North Panel
Recommended System Improvements
Redmond Water System Plan Addendum

CITY OF REDMOND, OR
February 2008

CH2MHILL

EXHIBIT 4-31b, South Panel
Recommended System Improvements
Redmond Water System Plan Addendum



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SECTION 6-4: WATER SDC ANALYSIS

Water SDC Methodology

This section presents the water SDC calculations based on the general methodology and requirements presented in the previous section.

2.1 Determine Capacity Needs

For water systems, capacity requirements are generally defined based on the following system design criteria:

- Maximum Day Demand (MDD) -- The highest daily recorded rate of water in a year.
- Storage Requirements –Including operational (or equalization) storage, and storage for emergency and fire protection needs. The ratio of total future storage needs to 2030 MDD for the City as identified in the Master Plan is 0.67.

As shown in Table 1, the total system demands under MDD conditions are projected to be 31.9 million gallons per day (mgd) at the end of the planning period. Existing system users' MDD capacity requirements are approximately 11.5 mgd. The MDD capacity required by growth is expected to be 20.4 mgd, and represents 64 percent of the future total MDD. Storage requirements are currently about 8.2 million gallons (mg) and are expected to increase 13.6 mg during the planning period.

TABLE 1
City of Redmond
Water SDC Analysis
Planning Assumptions

	Existing	Buildout	Growth
MDD (mgd)	11.5	31.9	20.4
Storage (mg)	8.20	21.8	13.6

Source: Wastewater (Collection System) and Water System Master Plan

Current system capacities and available capacities vary among system components, as shown in Table 2. As indicated previously, Oregon SDC law allows for inclusion of a reimbursement fee, if existing system capacity may be demonstrated. The current capacity of the supply system (including Wells 1 through 6) is 11.5 mgd, which is about equal to current MDD; therefore, growth's capacity needs will be met by expansion to the system, including the current construction of Well 7. Existing storage capacity is estimated to be 10.0 mg, compared to existing capacity requirements of 8.2 mg, leaving a small amount (18 percent) of available capacity to serve growth.

TABLE 2
City of Redmond
Water SDC Analysis
Capacity Analysis By Component

Component	Existing Capacity	Existing Requirements	Available Capacity	% Available
Water rights (mgd)				
Current	12.80	11.55	1.25	10%
Pending	16.20	-	16.20	100%
Wells (mgd)				
1-6	11.50	11.55	(0.05)	0%
7 (in process)	3.60	-	3.60	100%
Storage (mg)	10.00	8.20	1.80	18%

2.2 Develop Cost Basis

As demonstrated in Table 2, the capacity needed to serve new development will be met through a combination of existing and planned system improvements. The reimbursement fee is intended to recover the costs associated with the growth-related (or available) capacity in the existing system; the improvement fee is based on the costs of capacity-increasing future improvements needed to meet the demands of growth. The value of capacity needed to serve growth in aggregate within the planning period, adjusted for expected contributions, is referred to as the "cost basis".

2.2.1 Reimbursement Fee Cost Basis

Table 3 shows the reimbursement fee cost basis calculation, based on the original cost of existing system assets and work in progress. The total system value, including fixed assets as of June 30, 2007 and construction work in progress for fiscal year 2007-08, is about $24 million based on data provided by the City. Growth capacity by component is determined based on the available capacity analysis shown in Table 2.

For distribution improvements, approximately 71 percent of the existing system value is assumed to have been developer-funded. Developers are generally required to install the first eight inches of pipe to serve the local development needs. Based on the existing system inventory of pipe length by size, 71 percent of the system has pipe that is 8 inches or smaller. Therefore, 71 percent of the distribution system costs are assumed to have been contributed by developers. This is a conservative assumption, given that the City has likely funded some of the original construction; however, the fixed asset records do not track these contributions separately. For pipes over 8 inches in diameter, growth is allocated costs in proportion to total future MDD, as these pipes are assumed to have been sized for build-out.

Table 3
City of Redmond
Water System Development Charge
Reimbursement Fee Cost Basis

	System Component				
	Wells	**Mitigation**	**Storage**	**Transmission & Distribution**	**Total**
Fixed Assets (June 30, 2007)	$85,657	$1,106,000	$3,744,202	$15,440,040	$20,375,899
Less Developer Contributions				$10,962,429	$10,962,429
Net Cost	$85,657	$1,106,000	$3,744,202	$4,477,612	$9,413,471
Available Capacity (%)	0%	100%	18%	64%	
Subtotal Fixed Assets	$0	$1,106,000	$673,956	$2,856,407	$4,636,364
Work in Progress (WIP)					
Well #7					
Drilling	$612,881				$612,881
Land Acquisition	$750,000				$750,000
Pump station	$1,955,000				$1,955,000
Forked Horn Butte Res Land			$722,627		$722,627
Available Capacity for Growth	100%		100%		
Subtotal WIP	$3,317,881	$0	$722,627	$0	$4,040,508
Total Cost Basis	**$3,317,881**	**$1,106,000**	**$1,396,584**	**$2,856,407**	**$8,676,872**

The total reimbursement cost basis is almost $8.7 million, including $3.3 million in for Well #7, $1.1 million for mitigation (based on the City's existing 1,106 acres of surface water rights it plans to transfer to provide mitigation, valued at $1,000 per acre), $1.4 million in storage assets (including work in progress) and $2.9 million in distribution system assets.

2.2.2 Improvement Fee Cost Basis

Each improvement on the CIP was reviewed to determine the portion of costs that expand capacity for growth. The resulting cost allocations by project are shown in Appendix A. Table 4 provides a summary of the improvements by construction phase and component. As shown in Table 4, the total growth cost (improvement fee cost basis) is almost $41 million, about 69 percent of the total CIP.

Improvement costs are allocated to growth in proportion to growth's projected share of the planned capacity expansion, as shown in Table 5. With the exception of distribution projects which benefit both existing and new customers, the other projects on the CIP expand capacity for growth, as existing customers' capacity needs are met by existing facilities. The distribution system allocations vary by individual project (shown in Appendix A) and are based on hydraulic modeling performed as part of the Master Plan.

Table 4
City of Redmond
Water System Development Charge
Summary of Improvement Fee Cost Basis

		SDC (Growth)	
Phase/Component	**Total**	**%**	**$**
Phase 1			
Mitigation	$1,748,500	100%	$1,748,500
Wells	$4,646,000	100%	$4,646,000
Storage & Pump	$4,025,000	100%	$4,025,000
Distribution	$7,726,000	21%	$1,624,500
Subtotal	$18,145,500	66%	$12,044,000
Phase 2			
Mitigation	$1,748,500	100%	$1,748,500
Wells	$2,323,000	100%	$2,323,000
Storage & Pump	$0	0%	$0
Distribution	$3,254,000	0%	$1,162,000
Subtotal	$7,325,500	71%	$5,233,500
Phase 3			
Mitigation	$1,748,500	100%	$1,748,500
Wells	$2,323,000	100%	$2,323,000
Storage & Pump	$7,590,000	85%	$6,440,000
Distribution	$9,831,000	37%	$3,672,000
Subtotal	$21,492,500	66%	$14,183,500
Phase 4			
Mitigation	$1,748,500	100%	$1,748,500
Wells	$1,975,000	100%	$1,975,000
Storage & Pump	$4,025,000	100%	$4,025,000
Distribution	$4,484,000	39%	$1,741,000
Subtotal	$12,232,500	78%	$9,489,500
Total Annual Costs	**$59,196,000**	**69%**	**$40,950,500**

Table 5
City of Redmond
Water SDC Analysis
Improvement Allocation Percentages

Future Capacity Analysis	**Total Additional Capacity**	**Existing Requirements**	**Growth Requirements**	**% Growth**
Mitigation		-		100%
Wells 8-12 (mgd)	6.9	-	16.9	100%
Storage (mg)	11.0	-	11.0	100%
Distribution	Based on individual pipe segment analysis			

2.3 Develop SDC Schedule

System-wide unit costs of capacity are determined by dividing the reimbursement fee and improvement fee cost bases identified in Tables 3 and 4 by the aggregate growth-related capacity requirements defined in Table 1. These unit costs are then applied to the capacity requirements of a typical dwelling unit to determine the SDC per equivalent dwelling unit (EDU). The EDU rate is then scaled up or down for each development type, based on estimated capacity requirements.

2.3.1 EDU Capacity Requirements

Equivalent Dwelling Units for water systems are generally defined by the number of meter equivalents in the system. Meter equivalents measure the hydraulic capacity of different meters in the system relative to that of a typical residential meter (5/8- or 3/4-inch). The number of meters by meter size are reviewed and multiplied by the hydraulic equivalency of each meter size, relative to a 5/8-inch meter to determine the number of meter equivalencies for each historical year. As indicated in Table 6, the water system currently consists of about 11,000 meter equivalents.

TABLE 6
City of Redmond
Water SDC Analysis
EDU Capacity Requirements

Year	Number of Meter Equivalents	MDD (mgd)	Use Per Meter Equivalent (mgd)	Use Per Meter Equivalent (gpd)
2004	9,843	10.50	0.001067	1,067
2005	10,173	10.90	0.001072	1,072
2006	11,020	11.55	0.001048	1,048
Average			0.001062	1,062

Source: Wastewater (Collection System) and Water System Master Plan Exhibit 4-10 for 2004 and 2005; 2006 estimated based on trendline. Meter equivalents from City billing records.

The MDD per meter equivalent is determined by dividing system MDD in each year, by the number of meter equivalents for the same year. As shown in Table 6, the MDD per EDU has ranged from about 1,048 gallons per day (gpd) to 1,072 gpd, resulting in a 3-year average of 1,062 gpd.

Storage requirements per EDU are estimated based on the ratio of storage needs to MDD. As shown in Table 1, growth storage needs are 13.6 mg, compared to a MDD of 20.4 (13.6 / 20.4 = 0.67). Therefore, the EDU capacity requirements for storage are assumed to be 0.67 X 1,062 = 710 gpd.

2.3.2 Reimbursement Fee

Table 7 shows the reimbursement fee calculation. The cost basis figures by system component from Table 3 are divided by aggregate growth capacity requirements from Table 1 to determine the system-wide unit costs of capacity. These unit costs are then multiplied by the capacity requirements per EDU to determine the SDC. As indicated in Table 7, the

total reimbursement fee per EDU is $453, including $173 for well facilities, $58 for mitigation, $73 for storage facilities and $149 for distribution facilities.

Table 7
City of Redmond
Water System Development Charge
Reimbursement Fee Calculation

	System Component				
	Wells	**Mitigation**	**Storage**	**Transmission & Distribution**	**Total**
Reimbursement Cost Basis	$3,317,881	$1,106,000	$1,396,584	$2,856,407	$8,676,872
Aggregate Growth Capacity (mgd)	20.4	20.4	13.6	20.4	
Unit Cost ($/mgd)	$163,041	$54,349	$102,690	$140,364	
EDU Capacity Req. (mgd)	0.001062	0.001062	0.000710	0.001062	
Reimbursement Fee per EDU	**$173**	**$58**	**$73**	**$149**	**$453**

2.3.3 Improvement Fee

The improvement fee calculation is shown in Table 8. The growth costs from the CIP (Appendix A) are grouped by system component and then distributed over the aggregate growth capacity requirements through 2030. As for the reimbursement fee, the resulting unit costs of capacity are then multiplied by the EDU capacity requirements for each component. The resulting cost per EDU is $2,137, including $588 for well improvements, $365 for mitigation improvements, $756 for storage and pumping improvements, and $428 for transmission and distribution improvements.

Table 8
City of Redmond
Water System Development Charge
Improvement Fee Calculation

	System Component				
	Wells	**Mitigation**	**Storage and Pumping**	**Transmission & Distribution**	**Total**
Improvement Cost Basis	$11,267,000	$6,994,000	$14,490,000	$8,199,500	$40,950,500
Aggregate Growth Capacity (mgd)	20.4	20.4	13.6	20.4	
Unit Cost ($/mgd)	$553,661	$343,686	$1,065,441	$402,924	
EDU Capacity Req. (mgd)	0.001062	0.001062	0.000710	0.001062	
Improvement Fee per EDU	**$588**	**$365**	**$756**	**$428**	**$2,137**

2.3.4 Adjustments

The SDC methodology includes adjustments to the combined SDC for compliance costs, as well as a credit for future rate payments. Each is discussed below.

Compliance costs. Local governments are entitled to include in the SDCs a charge to recover costs associated with complying with the SDC law. Compliance costs include costs related to developing the SDC methodology and project list (that is, a portion of facility planning costs) and annual accounting costs. Table 9 shows the calculation of the

compliance charge per EDU, which is estimated to be $35. The annual number of EDUs is determined by multiplying the current number of meter equivalents (described earlier) by the average annual growth rate over the planning period (about 4 percent).

Table 9
City of Redmond
Water System Development Charge
Compliance Charge

Component	Years	Total	Growth	Annualized
SDC Study	5	$7,500	100%	$1,500
Master Planning	5	$90,000	69%	$12,451
Auditing/Accounting	1	$1,500	100%	$1,500
Total Annual Costs		$99,000		$15,451
Estimated Annual EDUs				441
Admin Charge/EDU				**$35**

Rate supported CIP credit. A credit to the combined SDC is included to recognize the contribution by new development toward CIP costs associated with providing capacity to serve existing customers. Once connected to the system, new customers will pay monthly user fees that are used to retire existing and future debt that will fund capital improvements that benefit existing customers (that is, a portion of supply and distribution system costs). A credit is provided – equal to the present value of the future payments per EDU – to recognize this future contribution. The amount of the credit is $6 per EDU.

2.3.5 Combined Fee

As shown in Table 10, the total SDC per EDU is $2,619, including the reimbursement component of $453, the improvement component of $2,137, and the adjustments.

Table10
City of Redmond
Water System Development Charge
Combined SDC per EDU

Component	Total
Reimbursement SDC per EDU	$453
Improvement SDC per EDU	$2,137
Combined SDC per EDU	$2,590
Rate-Supported CIP Credit	($6)
Compliance Charge	$35
Total SDC per EDU	**$2,619**
Current SDC per EDU	**$2,092**

As for the current SDCs, the revised SDCs are based on the estimated capacity requirements of each development type relative to a typical dwelling unit (with a 5/8-inch meter). The revised SDCs are shown in Table 11.

TABLE 11
City of Redmond
Water System Development Charge
Proposed SDC Schedule

Meter Size	Reimbursement	Improvement	Compliance	Credit	Total SDC	Meter Equivalent	Existing SDC
5/8-inch	$453	$2,137	$35	$6	$2,619	1	$2,092
3/4-inch	$679	$3,206	$52	$9	$3,929	1.5	$3,138
1-inch	$1,132	$5,343	$87	$15	$6,548	2.5	$5,230
1 1/2-inch	$2,264	$10,687	$175	$30	$13,096	5.0	$10,460
2-inch	$3,623	$17,099	$280	$48	$20,954	8.0	$16,739
3-inch	$7,246	$34,197	$560	$96	$41,907	16.0	$33,472
4-inch	$11,322	$53,433	$875	$150	$65,480	25.0	$52,300
6-inch	$22,644	$106,867	$1,750	$300	$130,960	50	$104,600

SECTION 7: WASTEWATER

The elements of the Wastewater Section include as follows:

1. Executive Summary
    a. Wastewater (Collections) Master Plan
    b. Water Pollution Control Facility Plan Update (Treatment Plant), Chapter 5

2. Capital Improvement Plans
    a. Wastewater Collections
    b. WPCF

3. CIP Maps

4. SDC Analysis

SECTION 7-1-A: WASTEWATER (COLLECTIONS) MASTER PLAN EXECUTIVE SUMMARY

Wastewater Collection System Executive Summary

Introduction

The City of Redmond owns and operates the wastewater and water utilities serving the city's residents. This master plan report presents plans for improving and expanding the water system and for the collection portion of the wastewater system. It recommends capital improvements to guide expansion of these systems to meet the needs when urban growth boundary (UGB) buildout occurs, which is expected in 2030. The plans also present conceptual approaches for addressing the needs to the limits of the Urban Reserve Area (URA).

The last master plan updates for these systems were completed in 2000. At that time, the city served a population of 13,700 and anticipated a buildout UGB population of 36,000 in 2020. As of July 2006, the city served a population of 23,500. The UGB buildout population was revised in 2007 to 58,000 in 2030. The city added approximately 2300 acres to the UGB in 2006 and created the URA totaling 5,600 acres.

Wastewater Plan

The City of Redmond's wastewater system includes both a collection system (that is, the pipelines and pump stations located throughout the city) and treatment facilities (the water pollution control facility—WPCF). This master plan addresses only the collection portion of the City's wastewater system. Planning for expanding and improving the WPCF was completed in another project and is summarized in the *WPCF Final Draft Facilities Plan Update* (November 2004).

Existing System

Redmond's 2006 wastewater service area encompassed approximately 5,800 acres and contained almost 800,000 feet of pipelines. The system included 13 sewer lift stations that collect gravity flows from subdivisions or developments and discharge through force mains into gravity sewer mains. The collection system conveys sanitary flows and, occasionally, stormwater to the WPCF with very little rainfall-induced infiltration and inflow.

Wastewater Flows

The average daily wastewater flow for the period 2000-2006 was 80 gallons per capita per day (gpcd). The 2006 winter time (non-irrigation season) flow was approximately 1.9 million gallons per day (mgd). The estimated future average daily flow is approximately 6.9 mgd in year 2030, and the year 2030 peak hour flow estimate is 9.4 mgd. These future system-wide flows were calculated by the collection system computer model using projected land use and population values. These flow values do not include stormwater flows that enter the

system periodically when the operators divert flow to the sanitary system as allowed by the WPCF discharge permit.

Modeling Analysis

A hydraulic model of the sewer system was developed to analyze the collection system during dry weather conditions. The model included pipelines 10 inches or greater in diameter, except when smaller diameter pipelines were essential to complete connections within the system.

A major city investment, the collection system computer model provides for a reliable and comprehensive understanding of existing and projected requirements within the wastewater service area. With this investment, the city now has a tool that calculates the collection system infrastructure required to meet the planning criteria adopted by the city. The model can be used on an ongoing basis to evaluate hydraulic impacts to the system caused by proposed developments. It is anticipated that city planners, engineers, and operations staff will all find value in the use of the model to evaluate proposed improvements and problem areas.

The software package used for the model is commercially available and is commonly used in the industry. The geographic information system (GIS) interface used with the model is compatible with other mapping, CAD, and pipeline condition assessment software used by the city.

The system modeling results showed that the city has no significant existing deficiencies, an uncommon finding for planning efforts of this kind. Redmond benefits from its climate and the integrity of the existing system--two factors that reduce infiltration and inflow. In communities where wet weather causes substantial flow increases in the collection system, capital improvement plans often include major capital expenditures for addressing deficiencies and planning for growth. Additionally, conservative design criteria used for planning and design of the existing system has proven to be good insurance that is now paying dividends in the lack of required upgrades.

The future collection system model was sized using the historically observed wastewater flow generation value of 80 gpcd, and was also run at a more conservative 120 gpcd as a sensitivity analysis to evaluate performance. The future system was seen to operate without overflows even under the more conservative 120 gpcd, which provides the city with additional confidence that the proposed improvements will meet design criteria with a reasonable factor of safety.

The design criteria used for evaluation of the existing and new system are summarized as follows:

- **Calibration data.** Flow monitoring data collected by the city were used to calibrate the existing conditions model, which was then modified for future conditions.
- **Land use and associated hydraulic loading**. Wastewater flow generation (gallons per acre per day) was based on land use types.
- **Population in service area.** Portland State University population projections were used for the service area.

- **Hydraulic criteria (minimum pipe slopes; "full-flow" and velocity criteria).** Minimum pipe slopes per City of Redmond standards were used, with new minimum pipe slopes developed for larger-diameter pipelines that were not covered by the standards (27-, 30-, and 36-inch diameter sizes). All pipes were sized to convey the peak flow at 80 percent full. In gravity sewers, the minimum slope and pipe diameter were selected to maintain 2 feet per second under full flow conditions. Force mains were sized for minimum velocity of 3 feet per second under peak design flows.
- **Pump station design criteria.** The city's pump station design criteria were modified during the course of this planning project. The new criteria adopted during this plan are the use of wet wells with a 60-minute storage volume under peak flow conditions. The 60-minute duration allows time for crews to respond to equipment failures.

Alternative Analysis

The topography of the Redmond wastewater service area is suitable for gravity sewer service using interceptors that cover the entire UGB and URA. It is expected that some existing local and regional pump stations will be required to continue discharge into some of these interceptors, but several pump stations can be removed from service after the interceptors are constructed. The approach for planning major conveyance facilities in this master plan was to rely on gravity interceptors in lieu of large pump stations with shallow force mains. This approach is the city's preference, has been used successfully to date, and was favorable in the present worth analyses.

In one area of the far west interceptor (near W Antler Avenue and NW Maple Avenue), a cost-benefit analysis was performed to compare a relatively deep gravity interceptor with a lift station and shallow force main. The intent of such an analysis was to determine if the lower capital cost and higher operating costs of the pump station (and shallow force main) offset the higher capital cost of a deep gravity interceptor. Using the methods described in the master plan, the gravity interceptor option at this deep excavation location pays off in a reasonable timeline and is the recommended approach.

For all other conveyance alternatives, the main alternative analysis was in the optimization of the vertical and horizontal alignment to provide the required service with the least excavation required. City engineering staff provided significant input and helped to provide the final alignment with their knowledge of the local topography and land use.

Recommended Improvements

To allow for growth and increased flows in the collection system, four interceptor projects were recommended as a result of the hydraulic modeling and planning assumptions made during this course of work. Layout of the interceptors was based on existing available mapping, and refinement of the alignments was performed through iterations with city engineering staff. These four recommended projects consist of the following:

- Westside interceptor (partially constructed as of 2007)
- Eastside interceptor (partially constructed as of 2007)
- Far west interceptor
- Far east interceptor

Capital Improvements Plan

A capital improvements plan (CIP) was prepared identifying these interceptor projects and several other smaller projects to meet the required wastewater collection system needs. These projects are broken down into discrete segments and costs prepared based on installed depth, blasting requirements, pipe size, surface restoration, and other factors described in the costing methodology section of this master plan.

The priority for implementation of these recommended improvements is noted for each segment in Appendix C. Nearly all recommended projects are growth-driven, so city planners and engineers will need to regularly evaluate sewer service requirements for proposed development. Use of the sewer model on an ongoing basis will be useful in evaluating alternatives and assessing the existing system. A number of projects are required to meet buildout condition flows. No immediate or 5-year deficiencies are identified in the model, although it is recognized that the model does not include many small local sewers that might have capacity issues. For these local sewers, it is recommended that collections staff monitor and identify potential capacity issues through the ongoing inspection program and community reports.

The eastern URA is outside the UGB, but planning was performed to develop concepts for how this area may be provided with sewer service. The far east interceptor will be the primary means of providing sewer service to the eastern URA.

The majority of the west side URA is included in the 2006 UGB expansion. A northwest portion of the URA will require pumping to the far west interceptor.

The costing approach for wastewater projects is intended to provide overall project costs (including engineering, construction, and city administration) and is based on a rigorous costing methodology developed and validated by the City of Portland Bureau of Environmental Services. The worksheet tool prepared for this master plan can be updated by city staff to reflect the impact of updated construction cost indices, current bid climate, and recently observed bid values. The costs developed in this report are based on an *Engineering News-Record* Seattle Construction Cost Index for January 2007 of 8626.

TV Inspection Program

Television inspection of the entire collection system is recommended to monitor condition and to guide operations and maintenance (O&M) activities and future planning evaluations. Development of a recurring TV inspection program, coupled with the city's new Granite XP asset management software, will allow more effective deployment of O&M resources and is expected to improve service.

City Flow Monitoring Plan

A city-wide flow monitoring plan is recommended to identify the most beneficial locations for deployment of continuous flow monitoring devices. The city's current practice of maintaining and collecting the flow monitor data has been generally acceptable for the modeling effort conducted for this master plan, but additional rigor could be added to the flow monitoring process. A rain gauge with recording capability is recommended to be located at City Hall and at the WPCF.

SECTION 7-1-B: WPCF UPDATE, CHAPTER 5

CHAPTER 5

ANALYSES FOR BUILDOUT CONDITIONS

Long-term planning for the build-out condition for the City of Redmond (City) Water Pollution Control Facility (WPCF) is included in this Chapter. Build-out population could occur as soon as 2030. Based on the density of the newly expanded UGB, the City estimates an UGB build-out population of 58,000 that will be reached in 2030.

FACILITY PLANNING PROCESS

The Water Pollution Control Facility (WPCF) Final Draft Facilities Plan Update, published in November 2004, covered a 20-year planning horizon to 2025. The Final Draft Facilities Plan Update was submitted to the Oregon Department of Environmental Quality (DEQ) for their review in November 2004. DEQ asked that the City wait to finalize the Facility Plan Update until after the WPCF permit was re-issued and the effluent requirements established by the permit. The WPCF permit was signed into effect on October 7, 2005. The City has been using the Final Draft Facilities Plan Update dated November 2004 to guide its Capital Improvement Plan and first expansion. A draft WPCF Modification Predesign Report for the first expansion to meet the wastewater treatment needs in 2010 was submitted to the City in February 2007. The Redmond WPCF Modifications Predesign Report contains the predesign analysis and recommendations for the 2010 improvements. The 2010 planned improvements are included in the implementation plan through 2030.

During the WPCF facilities planning process, the City developed Wastewater (Collection System) and Water System Master Plan (December 2007) for improving and expanding the water distribution system and the collection system portion of the wastewater system through to a 2030 build-out of the current UGB for a population of 58,000. To be consistent with the Wastewater (Collection System) and Water System Master Plan, the WPCF Facilities Plan Update includes an analysis of the 2030 planning period and the recommended improvements to meet projected 2030 flows and loads. It recommends capital improvements to guide expansion of the WPCF to meet urban growth boundary (UGB) buildout, which is expected to occur in 2030.

POPULATION

As noted in the Wastewater (Collections System) and Water System Master Plan, the UGB buildout population is 58,000 in 2030. The City added approximately 2,000 acres to the UGB in 2006 and created the Urban Reserve Area (URA) totaling 5,600 acres. The June 2004 EcoNW study for Redmond ("Findings in Support of Population Forecast") estimated annual city population growth rates of 3.97 percent for 2005 through 2025 and then 2.20 percent for 2026 through 2055. However, the City revised the build-out UGB population and time period to build-out following the expansion of the UGB in 2007. Based on the density of the newly expanded UGB, the City now estimates a UGB build-out population of 58,000 and that this will be reached in 2030.

FLOWS AND LOADS PROJECTIONS

The design criteria for the 2030 facilities include wastewater flows and loads within the UGB. The flows and Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) load projections are summarized in Tables 5-1 and 5-2. These are based on Redmond WPCF records for January 2001 through December 2003.

Table 5-1. Summary of Flow Projections (Data set January 2001 through December 2003)

Flows, million gallons per day (mgd)	2005	2010	2015	2020	2025	2030
Minimum month	2.03	2.62	3.27	3.86	4.43	5.45
Maximum month	2.44	3.15	3.93	4.64	5.33	6.55
Average month	2.20	2.84	3.55	4.19	4.81	5.92
Maximum day	3.02	3.90	4.87	5.75	6.60	8.12
Peak hour (influent)	4.88	6.30	7.87	9.28	10.66	13.11/9.4[2]
Peak 4-hour effluent	4.95	---[1]	---[1]	---[1]	---[1]	---[1]

[1] Peak hour effluent will be less than peak hour influent after new 2010 aeration modifications using variable frequency drives rather than water level for dissolved oxygen control.

[2] The Wastewater (Collection System) and Water System Master Plan (2007) peak hour flow projection for 2030 is 9.4 mgd and for the total of the UGB and the URAs is 12.6 mgd.

Table 5-2. Summary of Monthly Load Projections (Data set January 2001 through December 2003)

	2005	2010	2015	2020	2025	2030
BOD, pounds per day (ppd)						
Average	6,464	8,348	10,421	12,294	14,127	17,371
Winter maximum	8,866	11,451	14,294	16,864	19,378	23,827
Summer maximum	8,260	10,668	13,317	15,712	18,053	22,198
TSS, ppd						
Average	4,591	5,929	7,401	8,732	10,033	12,337
Winter maximum	7,547	9,746	12,167	14,354	16,494	20,281
Summer maximum	6,148	7,940	9,912	11,694	13,437	16,523

An analysis of January 2004 through December 2006 WPCF influent data was conducted to compare with the data set used for flow projections (January 2001 through December 2003) that were used in the original analysis for projections through 2025. For comparison, the BOD and TSS projections are listed in Table 5-3.

Because the January 2001 through December 2003 data is more conservative for planning parameters such as winter maximum month BOD (for secondary treatment) and to be consistent with the planning through 2025, the January 2001 through December 2003 data set is used for the 2030 flow and load projections.

Table 5-3. Summary of Monthly Load Projections (Data set January 2003 through December 2006) for comparison

	2005	2010	2015	2020	2025	2030
BOD, ppd						
Average	6,880	8,886	11,092	13,087	15,037	18,490
Winter maximum	8,379	10,822	13,509	15,938	18,313	22,518
Summer maximum	7,747	10,005	12,490	14,735	16,931	20,819
TSS, ppd						
Average	5,060	6,535	8,158	9,625	11,059	13,599
Winter maximum	5,837	7,539	9,411	11,103	12,758	15,687
Summer maximum	5,888	7,604	9,493	11,200	12,869	15,824

Per Capita Flows

Based on the trend chart of per capita flows shown in Figure 5-1, it appears that the per capita contribution (that includes the industrial contribution) to flow is declining, most likely a result of conservation. If conservation could be sustained at 80 gallons per capita per day and the relative industrial contribution stays consistent, then the build-out flows would be more in line with the flow projections for 2025. The Facilities Plan projections for 2025 are similar to the Wastewater (Collection System) and Water System Master Plan projections for buildout.

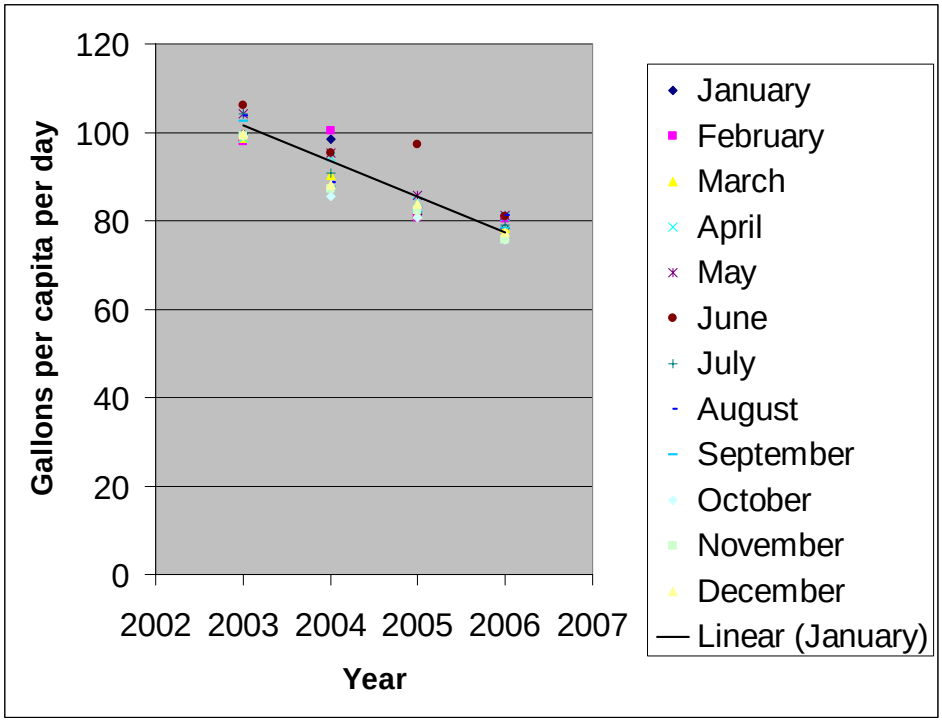


Figure 5-1. Per Capita Flow Contribution (Data set January 2003 through December 2006)

Peak Flow

The Wastewater (Collection System) and Water System Master Plan reviewed the peak flow data. Redmond WPCF influent flow data from January 2000 to September 2006 were reviewed for indications of rainfall-derived infiltration and inflow. Annual precipitation in the area is about 8.8 inches. The nearest source of available rainfall data is the Roberts Field-Redmond Municipal Airport, which is located 2 miles southeast of downtown Redmond. The Redmond WPCF influent flow data records showed no discernible rainfall response except for an exceptional event in June 2006. The peak influent flow recorded in 2006 was 9.6 mgd during a storm event on June 13. This event started at about 1:45 p.m. with flows climbing to the peak at about 3:50 p.m. and returning to normal (about 2 mgd) at 11:30 p.m. The elevated flows are associated with direct-valved connections between the stormwater system and the sanitary system.

It is understood that these connections will he limited or removed in the future. Recently (August 30, 2007), a peak flow of over 5 mgd was recorded at the WPCF as a result of an intense thunderstorm and the cross connections. Since the majority of the cross-connections are expected to be eliminated within 5 years, and the cross-connections will be removed by 2030, the 2006 rain-related events were not used in the peak flow calculations for the Wastewater (Collection System) and Water System Master Plan. The Wastewater (Collection System) and Water System Master Plan peak hour flow projection for 2030 is 9.4 mgd and for the total of the UGB and the URA (target year) is 12.6 mgd.

There were storm-flow connections in the 2001 through 2003 data set that were used for peak flow calculations for the WPCF Facilities Plan Update analysis. Therefore, the WPCF Facilities Plan Update peak hour flow projections are conservative. Flow and load projections should always be updated before any major plant expansion.

Per Capita Loadings

For 2003, the average BOD unit load is 0.36 pounds per capita per day (pcd). For the period of record, 2001 through 2003, the average unit load was 0.3 pcd. For the period of record, 2001 through 2003, the cold weather maximum month unit load was 0.41 pcd. For the period of record, 2003 through 2006, the average unit load was 0.32 pcd. For the period of record, 2003 through 2006, the maximum month cold weather unit load was 0.39 pcd. Because the January 2001 through December 2003 is more conservative for the planning parameters such as winter maximum month BOD for secondary treatment, the January 2001 through December 2003 data set is used for the 2030 load projections.

Ammonia

Ammonia concentration in average domestic wastewater is typically about 25 milligrams per liter (mg/L). The maximum ammonia concentration historically recorded is 65 mg/L. Historical ammonia concentrations in plant influent generally do not exceed 50 mg/L. Data collected at the plant for the period of record 2001 through 2003 indicate an average influent of about 32 mg/L. The average of the values for the period of record, 2003 through 2006 is 36 mg/L. The model was calibrated with the actual plant data.

Total Nitrogen

Average recorded Total Kjeldahl Nitrogen (TKN) is a method of analysis for measuring organic nitrogen. The average of the values for the period of record, 2001 through 2003 is 40 mg/L. The average of the values for the period of record, 2003 through 2006 is 50 mg/L. The value used in the secondary treatment model analysis is 50 mg/L TKN.

Waste Activated Sludge Production

The projected average waste activated sludge production for 2030 conditions is 14,300 pounds per day based on the secondary process model and solids output. This is used for solids treatment capacity analysis.

RECOMMENDATIONS FOR 2030

No additional alternatives analysis was conducted for the 2030 condition. It was assumed that the same technology chosen to be used through 2025 would be expanded for build-out. Future facilities planning should re-evaluate this assumption as technology improves. The recommendations are based on the population and flow and load projections for 2030.

Headworks

The headworks channels can pass the peak hour flow projection of 10.66. The headloss through the screens is projected to exceed the design headloss at a projected peak flow of 13.11 mgd. Channel modifications to increase the allowable headloss will need to be implemented and an additional channel and screen may need to be added to accommodate the projected peak hour flow of 13.11 mgd based on the stated headloss from the screen manufacturer. In addition, flow splitting to an additional oxidation ditch may be required for the potential future permit conditions.

Secondary Treatment and Tertiary Treatment

The secondary treatment improvements for 2030 are summarized in Table 5-4 for the current and potential permit requirements:

- Current Permit Condition: to meet 9 mg/L TN (and 20 mg/L for both BOD and TSS)
- Potential Future Permit Condition: to meet 6 mg/L total nitrogen (TN) (and 10 mg/L for both BOD and TSS)

Table 5-4. Recommended Secondary Treatment Upgrades Under Two Permit Conditions

Permit condition	Recommended upgrades
Current	A fifth Orbal unit or MBR treatment (near 2030)
Potential future	A fifth Orbal unit or membrane bioreactor (MBR) treatment (near 2030) Filtration or MBR treatment

Disinfection

Additional disinfection capacity would need to be added based on increased flow and associated disinfection detention time reduction in the contact basin. Either the detention time would need to be expanded or ultraviolet disinfection could be added to provide additional treatment for the increased flow. It is assumed that ultraviolet disinfection would be expanded.

Outfall Conveyance

The two 24-inch outfalls have the hydraulic capacity to convey the peak flow of 13.11 mgd under gravity conditions. The second outfall is designed as a pressure pipe to convey the peak flow of 13.11 if the first (older) pipeline needs to be taken out of service.

Infiltration Basins

The four infiltration basins are expected to have capacity of about 4.98 mgd maximum month flow at a design infiltration rate of 2.0 mgd per acre. Additional infiltration basin capacity will be needed to meet 2023 projected flows. The design of the basins for 2023 flows can be sized to handle the flows for 2030 or the infiltration capacity can be phased. For this analysis, it is assumed that the infiltration basin for 2023 flows will accommodate the 2030 flows as well.

Filtration

Filtration is not required to meet current permit limits. Filtration would likely be required to minimize the risk of not meeting potential future permit conditions of 10 mg/L of both BOD and TSS.

Reuse

Additional reuse could be implemented at any time. More land would be needed to expand the Level II reuse program as currently operated. Additional treatment would be needed to upgrade to Level IV treatment. Level IV treatment would allow reuse opportunities with less end use restrictions.

Biosolids

The solids equipment is assumed to be replaced in 2020 as it will be nearing the end of its expected useful life. It will also need to be expanded to meet the 2030 needs. The WAS capacity currently is

10,000 pounds per day and will need to be expanded to 14, 300 pounds per day capacity for 2030. Addition of a dryer would minimize the solids expansion needs as it would reduce the total quantity of solids to be handled. It would also produce Class A biosolids that would allow unrestricted use of the dried solids.

PHASED EXPANSION TO 2030

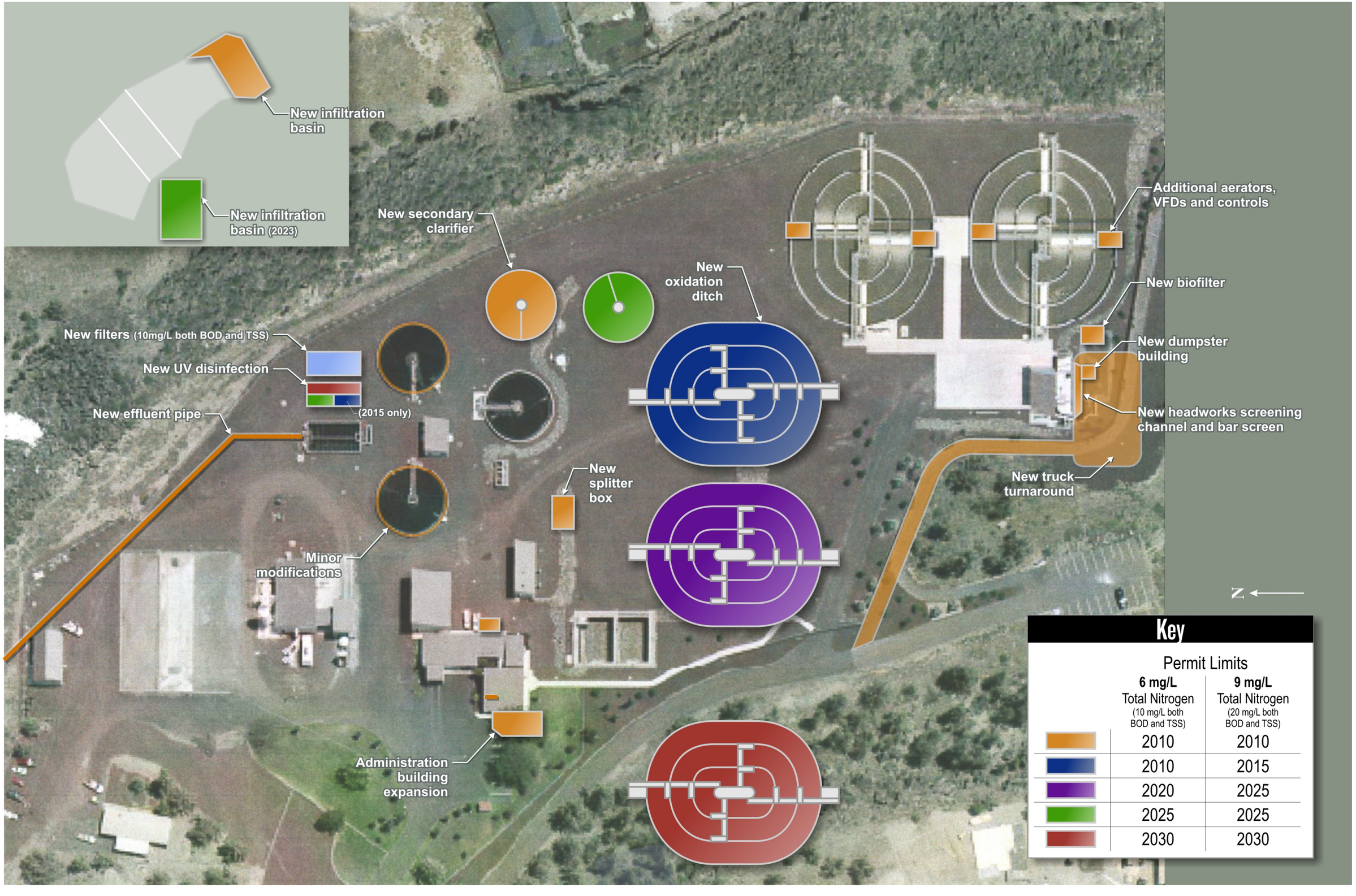
Recommendations for phasing improvements from 2010 to 2030 are summarized below. Figure 5-2 shows a site plan of the phased improvements to 2030 under both permit conditions.

Phased Improvements to Meet 9 mg/L TN Limits

The improvements recommended to meet growth and current permit limits of 9 mg/L TN, 20 mg/L BOD, and 20 mg/L TSS in phases from 2015 to 2030 are listed in Table 5-5.

Table 5-5. Phased Improvements from 2010 to 2030 to Meet Current Permit Conditions (9 mg/L TN Limits and 20 mg/L for both BOD and TSS)

Item	2015	2020	2025	2030
Headworks		Grit removal system (Optional)		Modify hydraulics
Secondary biological treatment	Oxidation ditch and return activated sludge (RAS) control improvements		Oxidation ditch	Oxidation Ditch (near 2030)
Secondary clarifiers			Secondary clarifier	
Filtration				
Disinfection	UV		UV	UV
Solids handling		Upgrade solids storage, replace equipment, and add dryer- why is dryer needed?		2020 improvements sized for 2030 capacity.
Infiltration basins			Additional infiltration	
Reuse	Potential	Potential	Potential	Potential


New infiltration basin
New infiltration basin (2023)
New secondary clarifier
New oxidation ditch
Additional aerators, VFDs and controls
New biofilter
New dumpster building
New headworks screening channel and bar screen
New truck turnaround
New filters (10mg/L both BOD and TSS)
New UV disinfection
(2015 only)
New effluent pipe
New splitter box
Minor modifications
Administration building expansion
N
Key
Permit Limits
6 mg/L Total Nitrogen (10 mg/L both BOD and TSS)
9 mg/L Total Nitrogen (20 mg/L both BOD and TSS)
2010
2010
2010
2015
2020
2025
2025
2025
2030
2030

The phased improvements recommended to meet growth (shown as flow and population) and current permit limits of 9 mg/L TN, 20 mg/L BOD, and 20 mg/L TSS are shown in Figure 5-3.

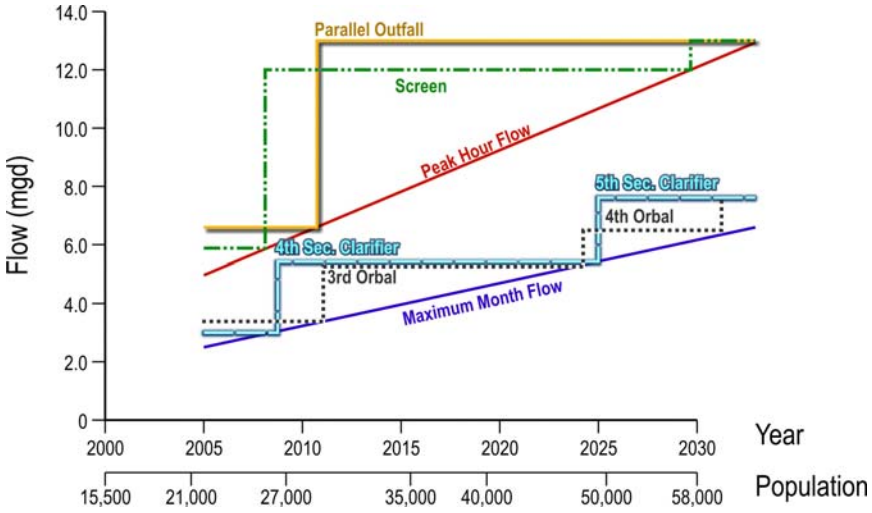


Figure 5-3. Phased Improvements based on Growth and to Meet Current Permit Requirements for 9 mg/L TN

Phased Improvements to Meet Potential Future Permit Conditions (6 mg/L TN and 10 mg/L for both BOD and TSS Limits)

The phased improvements at the Redmond WPCF for 2015 through 2030 are summarized in Table 5-6 for potential future permit conditions to meet 6 mg/L TN (and 10 mg/L for both BOD and TSS).

Table 5-6. Phased Improvements from 2015 to 2030 to Meet Potential Future Permit Conditions

Item	2015	2020	2025	2030
Headworks		Grit removal system		Modify hydraulics
Secondary biological treatment	Oxidation ditch and RAS control improvements	Oxidation ditch		Oxidation ditch (near 2030)
Secondary clarifiers			Secondary clarifier	
Filtration	Filtration-			Filtration-
Disinfection	UV		UV	UV
Solids handling		Upgrade solids storage, replace equipment, and add dryer		2020 improvements sized for 2030 capacity.
Infiltration basins			Additional infiltration basins	
Reuse	Potential	Potential	Potential	Potential

The phased improvements recommended to meet growth (shown as flow and population) and potential future permit limits of 6 mg/L TN, 10 mg/L BOD, and 10 mg/L TSS are shown in Figure 5-4.

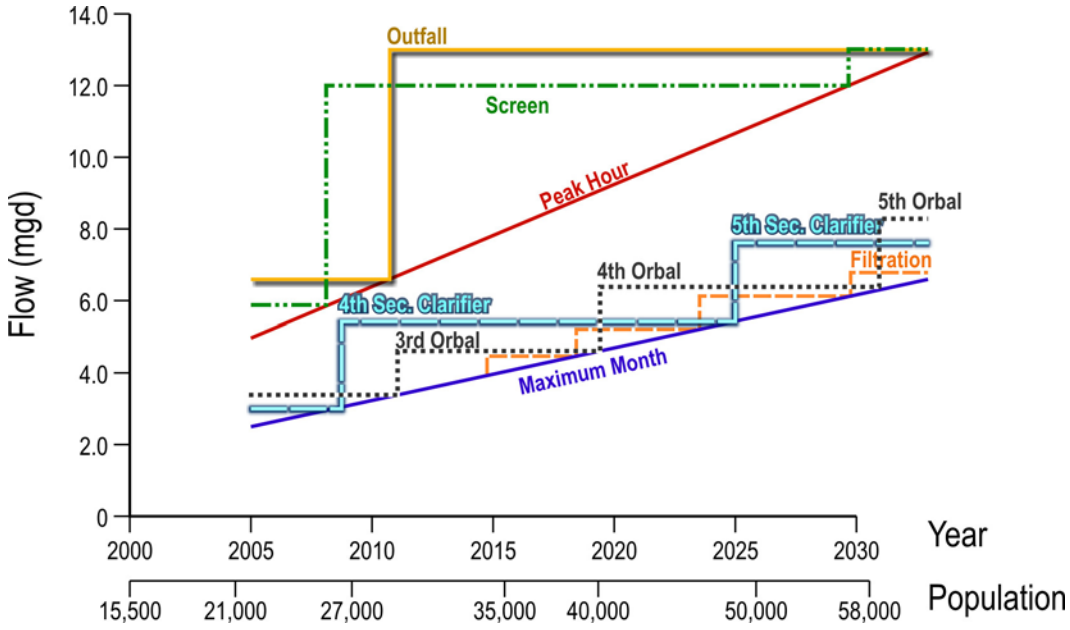


Figure 5-4 Phased Improvements based on Growth and to Meet Potential Future Permit Requirements for 6 mg/L TN

COST ESTIMATES

The cost estimate for the improvements to meet growth to 2030 and the current permit conditions (9 mg/L TN; 20 mg/L each for both BOD and TSS) is listed in Table 5-7. These order-of-magnitude costs are in November 2007 dollars.

The cost for phased improvements to meet growth to 2030 and potential future permit limits (6 mg/L TN; 10 mg/L each for both BOD and TSS) is listed in Table 5-8.

Table 5-7. Phased Costs for Current Permit Conditions (November 2007 dollars)

Item	Immediate improvements, dollars	Phase 2 2010, dollars	2015, dollars	2020, dollars	2025, dollars	2030, dollars	Reuse for 1 mgd, dollars	Subtotal	Discussion
Headworks								4,186,970	
Add screening	1,965,407					1,000,000			
Grit removal and washing				642,761					
New dumpster building	266,363								
MCC/electrical building modifications/storage	23,032								
Headworks odor control	289,407								
Bar screen solids removal	37,343	556,000						593,343	
Collection system influent piping improvements	108,667							108,667	
Secondary treatment aeration controls								28,121,421	
Additional aerators	1,519,589								
New oxidation ditch			8,727,559		8,727,560	*8,727,560*			*$8,727,560* near 2030 for fifth oxidation ditch
RAS controls improvements	69,153		350,000						
New secondary clarifier splitter structure	442,684							443,000	
Secondary clarifiers								5,423,000	
Secondary clarifier rehabilitation	306,790								
New secondary clarifier	2,133,569				2,806,972				For peak flow- not needed for load
RAS pumps	175,604								
Disinfection	384,241							4,934,241	
ORP, mixers, and baffle replacement									
Chlorine contact expansion									
UV			1,850,000		1,500,000	1,200,000			High-rate disinfection effective to ≤6 mgd; conservative phasing in 2015
Conveyance 24-inch pipeline	4,808,600							4,808,600	

Table 5-7. Phased Costs for Current Permit Conditions (November 2007 dollars (continued)

Item	Immediate improvements, dollars	Phase 2 2010, dollars	2015, dollars	2020, dollars	2025, dollars	2030, dollars	Reuse for 1 mgd, dollars	Subtotal	Discussion
Solids handling									
Solids measures for odor control								5,386,000	
Upgrade existing solids storage				1,000,496					
Solids equipment replacement				1,212,323					
Add dryer for Class A and reduced solids quantity				3,173,611					.Dryer for 2020
Infiltration basin								703,600	
Rehabilitate existing basins (completed)									
Add infiltration Basin No. 4	170,000								
Add infiltration Basin No. 5				533,600					Additional land area needs to be identified .at a different elevation.
Administration building expansion		779,000						779,000	Assumes 29 staff in 2030, expanded lockers, lunchroom, break-room/training; five additional offices
Add irrigation Level IV (1.0 mgd)								4,953,264	Assumes keeping Level II at current capacity and adding 1.0 mgd of Level IV at plant.
Coagulation/filtration							2,322,023		Filtration instead of secondary clarifier addition- can be used for Level IV reuse
Pump Station							811,125		
Chlorine contact modifications for Level IV							276,613		
Conveyance to COID (1.1 miles)							1,543,502		Share cost with COID?
Subtotal construction	12,700,000	1,335,000	10,928,000	6,563,000	13,035,000	10,928,000	4,953,000	60,441,000	
Engineering and administration at 30 percent	3,810,000	401,000	3,278,000	1,968,900	3,910,000	3,278,400	1,486,000	18,132,300	
Total capital cost	**16,510,000**	**1,736,000**	**14,206,000**	**8,531,900**	**16,945,000**	**14,206,400**	**6,439,000**	**78,573,300**	

Table 5-8. Phased Costs for Potential Future Permit Conditions (November 2007 dollars)

Item	Immediate improvements, dollars	Phase 2 2010, dollars	2015, dollars	2020, dollars	2025, dollars	Buildout 2030, dollars	Reuse for 1 mgd, dollars	Subtotal	Discussion
Headworks								4,187,000	
Add screening	1,965,407					1,000,000			
Grit removal and washing				642,761					
New dumpster building	266,363								
MCC/electrical building modifications/ storage	23,032								
Headworks odor control	289,407								
Bar screen solids removal	37,343	556,000	768,985					1,362,000	
Collection system influent piping improvements	109,000							109,000	
Secondary treatment aeration controls	1,519,589							28,121,000	
Additional aerators									
New oxidation ditch				8,727,559	8,727,560	8,727,560			2030–Another oxidation ditch is required or go to MBR
RAS controls improvements	69,153		350,000						
New secondary clarifier splitter structure	442,684							443,000	
Secondary clarifiers								5,423,000	
Secondary clarifier rehabilitation	306,790								
New secondary clarifier	2,133,569				2,806,972				2030–Another oxidation ditch and clarifier is required or go to MBR
RAS pumps	175,604								
Filtration (1.84 mgd)			3,715,239			3,789,544		7,504,800	2030–Not required with MBR
Disinfection	384,241							4,934,000	
ORP, mixers, and baffle replacement									
Chlorine contact expansion									
UV			1,850,000		1,500,000	1,200,000			High-rate disinfection effective to ≤ 6 mgd; conservative phasing in 2015
Conveyance 24-inch pipeline	4,808,600							4,808,600	

Table 5-8. Phased Costs for Potential Future Permit Conditions (November 2007 dollars), continued

Item	Immediate improvements, dollars	Phase 2 2010, dollars	2015, dollars	2020, dollars	2025, dollars	Buildout 2030, dollars	Reuse for 1 mgd, dollars	Subtotal	Discussion
Solids handling									
Solids measures for odor control								5,386,000	
Upgrade existing solids storage				1,000,496					
Solids equipment replacement				1,212,323					
Add dryer for Class A and reduced solids quantity				3,173,611					Dryer for 2020.
Infiltration basin								703,600	
Rehabilitate existing basins (completed)									
Add infiltration Basin No. 4	170,000								
Add infiltration Basin No. 5				533,600					Additional land area needs to be identified and most likely will be at a different elevation.
Administration building expansion		779,000						779,000	Assumes 29 staff in 2030, expanded lockers, lunchroom, breakroom/training; five additional offices
Add irrigation Level IV (1.0 mgd)								4,953,000	Assumes keeping Level II at current capacity and adding 1.0 mgd of Level IV at plant.
Coagulation/filtration							2,322,023		Filtration instead of secondary clarifier addition- can be used for Level IV reuse
Pump Station							811,125		
Chlorine contact modifications for Level IV							276,613		
Conveyance to COID (1.1 miles)							1,543,502		Share cost with COID?
Subtotal construction	12,701,000	1,335,000	14,643,000	15,290,000	4,307,000	14,717,000	4,953,000	67,946,000	
Engineering and administration at 30 percent	3,810,135	401,000	4,392,900	4,587,000	1,292,000	4,415,100	1,486,000	20,383,800	
Total capital cost	**16,511,000**	**1,736,000**	**19,035,900**	**19,877,000**	**5,599,000**	**19,132,100**	**6,439,000**	**88,329,800**	

SECTION 7-2: WASTEWATER COLLECTIONS AND WPFC CAPITAL IMPROVEMENT PLANS

Wastewater Collection System CIP

Wastewater Collection System UGB Buildout Project List (Costs based on ENR CCI Seattle = 8626

						Allocations		Pipelines				"Local" 8-inch sewer cost, 10 feet deep	"Local" 8-inch sewer cost, 10 feet deep	Incremental Cost exceeding "local" sewer cost	Total Project Cost	Costs					Unit Price	Engin. & Admin.	Traffic Control unit price	Rock Excava- tion Unit Price	Found. Stabil.	CDF Fill	Trench Dewatering	Erosion Control	Tunneling Boring, Jacking	Land Acquis- ition	Utility relo- cation	Total Unit Price
Project Type	Implemen- tation Phase	Model ID	Improve- ment Description	Reason for Improve- ment	Priority	Upgrade Existing	Growth	Length (ft.)	Average Depth of Bury (ft.)	Diameter (in.)	Unit Price ($/ft)		Unit Price ($/ft)	Project Unit Price ($/ft)	Construc-tion	Allowance for Eng. & Admin.	Total Estimate	Growth Cost	Location		10%	per LF	per LF	per LF	per LF	per LF	per LF	per LF	per LF	per LF	per LF	
Far West Interceptor	2007-2015	Link943	Sewer	Growth	4	0%	100%	30	6	30	$262		$174	$436	$12,600	$1,400	$14,000	$14,000	Between Sterling Pointe Pump Station and Redmond Water Pollution Control Facility	$ 371	$37	$9	$9	$0	$0	$0	$10	$0	$0	$0	$ 436
	2007-2015	Link944	Sewer	Growth	4	0%	100%	33	6	30	$262		$174	$436	$13,500	$1,500	$15,000	$15,000	Between Sterling Pointe Pump Station and Redmond Water Pollution Control Facility	$ 371	$37	$9	$9	$0	$0	$0	$10	$0	$0	$0	$ 436
	2007-2015	Link677	Sewer	Growth	4	0%	100%	25	5	30	$262		$171	$433	$9,900	$1,100	$11,000	$11,000	Between Sterling Pointe Pump Station and Redmond Water Pollution Control Facility	$ 371	$37	$9	$6	$0	$0	$0	$10	$0	$0	$0	$ 433
	2007-2015	CFEI_54	Sewer	Growth	4	0%	100%	86	5	30	$262		$171	$433	$34,200	$3,800	$38,000	$38,000	Between Sterling Pointe Pump Station and Redmond Water Pollution Control Facility	$ 371	$37	$9	$6	$0	$0	$0	$10	$0	$0	$0	$ 433
	2007-2015	CFEI_53	Sewer	Growth	4	0%	100%	175	6	30	$262		$174	$436	$69,300	$7,700	$77,000	$77,000	Between Sterling Pointe Pump Station and Redmond Water Pollution Control Facility	$ 371	$37	$9	$9	$0	$0	$0	$10	$0	$0	$0	$ 436
	2007-2015	Link895	Sewer	Growth	4	0%	100%	230	12	30	$262		$371	$633	$131,400	$14,600	$146,000	$146,000	Parallel to NW Spruce Ave, west of Sterling Pointe Pump Station	$ 534	$53	$9	$27	$0	$0	$0	$10	$0	$0	$0	$ 633
	2007-2015	Link894	Sewer	Growth	4	0%	100%	136	19	30	$262		$495	$757	$92,700	$10,300	$103,000	$103,000	Parallel to NW Spruce Ave, east of NW 22nd St at Sterling Pointe Pump Station	$ 628	$63	$9	$47	$0	$0	$0	$10	$0	$0	$0	$ 757
	2007-2015	Link893	Sewer	Growth	4	0%	100%	400	18	30	$262		$492	$754	$271,800	$30,200	$302,000	$302,000	Parallel to NW Spruce Ave, east of NW 22nd St	$ 628	$63	$9	$44	$0	$0	$0	$10	$0	$0	$0	$ 754
	2007-2015	Link892	Sewer	Growth	4	0%	100%	400	20	30	$262	$104,776	$496	$758	$273,600	$30,400	$304,000	$199,224	Parallel to NW Spruce Ave, west of NW 22nd St	$ 626	$63	$9	$50	$0	$0	$0	$10	$0	$0	$0	$ 758
	2007-2015	Link891	Sewer	Growth	4	0%	100%	350	24	30	$262	$91,679	$508	$770	$243,000	$27,000	$270,000	$178,321	Parallel to NW Spruce Ave, east of Northwest Way	$ 626	$63	$9	$62	$0	$0	$0	$10	$0	$0	$0	$ 770
	2007-2015	Link890	Sewer	Growth	4	0%	100%	350	25	24	$262	$91,679	$435	$697	$220,500	$24,500	$245,000	$153,321	Parallel to NW Spruce Ave, east of Northwest Way	$ 557	$56	$9	$65	$0	$0	$0	$10	$0	$0	$0	$ 697
	2007-2015	Link889	Sewer	Growth	4	0%	100%	373	23	30	$262	$97,633	$505	$767	$257,400	$28,600	$286,000	$188,367	Parallel to NW Spruce Ave, east of Northwest Way	$ 626	$63	$9	$59	$0	$0	$0	$10	$0	$0	$0	$ 767
	2007-2015	cFWi_51	Sewer	Growth	4	0%	100%	330	21	30	$262	$86,440	$499	$761	$226,800	$25,200	$252,000	$165,560	Along Northwest Way, south of NW Spruce Ave	$ 626	$63	$9	$53	$0	$0	$0	$10	$0	$0	$0	$ 761
	2007-2015	Link888	Sewer	Growth	4	0%	100%	325	19	24	$262	$85,063	$418	$680	$198,900	$22,100	$221,000	$135,937	Parallel to and south of NW Spruce Ave, west of Northwest Way	$ 557	$56	$9	$47	$0	$0	$0	$10	$0	$0	$0	$ 680
	2007-2015	Link887	Sewer	Growth	4	0%	100%	325	15	24	$262	$85,063	$326	$588	$172,800	$19,200	$192,000	$106,937	Parallel to and south of NW Spruce Ave, west of Northwest Way	$ 485	$49	$9	$36	$0	$0	$0	$10	$0	$0	$0	$ 588
	2007-2015	Link886	Sewer	Growth	4	0%	100%	330	12	24	$262	$86,440	$278	$540	$161,100	$17,900	$179,000	$92,560	Parallel to and west of Northwest Way, south of NW Spruce Ave	$ 449	$45	$9	$27	$0	$0	$0	$10	$0	$0	$0	$ 540
	2007-2015	Link885	Sewer	Growth	4	0%	100%	330	14	24	$262	$86,440	$284	$546	$162,900	$18,100	$181,000	$94,560	Parallel to and west of Northwest Way, south of NW Spruce Ave	$ 449	$45	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 546
	2007-2015	Link884	Sewer	Growth	4	0%	100%	332	16	24	$262	$86,993	$329	$591	$177,300	$19,700	$197,000	$110,007	Parallel to and west of Northwest Way, south of NW Spruce Ave	$ 485	$49	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 591
	2007-2015	Link883	Sewer	Growth	4	0%	100%	317	14	24	$262	$83,035	$284	$546	$155,700	$17,300	$173,000	$89,965	Parallel to and south of NW Spruce Ave, west of Northwest Way	$ 449	$45	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 546
	2007-2015	Link882	Sewer	Growth	4	0%	100%	317	9	24	$262	$83,101	$144	$406	$116,100	$12,900	$129,000	$45,899	Parallel to and south of NW Spruce Ave, west of Northwest Way	$ 336	$34	$9	$18	$0	$0	$0	$10	$0	$0	$0	$ 406
	2007-2015	Link881	Sewer	Growth	4	0%	100%	330	7	24	$262	$86,440	$99	$361	$108,000	$12,000	$120,000	$33,560	Parallel to and east of NW 35th St, north of NW Maple Ave	$ 301	$30	$9	$12	$0	$0	$0	$10	$0	$0	$0	$ 361
	2007-2015	Link880	Sewer	Growth	4	0%	100%	330	8	24	$262	$86,440	$141	$403	$120,600	$13,400	$134,000	$47,560	Parallel to and east of NW 35th St, north of NW Maple Ave	$ 336	$34	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 403
	2007-2015	Link879	Sewer	Growth	4	0%	100%	330	11	24	$262	$86,440	$275	$537	$160,200	$17,800	$178,000	$91,560	Parallel to and east of NW 35th St, north of NW Maple Ave	$ 449	$45	$9	$24	$0	$0	$0	$10	$0	$0	$0	$ 537
	2007-2015	Link878	Sewer	Growth	4	0%	100%	330	15	24	$262	$86,440	$326	$588	$175,500	$19,500	$195,000	$108,560	Parallel to and east of NW 35th St, north of NW Maple Ave	$ 485	$49	$9	$36	$0	$0	$0	$10	$0	$0	$0	$ 588
	2007-2015	Link877	Sewer	Growth	4	0%	100%	330	17	24	$262	$86,440	$412	$674	$200,700	$22,300	$223,000	$136,560	Parallel to and south of NW Oak Ave, east of NW 35th St	$ 557	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 674
	2007-2015	Link876	Sewer	Growth	4	0%	100%	330	15	24	$262	$86,440	$326	$588	$175,500	$19,500	$195,000	$108,560	Parallel to and south of NW Oak Ave, east of NW 35th St	$ 485	$49	$9	$36	$0	$0	$0	$10	$0	$0	$0	$ 588
	2007-2015	Link875	Sewer	Growth	4	0%	100%	330	16	24	$262	$86,440	$329	$591	$176,400	$19,600	$196,000	$109,560	Parallel to and south of NW Oak Ave, east of NW 35th St	$ 485	$49	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 591
	2007-2015	cFWi_41	Sewer	Growth	4	0%	100%	330	17	27	$262	$86,440	$410	$672	$199,800	$22,200	$222,000	$135,560	Parallel to and south of NW Oak Ave, east from NW 35th St	$ 556	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 672
	2007-2015	Link874	Sewer	Growth	4	0%	100%	331	16	27	$262	$86,702	$343	$605	$180,900	$20,100	$201,000	$114,298	Along NW 35th St north of NW Maple Ave	$ 498	$50	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 605
	2007-2015	Link873	Sewer	Growth	4	0%	100%	340	19	27	$262	$89,060	$416	$678	$207,900	$23,100	$231,000	$141,940	Along NW 35th St north of NW Maple Ave	$ 556	$56	$9	$47	$0	$0	$0	$10	$0	$0	$0	$ 678
	2007-2015	Link900	Sewer	Growth	4	0%	100%	330	22	27	$262	$86,440	$489	$751	$223,200	$24,800	$248,000	$161,560	Along NW 35th St north of NW Maple Ave	$ 614	$61	$9	$56	$0	$0	$0	$10	$0	$0	$0	$ 751
	2007-2015	cFWi_40	Sewer	Growth	4	0%	100%	320	21	27	$262	$83,821	$486	$748	$216,000	$24,000	$240,000	$156,179	Along NW 35th St north of NW Maple Ave	$ 614	$61	$9	$53	$0	$0	$0	$10	$0	$0	$0	$ 748
	2016-2020	cNW_P2	Sewer	Growth	4	0%	100%	330	18	27	$262	$86,440	$413	$675	$200,700	$22,300	$223,000	$136,560	Along NW Maple Ave, west of NW 35th St	$ 556	$56	$9	$44	$0	$0	$0	$10	$0	$0	$0	$ 675
	2016-2020	Link901	Sewer	Growth	4	0%	100%	330	18	27	$262	$86,440	$413	$675	$200,700	$22,300	$223,000	$136,560	Parallel to and west of NW 35th St, south of NW Maple Ave	$ 556	$56	$9	$44	$0	$0	$0	$10	$0	$0	$0	$ 675
	2016-2020	cFWi_38	Sewer	Growth	4	0%	100%	240	20	27	$262	$62,866	$419	$681	$147,600	$16,400	$164,000	$101,134	Parallel to and west of NW 35th St, south of NW Maple Ave	$ 556	$56	$9	$50	$0	$0	$0	$10	$0	$0	$0	$ 681
	2016-2020	cFWi_37	Sewer	Growth	4	0%	100%	330	16	27	$262	$86,440	$407	$669	$198,900	$22,100	$221,000	$134,560	Parallel to and south of NW Maple Ave, west of SW 35th St	$ 556	$56	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 669
	2016-2020	Link903	Sewer	Growth	4	0%	100%	330	13	27	$262	$86,440	$302	$564	$168,300	$18,700	$187,000	$100,560	Parallel to and west of NW 35th St, south of NW Maple Ave	$ 468	$47	$9	$30	$0	$0	$0	$10	$0	$0	$0	$ 564
	2016-2020	Link902	Sewer	Growth	4	0%	100%	330	17	27	$262	$86,440	$410	$672	$199,800	$22,200	$222,000	$135,560	Parallel to and west of NW 35th St, south of NW Maple Ave	$ 556	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 672
	2016-2020	cFWi_36	Sewer	Growth	4	0%	100%	90	22	27	$262	$23,575	$489	$751	$61,200	$6,800	$68,000	$44,425	Parallel to and west of NW 35th St, south of NW Maple Ave	$ 614	$61	$9	$56	$0	$0	$0	$10	$0	$0	$0	$ 751
	2016-2020	Link872	Sewer	Growth	4	0%	100%	240	19	27	$262	$62,866	$416	$678	$146,700	$16,300	$163,000	$100,134	Parallel to and west of NW 35th St, south of NW Hemlock Ave	$ 556	$56	$9	$47	$0	$0	$0	$10	$0	$0	$0	$ 678
	2016-2020	Link871	Sewer	Growth	4	0%	100%	330	13	27	$262	$86,440	$302	$564	$168,300	$18,700	$187,000	$100,560	Parallel to and west of NW 35th St, south of NW Hemlock Ave	$ 468	$47	$9	$30	$0	$0	$0	$10	$0	$0	$0	$ 564
	2016-2020	Link870	Sewer	Growth	4	0%	100%	330	13	27	$262	$86,440	$302	$564	$168,300	$18,700	$187,000	$100,560	Parallel to and west of NW 35th St, south of NW Hemlock Ave	$ 468	$47	$9	$30	$0	$0	$0	$10	$0	$0	$0	$ 564
	2016-2020	Link869	Sewer	Growth	4	0%	100%	320	13	27	$262	$83,821	$302	$564	$162,900	$18,100	$181,000	$97,179	Parallel to and west of NW 35th St, south of NW Hemlock Ave	$ 468	$47	$9	$30	$0	$0	$0	$10	$0	$0	$0	$ 564
	2016-2020	cFWi_35	Sewer	Growth	4	0%	100%	90	13	27	$262	$23,575	$302	$564	$45,900	$5,100	$51,000	$27,425	Parallel to and west of NW 35th St, south of NW Hemlock Ave	$ 468	$47	$9	$30	$0	$0	$0	$10	$0	$0	$0	$ 564
	2016-2020	Link868	Sewer	Growth	4	0%	100%	250	10	27	$262	$65,485	$233	$495	$111,600	$12,400	$124,000	$58,515	Parallel to and west of NW 35th St, south of NW Hemlock Ave	$ 414	$41	$9	$21	$0	$0	$0	$10	$0	$0	$0	$ 495
	2016-2020	Link867	Sewer	Growth	4	0%	100%	330	7	27	$262	$86,440	$160	$422	$126,000	$14,000	$140,000	$53,560	Parallel to and west of NW 35th St, south of NW Hemlock Ave	$ 355	$36	$9	$12	$0	$0	$0	$10	$0	$0	$0	$ 422
	2016-2020	cNW_2	Sewer	Growth	4	0%	100%	100	7	27	$262	$26,194	$160	$422	$38,700	$4,300	$43,000	$16,806	Parallel to and west of NW 35th St, south of NW Hemlock Ave	$ 355	$36	$9	$12	$0	$0	$0	$10	$0	$0	$0	$ 422
	2016-2020	Link866	Sewer	Growth	4	0%	100%	230	9	27	$262	$60,246	$231	$492	$102,600	$11,400	$114,000	$53,754	Parallel to and west of NW 35th St, south of NW Hemlock Ave	$ 414	$41	$9	$18	$0	$0	$0	$10	$0	$0	$0	$ 492
	2016-2020	Link865	Sewer	Growth	4	0%	100%	330	14	27	$262	$86,440	$305	$567	$169,200	$18,800	$188,000	$101,560	Parallel to and west of NW 35th St, north of W Antler Ave	$ 468	$47	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 567
	2016-2020	cFWi_33	Sewer	Growth	4	0%	100%	110	17	27	$262	$28,813	$410	$672	$66,600	$7,400	$74,000	$45,187	Parallel to and west of NW 35th St, north of W Antler Ave	$ 556	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 672
	2016-2020	Link864	Sewer	Growth	4	0%	100%	230	17	27	$262	$60,246	$410	$672	$139,500	$15,500	$155,000	$94,754	Parallel to and west of NW 35th St, north of W Antler Ave	$ 556	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 672
	2016-2020	Link863	Sewer	Growth	4	0%	100%	330	15	27	$262	$86,440	$340	$602	$179,100	$19,900	$199,000	$112,560	Parallel to and west of NW 35th St, north of W Antler Ave	$ 498	$50	$9	$36	$0	$0	$0	$10	$0	$0	$0	$ 602
	2016-2020	cFWi_32	Sewer	Growth	4	0%	100%	110	14	27	$262	$28,813	$305	$567	$56,700	$6,300	$63,000	$34,187	Parallel to and west of NW 35th St, north of W Antler Ave	$ 468	$47	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 567
	2016-2020	Link862	Sewer	Growth	4	0%	100%	220	17	24	$262	$57,627	$412	$674	$134,100	$14,900	$149,000	$91,373	Parallel to and west of NW 35th St, north of W Antler Ave	$ 557	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 674
	2016-2020	Link861	Sewer	Growth	4	0%	100%	330	21	24	$262	$86,440	$424	$686	$204,300	$22,700	$227,000	$140,560	Parallel to and west of NW 35th St, north of W Antler Ave	$ 557	$56	$9	$53	$0	$0	$0	$10	$0	$0	$0	$ 686

						Allocations		Pipelines			"Local" 8-inch sewer cost, 10 feet deep	"Local" 8-inch sewer cost, 10 feet deep	Incremental Cost exceeding "local" sewer cost	Total Project Cost	Costs																		
Project Type	Implemen-tation Phase	Model ID	Improve-ment Description	Reason for Improve-ment	Priority	Upgrade Existing	Growth	Length (ft.)	Average Depth of Bury (ft.)	Diameter (in.)	Unit Price ($/ft)		Unit Price ($/ft)	Project Unit Price ($/ft)	Construc-tion	Allowance for Eng. & Admin.	Total Estimate	Growth Cost	Location	Unit Price	Engin. & Admin.	Traffic Control unit price	Rock Excava- tion Unit Price	Found. Stabil.	CDF Fill	Trench Dewatering	Erosion Control	Tunneling Boring, Jacking	Land Acquis-ition	Utility relo-cation	Total Unit Price
																					10%	per LF	per LF	per LF	per LF	per LF	per LF	per LF	per LF	per LF	
	2016-2020	cFWi_31	Sewer	Growth	4	0%	100%	130	21	24	$262	$34,052	$424	$686	$81,000	$9,000	$90,000	$55,948	Parallel to and west of NW 35th St, north of W Antler Ave	$ 557	$56	$9	$53	$0	$0	$0	$10	$0	$0	$0	$ 686
	2016-2020	Link841	Sewer	Growth	4	0%	100%	410	20	24	$262	$107,396	$421	$683	$252,000	$28,000	$280,000	$172,604	Along W Antler Ave, west of SW 35th St	$ 557	$56	$9	$50	$0	$0	$0	$10	$0	$0	$0	$ 683
	2016-2020	Link840	Sewer	Growth	4	0%	100%	410	17	24	$262	$107,396	$412	$674	$249,300	$27,700	$277,000	$169,604	Along W Antler Ave, west of SW 35th St	$ 557	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 674
	2016-2020	Link844	Sewer	Growth	4	0%	100%	330	15	24	$262	$86,440	$326	$588	$175,500	$19,500	$195,000	$108,560	Parallel to and east of SW Helmholtz Way, south of W Antler Ave	$ 485	$49	$9	$36	$0	$0	$0	$10	$0	$0	$0	$ 588
	2016-2020	Link904	Sewer	Growth	4	0%	100%	330	15	24	$262	$86,440	$326	$588	$175,500	$19,500	$195,000	$108,560	Parallel to and east of SW Helmholtz Way, south of W Antler Ave	$ 485	$49	$9	$36	$0	$0	$0	$10	$0	$0	$0	$ 588
	2016-2020	Link843	Sewer	Growth	4	0%	100%	330	14	24	$262	$86,440	$284	$546	$162,900	$18,100	$181,000	$94,560	Parallel to and east of SW Helmholtz Way, south of W Antler Ave	$ 449	$45	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 546
	2016-2020	Link842	Sewer	Growth	4	0%	100%	330	12	24	$262	$86,440	$278	$540	$161,100	$17,900	$179,000	$92,560	Parallel to and east of SW Helmholtz Way, south of W Antler Ave	$ 449	$45	$9	$27	$0	$0	$0	$10	$0	$0	$0	$ 540
	2016-2020	Link860	Sewer	Growth	4	0%	100%	166	9	24	$262	$43,482	$144	$406	$61,200	$6,800	$68,000	$24,518	Parallel to and north of SW Highland Ave, east of SW Helmholtz Way	$ 336	$34	$9	$18	$0	$0	$0	$10	$0	$0	$0	$ 406
	2016-2020	Link859	Sewer	Growth	4	0%	100%	330	12	24	$262	$86,440	$278	$540	$161,100	$17,900	$179,000	$92,560	Parallel to and east of SW Helmholtz Way, north of SW Highland Ave	$ 449	$45	$9	$27	$0	$0	$0	$10	$0	$0	$0	$ 540
	2016-2020	Link858	Sewer	Growth	4	0%	100%	330	16	24	$262	$86,440	$329	$591	$176,400	$19,600	$196,000	$109,560	Parallel to and east of SW Helmholtz Way, north of SW Highland Ave	$ 485	$49	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 591
	2016-2020	Link857	Sewer	Growth	4	0%	100%	330	16	24	$262	$86,440	$329	$591	$176,400	$19,600	$196,000	$109,560	Parallel to and east of SW Helmholtz Way, north of SW Highland Ave	$ 485	$49	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 591
	2016-2020	Link856	Sewer	Growth	4	0%	100%	280	16	24	$262	$73,343	$329	$591	$149,400	$16,600	$166,000	$92,657	Parallel to and east of SW Helmholtz Way, north of SW Highland Ave	$ 485	$49	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 591
	2021-2025	Link855	Sewer	Growth	4	0%	100%	330	15	24	$262	$86,440	$326	$588	$175,500	$19,500	$195,000	$108,560	Along SW Highland Ave, east of SW Helmholtz Way	$ 485	$49	$9	$36	$0	$0	$0	$10	$0	$0	$0	$ 588
	2021-2025	Link854	Sewer	Growth	4	0%	100%	330	14	24	$262	$86,440	$284	$546	$162,900	$18,100	$181,000	$94,560	Along SW Highland Ave, east of SW Helmholtz Way	$ 449	$45	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 546
	2021-2025	Link853	Sewer	Growth	4	0%	100%	330	17	24	$262	$86,440	$412	$674	$200,700	$22,300	$223,000	$136,560	Parallel to and east of SW Helmholtz Way, south of SW Highland Ave	$ 557	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 674
	2021-2025	Link852	Sewer	Growth	4	0%	100%	330	18	24	$262	$86,440	$415	$677	$201,600	$22,400	$224,000	$137,560	Parallel to and east of SW Helmholtz Way, south of SW Highland Ave	$ 557	$56	$9	$44	$0	$0	$0	$10	$0	$0	$0	$ 677
	2021-2025	Link851	Sewer	Growth	4	0%	100%	330	17	24	$262	$86,440	$412	$674	$200,700	$22,300	$223,000	$136,560	Parallel to and east of SW Helmholtz Way, north of SW Obsidian Ave	$ 557	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 674
	2021-2025	Link850	Sewer	Growth	4	0%	100%	330	17	24	$262	$86,440	$412	$674	$200,700	$22,300	$223,000	$136,560	Parallel to and east of SW Helmholtz Way, north of SW Obsidian Ave	$ 557	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 674
	2021-2025	Link849	Sewer	Growth	4	0%	100%	330	17	24	$262	$86,440	$412	$674	$200,700	$22,300	$223,000	$136,560	Parallel to and east of SW Helmholtz Way, north of SW Obsidian Ave	$ 557	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 674
	2021-2025	Link848	Sewer	Growth	4	0%	100%	330	17	24	$262	$86,440	$412	$674	$200,700	$22,300	$223,000	$136,560	Parallel to and east of SW Helmholtz Way, north of SW Obsidian Ave	$ 557	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 674
	2021-2025	Link847	Sewer	Growth	4	0%	100%	330	18	24	$262	$86,440	$415	$677	$201,600	$22,400	$224,000	$137,560	Parallel to and east of SW Helmholtz Way, north of SW Obsidian Ave	$ 557	$56	$9	$44	$0	$0	$0	$10	$0	$0	$0	$ 677
	2021-2025	Link846	Sewer	Growth	4	0%	100%	380	19	24	$262	$99,537	$418	$680	$233,100	$25,900	$259,000	$159,463	Parallel to and east of SW Helmholtz Way, north of SW Obsidian Ave	$ 557	$56	$9	$47	$0	$0	$0	$10	$0	$0	$0	$ 680
	2021-2025	Link845	Sewer	Growth	4	0%	100%	805	22	24	$262	$210,862	$427	$689	$499,500	$55,500	$555,000	$344,138	Along SW Obsidian Ave, east of SW Helmholtz Way	$ 557	$56	$9	$56	$0	$0	$0	$10	$0	$0	$0	$ 689
	2021-2025	cFWi_18	Sewer	Growth	4	0%	100%	512	21	15	$262	$134,114	$222	$484	$223,200	$24,800	$248,000	$113,886	Along SW Obsidian Ave, west of SW Helmholtz Way	$ 374	$37	$9	$53	$0	$0	$0	$10	$0	$0	$0	$ 484
	2021-2025	cFWi_17	Sewer	Growth	4	0%	100%	660	14	15	$262	$172,881	$201	$463	$275,400	$30,600	$306,000	$133,119	Parallel to and approximately 3000 feet east of SW 55th St, south of SW Obsidian Ave	$ 374	$37	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 463
	2021-2025	cFWi_16	Sewer	Growth	4	0%	100%	660	14	15	$262	$172,881	$201	$463	$275,400	$30,600	$306,000	$133,119	Parallel to and approximately 3000 feet east of SW 55th St, south of SW Obsidian Ave	$ 374	$37	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 463
	2021-2025	cFWi_15	Sewer	Growth	4	0%	100%	633	11	15	$262	$165,808	$84	$346	$197,100	$21,900	$219,000	$53,192	Parallel to and approximately 2000 feet west of SW Quartz Ave	$ 275	$28	$9	$24	$0	$0	$0	$10	$0	$0	$0	$ 346
	2021-2025	cFWi_14	Sewer	Growth	4	0%	100%	1,280	8	15	$262	$335,284	$42	$304	$351,000	$39,000	$390,000	$54,716	Parallel to and approximately 3000 feet west of SW Quartz Ave	$ 246	$25	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 304
	2021-2025	cFWi_13	Sewer	Growth	4	0%	100%	1,320	10	15	$262	$345,762	$81	$343	$407,700	$45,300	$453,000	$107,238	Parallel to and east of SW 55th St, north of SW Wickiup Ave	$ 275	$28	$9	$21	$0	$0	$0	$10	$0	$0	$0	$ 343
	2021-2025	cWC_2	Sewer	Growth	4	0%	100%	1,320	9	15	$262	$345,762	$78	$340	$404,100	$44,900	$449,000	$103,238	Parallel to and east of SW 55th St, north of SW Wickiup Ave	$ 275	$28	$9	$18	$0	$0	$0	$10	$0	$0	$0	$ 340
	2021-2025	cFWi_11	Sewer	Growth	4	0%	100%	1,320	9	12	$262	$345,762	$63	$325	$387,000	$43,000	$430,000	$84,238	Along SW Helmholtz Way, north of SW Wickiup Ave	$ 262	$26	$9	$18	$0	$0	$0	$10	$0	$0	$0	$ 325
	2026-2030	cFWi_10	Sewer	Growth	4	0%	100%	1,320	17	12	$262	$345,762	$193	$455	$540,900	$60,100	$601,000	$255,238	Along SW Helmholtz Way, south of SW Wickiup Ave	$ 359	$36	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 455
	2026-2030	cFWi_9	Sewer	Growth	4	0%	100%	1,320	26	12	$262	$345,762	$263	$525	$624,600	$69,400	$694,000	$348,238	Along SW Helmholtz Way, north of SW Coyote Ave	$ 398	$40	$9	$68	$0	$0	$0	$10	$0	$0	$0	$ 525
	2026-2030	cFWi_8	Sewer	Growth	4	0%	100%	1,320	20	12	$262	$345,762	$246	$508	$603,000	$67,000	$670,000	$324,238	Along SW Helmholtz Way, north from SW Coyote Ave	$ 398	$40	$9	$50	$0	$0	$0	$10	$0	$0	$0	$ 508
	2026-2030	cFWi_7	Sewer	Growth	4	0%	100%	1,320	19	12	$262	$345,762	$243	$505	$599,400	$66,600	$666,000	$320,238	East from the terminus of SW Coyote Ave	$ 398	$40	$9	$47	$0	$0	$0	$10	$0	$0	$0	$ 505
	2026-2030	cFWi_6	Sewer	Growth	4	0%	100%	650	21	12	$262	$170,261	$249	$510	$298,800	$33,200	$332,000	$161,739	Parallel to and approximately 1300 feet east of SW Coyote Ave	$ 398	$40	$9	$53	$0	$0	$0	$10	$0	$0	$0	$ 510
	2026-2030	cSW_4	Sewer	Growth	4	0%	100%	1,320	17	12	$262	$345,762	$193	$455	$540,900	$60,100	$601,000	$255,238	Parallel to and east of SW Helmholtz Way, north of SW Elkhorn Ave	$ 359	$36	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 455
	2026-2030	Link838	Sewer	Growth	4	0%	100%	1,210	17	10	$262	$316,948	$192	$454	$495,000	$55,000	$550,000	$233,052	Along SW Elkhorn Ave, west of SW 39th St	$ 358	$36	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 454
	2026-2030	cFWi_4	Sewer	Growth	4	0%	100%	350	19	12	$262	$91,679	$199	$461	$145,800	$16,200	$162,000	$70,321	Parallel and west of SW 43rd St between SW Canal Blvd and SW Elkhorn Ave	$ 359	$36	$9	$47	$0	$0	$0	$10	$0	$0	$0	$ 461
	2026-2030	Link837	Sewer	Growth	4	0%	100%	778	17	10	$262	$203,790	$192	$454	$318,600	$35,400	$354,000	$150,210	Along SW Elkhorn Ave between SW 39th St and SW Canal Blvd	$ 358	$36	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 454
	2026-2030	Link839	Sewer	Growth	4	0%	100%	1,260	17	10	$262	$330,045	$192	$454	$515,700	$57,300	$573,000	$242,955	Along SW 39th St between SW Canal Blvd and SW Elkhorn Ave	$ 358	$36	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 454
	2026-2030	Link836	Sewer	Growth	4	0%	100%	1,350	17	10	$262	$353,620	$192	$454	$552,600	$61,400	$614,000	$260,380	East from SW Elkhorn Ave and SW 39th St	$ 358	$36	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 454
	2026-2030	cFWi_3	Sewer	Growth	4	0%	100%	655	16	10	$262	$171,571	$189	$451	$266,400	$29,600	$296,000	$124,429	Parallel to and south of SW Elkhorn Ave, west of SW Canal Blvd	$ 358	$36	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 451
	2026-2030	cFWi_2	Sewer	Growth	4	0%	100%	1,098	16	10	$262	$287,611	$189	$451	$446,400	$49,600	$496,000	$208,389	North from SW Canal Blvd, parallel to SW Helmholtz Way	$ 358	$36	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 451
	2026-2030	cFWi_1	Sewer	Growth	4	0%	100%	1,844	16	10	$262	$483,019	$189	$451	$748,800	$83,200	$832,000	$348,981	Along SW Canal Blvd, northeast of SW Helmholtz Way	$ 358	$36	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 451
								46,375				**$11,855,587**			**$22,021,200**	**$2,446,800**	**$24,468,000**	**$12,612,413**														
West Side Interceptor	2007-2015	WSI_613	Sewer	Growth	4	0%	40%	1,950	10	21	$262	$510,784	$69	$331	$582,300	$64,700	$647,000	$54,486	Along SW 27th Street, between SW Highland Avenue and SW Cascade Avenue	$ 265	$27	$9	$21	$0	$0	$0	$10	$0	$0	$0	$ 331
	2007-2015	SS17D073	Sewer	Growth	4	0%	40%	348	8	18	$262	$91,155	$53	$315	$99,000	$11,000	$110,000	$7,538	Along SW 27th Street, between SW Indian Ave and Juniper	$ 256	$26	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 315
	2007-2015	SS17D072	Sewer	Growth	4	0%	40%	120	8	18	$262	$31,433	$53	$315	$34,200	$3,800	$38,000	$2,627	Along SW 27th Street, south of Juniper	$ 256	$26	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 315
	2007-2015	SS17D071	Sewer	Growth	4	0%	40%	375	8	18	$262	$98,228	$53	$315	$107,100	$11,900	$119,000	$8,309	Along SW 27th Street, between Juniper and SW Lava	$ 256	$26	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 315
	2007-2015	Link680	Sewer	Growth	4	0%	40%	440	8	18	$262	$115,254	$53	$315	$125,100	$13,900	$139,000	$9,498	Along SW 27th Street, between SW Indian Avenue and SW Highland Avenue	$ 256	$26	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 315
	2007-2015	WSI_614	Sewer	Growth	4	0%	40%	1,850	11	18	$262	$484,590	$158	$420	$699,300	$77,700	$777,000	$116,964	Along SW 27th Street, between SW Obsidian Avenue and SW Lava Avenue	$ 343	$34	$9	$24	$0	$0	$0	$10	$0	$0	$0	$ 420

						Allocations		Pipelines				"Local" 8-inch sewer cost, 10 feet deep	"Local" 8-inch sewer cost, 10 feet deep	Incremental Cost exceeding "local" sewer cost	Total Project Cost	Costs					Unit Price	Engin. & Admin.	Traffic Control unit price	Rock Excava- tion Unit Price	Found. Stabil.	CDF Fill	Trench Dewatering	Erosion Control	Tunneling Boring, Jacking	Land Acquis- ition	Utility relo- cation	Total Unit Price
Project Type	Implemen- tation Phase	Model ID	Improve- ment Description	Reason for Improve- ment	Priority	Upgrade Existing	Growth	Length (ft.)	Average Depth of Bury (ft.)	Diameter (in.)	Unit Price ($/ft)		Unit Price ($/ft)	Project Unit Price ($/ft)	Construc-tion	Allowance for Eng. & Admin.	Total Estimate	Growth Cost	Location		10%	per LF	per LF	per LF	per LF	per LF	per LF	per LF	per LF	per LF	
	2007-2015	WSI_615	Sewer	Growth	4	0%	40%	2,050	9	18	$262	$536,979	$92	$354	$653,400	$72,600	$726,000	$75,609	Along SW 27th Street, between SW Salmon Avenue and SW Obsidian Avenue	$ 288	$29	$9	$18	$0	$0	$0	$10	$0	$0	$0	$ 354
	2007-2015	WSI_616	Sewer	Growth	4	0%	40%	3,800	9	15	$262	$995,375	$133	$395	$1,350,000	$150,000	$1,500,000	$201,850	Along SW 27th Street, between SW Salmon Avenue and SW Obsidian Avenue	$ 325	$33	$9	$18	$0	$0	$0	$10	$0	$0	$0	$ 395
WSI Totals								**10,933**				**$2,863,798**			**$3,650,400**	**$405,600**	**$4,056,000**	**$476,881**		$3,340,679										
Far East Interceptor	2021-2025	Link948	Sewer	Growth	4	0%	100%	50	8	36	$262		$311	$573	$26,100	$2,900	$29,000	$29,000	Link to Redmond Water Pollution Control Facility	$ 490	$49	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 573
	2021-2025	Link942	Sewer	Growth	4	0%	100%	220	5	27	$262		$55	$316	$63,000	$7,000	$70,000	$70,000	Link to Redmond Water Pollution Control Facility	$ 265	$27	$9	$6	$0	$0	$0	$10	$0	$0	$0	$ 316
	2021-2025	Link946	Sewer	Growth	4	0%	100%	100	5	24	$262		$55	$316	$28,800	$3,200	$32,000	$32,000	Link to Redmond Water Pollution Control Facility	$ 265	$27	$9	$6	$0	$0	$0	$10	$0	$0	$0	$ 316
	2021-2025	Link947	Sewer	Growth	4	0%	100%	212	5	24	$262		$55	$316	$61,200	$6,800	$68,000	$68,000	Parallel to and west of NW Canyon Dr, north of NW Spruce Ave	$ 265	$27	$9	$6	$0	$0	$0	$10	$0	$0	$0	$ 316
	2021-2025	Link907	Sewer	Growth	4	0%	100%	350	5	24	$262		$55	$316	$99,900	$11,100	$111,000	$111,000	Parallel to and west of NW Canyon Dr, north of NW Spruce Ave	$ 265	$27	$9	$6	$0	$0	$0	$10	$0	$0	$0	$ 316
	2021-2025	Link909	Sewer	Growth	4	0%	100%	260	5	24	$262		$55	$316	$74,700	$8,300	$83,000	$83,000	Parallel to and west of NW Canyon Dr, north of NW Spruce Ave	$ 265	$27	$9	$6	$0	$0	$0	$10	$0	$0	$0	$ 316
	2021-2025	Link908	Sewer	Growth	4	0%	100%	180	4	24	$262		$52	$314	$51,300	$5,700	$57,000	$57,000	Along Dry Canyon floor, north of Redmond Water Pollution Control facility	$ 265	$27	$9	$3	$0	$0	$0	$10	$0	$0	$0	$ 314
	2021-2025	Link910	Sewer	Growth	4	0%	100%	480	8	24	$262		$141	$403	$174,600	$19,400	$194,000	$194,000	Crossing Dry Canyon Ridge, west of NW Upas Ave	$ 336	$34	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 403
	2021-2025	Link911	Sewer	Growth	4	0%	100%	2,090	12	24	$262	$547,456	$278	$540	$1,015,200	$112,800	$1,128,000	$580,544	Parallel to NW Upas Ave, west of NW 10th St	$ 449	$45	$9	$27	$0	$0	$0	$10	$0	$0	$0	$ 540
	2021-2025	Link912	Sewer	Growth	4	0%	100%	370	14	24	$262	$96,918	$284	$546	$181,800	$20,200	$202,000	$105,082	Parallel to and west of NW 10th St, north of NW Upas Ave	$ 449	$45	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 546
	2021-2025	Link914	Sewer	Growth	4	0%	100%	1,294	13	24	$262	$338,951	$281	$543	$632,700	$70,300	$703,000	$364,049	North of NW Upas Ave, crossing NW 10th St	$ 449	$45	$9	$30	$0	$0	$0	$10	$0	$0	$0	$ 543
	2021-2025	Link913	Sewer	Growth	4	0%	100%	820	13	24	$262	$214,791	$281	$543	$400,500	$44,500	$445,000	$230,209	Parallel to and east of NW 10th St, south of NW Pershall Way	$ 449	$45	$9	$30	$0	$0	$0	$10	$0	$0	$0	$ 543
	2021-2025	Link916	Sewer	Growth	4	0%	100%	600	14	24	$262	$157,164	$284	$546	$295,200	$32,800	$328,000	$170,836	South of NW Pershall Way, east of NW 10th St	$ 449	$45	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 546
	2021-2025	Link915	Sewer	Growth	4	0%	100%	445	17	24	$262	$116,564	$412	$674	$270,000	$30,000	$300,000	$183,436	Parallel to and south of NW Pershall Way, west of Hwy 97	$ 557	$56	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 674
FEI Totals								**7,471**				**$1,471,845**			**$3,375,000**	**$375,000**	**$3,750,000**	**$2,278,155**		$3,750,000										
East Side Interceptor	2007-2015	SS03B037	Sewer	Growth	4	0%	70%	200	18	27	$262	$52,388	$413	$675	$121,500	$13,500	$135,000	$57,828	Along BNSF Railroad ROW south of NE King	$ 556	$56	$9	$44	$0	$0	$0	$10	$0	$0	$0	$ 675
	2007-2015	SS03B038	Sewer	Growth	4	0%	70%	230	7	27	$262	$60,246	$160	$422	$87,300	$9,700	$97,000	$25,728	Along BNSF Railroad ROW south of NE King	$ 355	$36	$9	$12	$0	$0	$0	$10	$0	$0	$0	$ 422
	2007-2015	SS03B039	Sewer	Growth	4	0%	70%	360	11	27	$262	$94,299	$236	$498	$162,000	$18,000	$180,000	$59,991	Along BNSF Railroad ROW north of NE Redwood	$ 414	$41	$9	$24	$0	$0	$0	$10	$0	$0	$0	$ 498
	2007-2015	SS03B040	Sewer	Growth	4	0%	70%	400	16	27	$262	$104,776	$343	$605	$217,800	$24,200	$242,000	$96,057	Along BNSF Railroad ROW between NE Redwood and NE Quince	$ 498	$50	$9	$39	$0	$0	$0	$10	$0	$0	$0	$ 605
	2007-2015	SS03B041	Sewer	Growth	4	0%	70%	130	17	27	$262	$34,052	$346	$608	$72,000	$8,000	$80,000	$32,163	Along BNSF Railroad ROW at NE Quince	$ 498	$50	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 608
	2007-2015	ESI600	Sewer	Growth	4	0%	70%	1,300	17	24	$262	$340,523	$332	$594	$695,700	$77,300	$773,000	$302,734	Along BNSF Railroad ROW north of NE Negus	$ 485	$49	$9	$41	$0	$0	$0	$10	$0	$0	$0	$ 594
	2007-2015	ESI601	Sewer	Growth	4	0%	70%	1,530	20	24	$262	$400,769	$421	$683	$940,500	$104,500	$1,045,000	$450,961	West of NE 5th Street north from NE Shoshone	$ 557	$56	$9	$50	$0	$0	$0	$10	$0	$0	$0	$ 683
	2016-2020	ESI603	Sewer	Growth	4	0%	70%	1,350	14	24	$262	$353,620	$284	$546	$663,300	$73,700	$737,000	$268,366	Parallel and west of 3rd Street from NE Kilnwood Lane to NE Negus	$ 449	$45	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 546
	2016-2020	ESI594	Sewer	Growth	4	0%	70%	1,250	13	24	$262	$327,426	$221	$483	$543,600	$60,400	$604,000	$193,602	Along BNSF Railroad ROW north of NE Hemlock to NE Kilnwood Lane	$ 395	$39	$9	$30	$0	$0	$0	$10	$0	$0	$0	$ 483
	2016-2020	ESI_Negus	Sewer	Growth	3	50%	70%	55	10	12	$262	$14,407	$66	$328	$17,100	$1,900	$19,000	$3,215	Along NE Negus Way, east of the railroad ROW	$ 262	$26	$9	$21	$0	$0	$0	$10	$0	$0	$0	$ 328
	2016-2020	FEi_717	Sewer	Growth	3	50%	100%	400	8	12	$262	$104,776	$60	$322	$116,100	$12,900	$129,000	$24,224	Along NE Negus Way, between NE 11th St and NE 9th St	$ 262	$26	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 322
	2016-2020	FEi_716	Sewer	Growth	3	50%	79%	1,000	13	12	$262	$261,941	$130	$392	$352,800	$39,200	$392,000	$102,747	Along NE Negus Way, between NE 9th St and NE 7th St	$ 312	$31	$9	$30	$0	$0	$0	$10	$0	$0	$0	$ 392
	2016-2020	SS10B046	Sewer	Growth	3	50%	74%	216	10	12	$262	$56,579	$66	$328	$63,900	$7,100	$71,000	$10,671	Along NE Negus Way, between NE 6th St and NE 5th St	$ 262	$26	$9	$21	$0	$0	$0	$10	$0	$0	$0	$ 328
	2016-2020	SS03C008	Sewer	Growth	3	50%	79%	172	12	12	$262	$45,054	$127	$389	$60,300	$6,700	$67,000	$17,337	Along NE Negus Way, west of NE 5th St	$ 312	$31	$9	$27	$0	$0	$0	$10	$0	$0	$0	$ 389
	2016-2020	Link715	Sewer	Growth	3	50%	74%	470	10	12	$262	$123,112	$66	$328	$139,500	$15,500	$155,000	$23,597	Along NE Negus Way, west of NE 5th St	$ 262	$26	$9	$21	$0	$0	$0	$10	$0	$0	$0	$ 328
	2021-2025	ESI593	Sewer	Growth	4	0%	76%	2,600	13	24	$262	$681,046	$221	$483	$1,131,300	$125,700	$1,257,000	$437,725	Along BNSF Railroad ROW south of NE Hemlock	$ 395	$39	$9	$30	$0	$0	$0	$10	$0	$0	$0	$ 483
	2021-2025	ESI604	Sewer	Growth	4	0%	77%	1,500	10	24	$262	$392,911	$212	$474	$640,800	$71,200	$712,000	$245,698	Along BNSF ROW from SE Evergreen Avenue to E Antler Avenue	$ 395	$39	$9	$21	$0	$0	$0	$10	$0	$0	$0	$ 474
	2021-2025	ESI606	Sewer	Growth	4	0%	83%	3,000	6	18	$262	$785,822	$12	$274	$739,800	$82,200	$822,000	$30,028	Along BNSF ROW from Kalama Avenue to SE Evergreen Avenue	$ 224	$22	$9	$9	$0	$0	$0	$10	$0	$0	$0	$ 274
	2021-2025	ESI607	Sewer	Growth	4	0%	83%	2,000	9	18	$262	$523,881	$152	$414	$746,100	$82,900	$829,000	$253,248	Along BNSF ROW from Kalama Avenue south of SE Evergreen Avenue	$ 343	$34	$9	$18	$0	$0	$0	$10	$0	$0	$0	$ 414
	2021-2025	ESI_001	Sewer	Growth	4	0%	83%	4,830	10	18	$262	$1,265,174	$155	$417	$1,813,500	$201,500	$2,015,000	$622,356	From BNSF ROW north of SW Veterans Way, east on SW Veterans Way, then south to SW 6th St and SW Reindeer Ave	$ 343	$34	$9	$21	$0	$0	$0	$10	$0	$0	$0	$ 417
	2021-2025	LineN	Sewer	Growth	4	0%	91%	2,770	10	8	$262	$725,576	$36	$298	$742,500	$82,500	$825,000	$90,476	North from the north end of SW 13th St to approximately 1,000 ft west of SW Reindeer Ave	$ 235	$23	$9	$21	$0	$0	$0	$10	$0	$0	$0	$ 298
	2021-2025	ESSI	Sewer	Growth	4	0%	91%	7,200	15	12	$262	$1,885,973	$402	$664	$4,300,200	$477,800	$4,778,000	$2,631,744	South on SE 13th St continuing south on SE Airport Way, along SE 19th St to city limit	$ 554	$55	$9	$36	$0	$0	$0	$10	$0	$0	$0	$ 664
ESI Totals								**32,963**				**$8,634,353**			**$14,367,600**	**$1,596,400**	**$15,964,000**	**$5,980,497**		$14,614,850										
Line A	2007-2015	LineA	Sewer	Growth	4	0%	75%	**5,300**	20	15	$262	$1,388,286	$219	$481	**$2,295,000**	**$255,000**	**$2,550,000**	$871,286	Area west of Cascade View Phase 7 PS, along SW Canal Blvd to SW 27th St	$ 374	$37	$9	$50	$0	$0	$0	$10	$0	$0	$0	$ 481
																				$2,259,571										
Line D	2007-2015	LineD	Sewer	Growth	4	0%	100%	**9,900**	14	15	$262	$2,593,213	$201	$463	**$4,128,300**	**$458,700**	**$4,587,000**	$1,993,787	South along SW Helmholtz Way, between SW Obsidian Ave and SW Xero Ave, south along SW 46th St south of SW Xero Ave	$ 374	$37	$9	$33	$0	$0	$0	$10	$0	$0	$0	$ 463
																				$4,587,000										
Line J	2021-2025	LineJ	Sewer	Growth	4	0%	71%	**5,750**	15	8	$262	$1,506,159	$96	$357	**$1,850,400**	**$205,600**	**$2,056,000**	$390,387	East along E Antler Ave from SE Railroad Blvd, south to SE Black Butte Blvd, east on SE Black Butte Blvd, north on SE 6th St, east on E Antler Ave	$ 275	$28	$9	$36	$0	$0	$0	$10	$0	$0	$0	$ 357
																				$1,896,546										
Line K	2021-2025	LineK	Sewer	Growth	4	0%	60%	**9,790**	8	10	$262	$2,564,400	$58	$320	**$2,823,300**	**$313,700**	**$3,137,000**	$343,560	East along SE Evergreen Ave from BNSF ROW, south on SE 9th St, then SW on Hwy 126	$ 261	$26	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 320
																				$2,907,960										
Line L	2021-2025	LineL	Sewer	Growth	4	0%	81%	**2,730**	10	8	$262	$715,098	$36	$298	**$732,600**	**$81,400**	**$814,000**	$80,110	From approximately 1,000 ft west of SW Reindeer Ave to SW 6th St, north of SW Umatilla Ave	$ 235	$23	$9	$21	$0	$0	$0	$10	$0	$0	$0	$ 298
																	$3,679,130			$795,209										
Gravity Pipe Replacement	2007-2015	SS15B018	Sewer	Capacity	3	0%	0%	428	11	12	$262		$123	$385	$148,500	$16,500	$165,000	$1,566,000	Between Railroad Blvd and SE Franklin Street, between SE Black and SE Cascade	$ 312	$31	$9	$22	$0	$0	$0	$10	$0	$0	$0	$ 385
	2007-2015	SS04B059	Sewer	Capacity	3	0%	0%	14	5	12	$262		$0	$248	$3,600	$400	$4,000	max/Qfull ratio = 1	Between NW 19th and NW Canyon (W of 2807 NW Canyon & E of 3100 NW 19th)	$ 203	$20	$9	$5	$0	$0	$0	$10	$0	$0	$0	$ 248
	2007-2015	SS09A071	Sewer	Capacity	3	0%	0%	8	8	15	$262		$41	$303	$2,700	$300	$3,000	max/Qfull ratio = 1	S of 850 NW Maple in, & N of midpoint of 1554 NW 9th & 1553 NW 8th St.	$ 246	$25	$9	$14	$0	$0	$0	$10	$0	$0	$0	$ 303

						Allocations		Pipelines				"Local" 8-inch sewer cost, 10 feet deep	"Local" 8-inch sewer cost, 10 feet deep	Incremental Cost exceeding "local" sewer cost	Total Project Cost	Costs					Unit Price	Engin. & Admin.	Traffic Control unit price	Rock Excava- tion Unit Price	Found. Stabil.	CDF Fill	Trench Dewatering	Erosion Control	Tunneling Boring, Jacking	Land Acquis- ition	Utility relo- cation	Total Unit Price
Project Type	**Implemen- tation Phase**	**Model ID**	**Improve- ment Description**	**Reason for Improve- ment**	**Priority**	**Upgrade Existing**	**Growth**	**Length (ft.)**	**Average Depth of Bury (ft.)**	**Diameter (in.)**	**Unit Price ($/ft)**			**Unit Price ($/ft)**	**Project Unit Price ($/ft)**	**Construc-tion**	**Allowance for Eng. & Admin.**	**Total Estimate**	**Growth Cost**	**Location**		**10%**	**per LF**	**per LF**	**per LF**	**per LF**	**per LF**	**per LF**	**per LF**	**per LF**	**per LF**	
	2007-2015	SS15B047	Sewer	Capacity	3	0%	0%	309	8	10	$262			$26	$288	$80,100	$8,900	$89,000	ax/Qfull ratio = 1	E from 365 SE Ridge Way to 545 SE Deschutes Ave (W of Canal)	$ 231	$23	$9	$15	$0	$0	$0	$10	$0	$0	$0	$ 288
	2007-2015	SS15B049	Sewer	Capacity	3	0%	0%	167	6	10	$262			$0	$250	$37,800	$4,200	$42,000	ax/Qfull ratio = 1	E from South of 649 SE Evergreen Ave block to W of 639 SE Evergreen Ave block	$ 202	$20	$9	$10	$0	$0	$0	$10	$0	$0	$0	$ 250
	2007-2015	SS15B039	Sewer	Capacity	3	0%	0%	369	6	10	$262			$0	$250	$83,700	$9,300	$93,000	ax/Qfull ratio = 1	half way between 436 and 439 blocks of SE Deschutes Ave to S of 251 SE 5th St	$ 202	$20	$9	$10	$0	$0	$0	$10	$0	$0	$0	$ 250
	2007-2015	SS15B046	Sewer	Capacity	3	0%	0%	130	7	10	$262			$0	$253	$29,700	$3,300	$33,000	ax/Qfull ratio = 1	E from 545 SE Deschutes Ave (W of Canal) to E of Canal (N of 436 SE Deschutes)	$ 202	$20	$9	$12	$0	$0	$0	$10	$0	$0	$0	$ 253
	2007-2015	SS15B038	Sewer	Capacity	3	0%	0%	341	6	10	$262			$0	$249	$76,500	$8,500	$85,000	ax/Qfull ratio = 1	S of 251 SE 5th St to N of 211 SE 5th St..	$ 202	$20	$9	$8	$0	$0	$0	$10	$0	$0	$0	$ 249
	2007-2015	SS04B014	Sewer	Capacity	3	0%	0%	414	7	21	$262			$59	$321	$119,700	$13,300	$133,000	ax/Qfull ratio = 1	Parallel to 2663 to 2545 NW canyon Dr Property lines. W of these properties	$ 265	$27	$9	$10	$0	$0	$0	$10	$0	$0	$0	$ 321
	2007-2015	SS15B015	Sewer	Capacity	3	0%	0%	21	10	12	$262			$67	$329	$6,300	$700	$7,000	ax/Qfull ratio = 1	Starts halfway between 353 SE Railroad Blvd & 216 SE Railroad Blvd to SW of 216 SE Railroad block	$ 262	$26	$9	$22	$0	$0	$0	$10	$0	$0	$0	$ 329
	2007-2015	SS15B030	Sewer	Capacity	3	0%	0%	180	10	12	$262			$66	$328	$53,100	$5,900	$59,000	ax/Qfull ratio = 1	NW of 208 SE Franklin St to SW of 228 SE Franklin St (parallel to the W property line of these two blocks). Between 229 SE and 208 SE Franklin St	$ 262	$26	$9	$20	$0	$0	$0	$10	$0	$0	$0	$ 328
Gravity Pipe Replacement Totals								**2,380**								**$641,700**	**$71,300**	**$713,000**	0												
															Total			**$62,095,000**	**$25,027,075**												

Notes:
1. Pipe Priority Level:

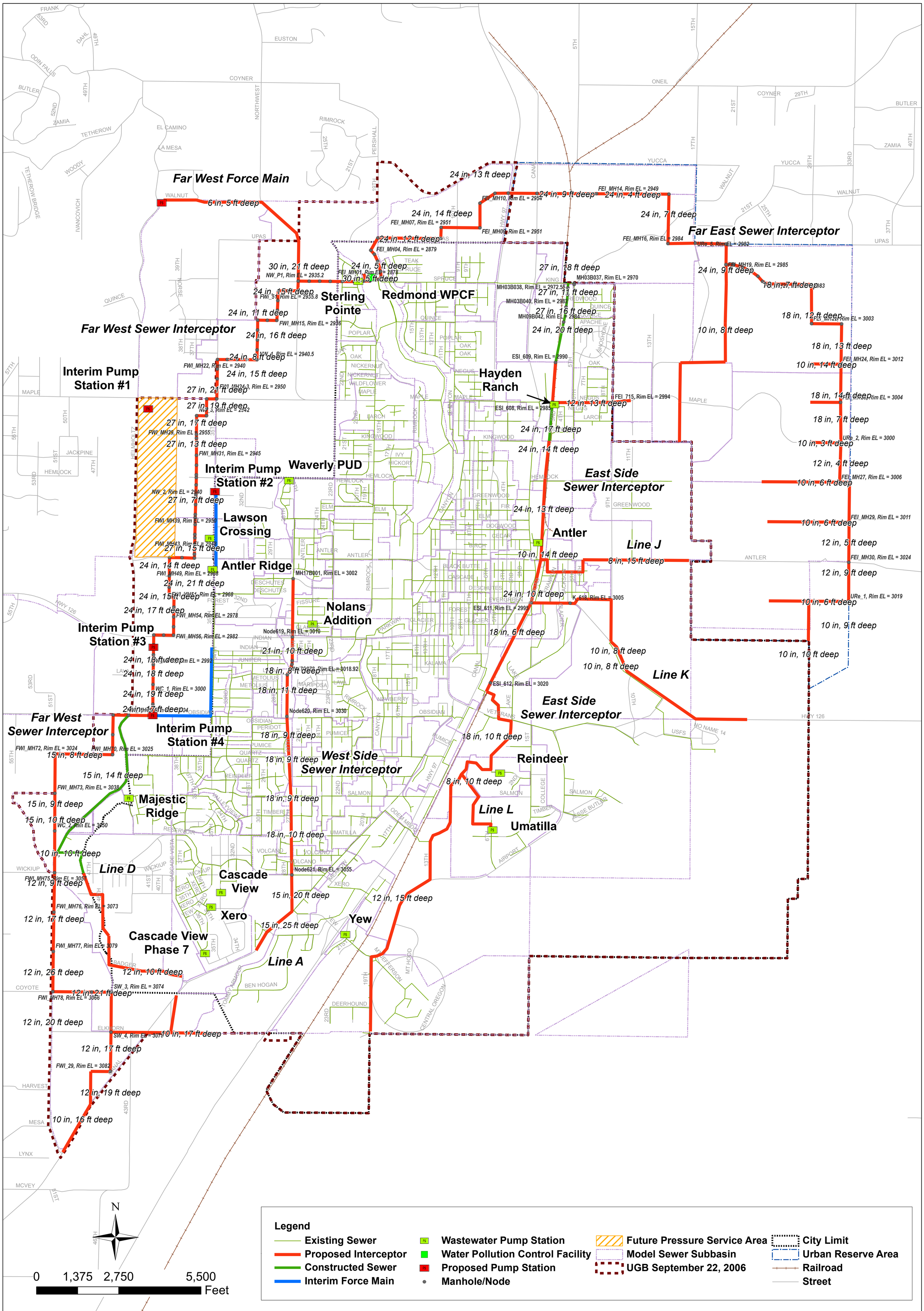
1 = Current Capacity Deficiency
2 = Capacity Deficiency within 5 years
3 = Capacity Deficiency at Buildout
2. Alignment 4 = Growth Driven Improvement

CITY OF REDMOND WPCF CIP

Proposed WPCF Upgrades thru 2030 (pop 58,000/buildout) under current permit conditions (TN 9)

Item	Construction Cost, 2007$	Engineering, Admin, Contingency (30%)	Total Capital Cost	Design Criteria	Capacity Related % (SDC Eligible)	Non-SDC %	Total SDC Eligible Funding	Total Non-SDC Funding
Phase I: 2008-2015								
Headworks								
Add screening	$1,703,340	$ 511,002	$ 2,214,342	PHF	63%	37%	$ 1,390,086	$ 824,255
New dumpster building	$230,846	$ 69,254	$ 300,100	PHF	63%	37%	$ 188,392	$ 111,708
MCC/electrical building modifications/storage	$19,961	$ 5,988	$ 25,949	PHF	63%	37%	$ 16,290	$ 9,659
Headworks odor control	$250,817	$ 75,245	$ 326,063	PHF	63%	37%	$ 204,691	$ 121,372
Existing bar screen modification	$32,364	$ 9,709	$ 42,073	PHF	63%	37%	$ 26,412	$ 15,661
New Bar Screen	$556,000	$ 166,800	$ 722,800	PHF	63%	37%	$ 453,749	$ 269,051
Collection system influent piping improvements	**$224,000**	$ 67,200	$ 291,200	PHF	63%	37%	$ 182,805	$ 108,395
Secondary treatment aeration controls								
Additional aerators	$1,316,967	$ 395,090	$ 1,712,057	MMF	63%	37%	$ 1,075,307	$ 636,750
RAS controls improvements	$59,932	$ 17,980	$ 77,912	MMF	63%	37%	$ 48,935	$ 28,977
New secondary clarifier splitter structure	$383,657	$ 115,097	$ 498,753	MMF	63%	37%	$ 313,256	$ 185,497
Secondary clarifiers								
Secondary clarifier rehabilitation	$265,883	$ 79,765	$ 345,647	MMF	0%	100%	$ -	$ 345,647
New secondary clarifier	$1,849,079	$ 554,724	$ 2,403,803	MMF	100%	0%	$ 2,403,803	$ -
RAS pumps	$152,189	$ 45,657	$ 197,846	MMF	63%	37%	$ 124,144	$ 73,701
Disinfection improvements and dechlorination system	**$572,595**	$ 171,779	$ 744,374	MMF	63%	37%	$ 467,080	$ 277,293
Conveyance 24-inch pipeline	**$3,377,468**	$ 1,013,240	$ 4,390,708	MMF	100%	0%	$ 4,390,708	$ -
Infiltration basin								
Add infiltration Basin No. 4	**$164,400**	$ 49,320	$ 213,720	AAF	63%	37%	$ 134,166	$ 79,554
Total Phase I	**$ 11,159,497**	**$ 3,347,849**	**$ 14,507,346**				**$ 11,419,824**	**$ 3,087,522**
Phase II: 2016-2020								
Secondary treatment aeration controls								
New oxidation ditch	$ 8,727,559	$ 2,618,268	$ 11,345,827	MMF	100%	0%	$ 11,345,827	$ -
RAS controls improvements	$ 350,000	$ 105,000	$ 455,000	MMF	63%	37%	$ 285,504	$ 169,496
Disinfection								
UV	$ 1,850,000	$ 555,000	$ 2,405,000	MMF	63%	37%	$ 1,509,775	$ 895,225
Administration building expansion	$ 779,000	$ 233,700	$ 1,012,700		0%	100%	$ -	$ 1,012,700
Total Phase II	**$ 11,706,559**	**$ 3,511,968**	**$ 15,218,527**				**$ 13,141,105**	**$ 2,077,421**
Phase III: 2021-2025		**$ -**						
Headworks		$ -						
Grit removal and washing	$ 642,761	$ 192,828	$ 835,589	PHF	63%	37%	$ 524,554	$ 311,036
Solids handling								
Upgrade existing solids storage	$ 1,000,496	$ 300,149	$ 1,300,645	Solids	61%	39%	$ 794,303	$ 506,342
Solids equipment replacement	$ 1,212,323	$ 363,697	$ 1,576,020	Solids	61%	39%	$ 962,474	$ 613,546
Add dryer for Class A	$ 3,173,611	$ 952,083	$ 4,125,694	Solids	61%	39%	$ 2,519,559	$ 1,606,136
Infiltration basin								
Add infiltration Basin No. 5	$ 533,600	$ 160,080	$ 693,680	PHF	100%	0%	$ 693,680	$ -
Total Phase III	**$ 6,562,791**	**$ 1,968,837**	**$ 8,531,628**				**$ 5,494,570**	**$ 3,037,059**
Phase IV: 2026-2030		**$ -**						
Headworks		$ -						
Add screening	$ 1,000,000	$ 300,000	$ 1,300,000	PHF	100%	0%	$ 1,300,000	$ -
Secondary treatment aeration controls								
New oxidation ditch	$ 8,727,559	$ 2,618,268	$ 11,345,827	MMF	100%	0%	$ 11,345,827	$ -
Secondary clarifiers								
New secondary clarifier	$ 2,806,972	$ 842,092	$ 3,649,064	PHF	100%	0%	$ 3,649,064	$ -
Disinfection								
UV	$ 2,700,000	$ 810,000	$ 3,510,000	PHF	100%	0%	$ 3,510,000	$ -
Total Phase IV	**$ 15,234,531**	**$ 4,570,359**	**$ 19,804,890**				**$ 19,804,890**	**$ -**
Total All Phases	**$ 44,663,378**	**$ 13,399,013**	**$ 58,062,391**				**$ 49,860,390**	**$ 8,202,002**

SECTION 7-3: CIP MAPS



CH2MHILL

CITY OF REDMOND, OR

March 2008

EXHIBIT 3-5
Proposed Interceptor System
Redmond Wastewater System Master Plan

SECTION 7-4: WASTEWATER SDC ANALYSIS

Wastewater SDC Methodology

This section presents the updated wastewater SDC analysis, based on the general methodology described in Section 1, and the City's recently completed Wastewater (Collection System) and Water System Master Plan (CH2M HILL, December 2007) and the Water Pollution Control Facility (WPCF) Facilities Plan Update (Brown and Caldwell, December 2007).

Determine Capacity Needs

Table 1 shows the planning assumptions for the wastewater system contained in the system plans.

The relevant design criteria for the wastewater system include the following:

- Average flow (AF): the average flow at the WWTP during the dry weather season, usually defined as May through October. Used to estimate customer wastewater flows.
- Peak Flow (PF): the peak flow modeled for the collection system, which includes base wastewater flow (BWF), groundwater infiltration (GWI), and rainfall derived infiltration and inflow (RDII).
- Peak hour flow (PHF): the highest flow at the WWTP sustained for 1 hour.
- Maximum day flow (MDF): the highest 24-hour flow in the period of record.
- Maximum month flow (MMF): the highest average monthly flow (based on 30 day moving average computed for each day during the period of record) at the WWTP
- Maximum month waste activated sludge (MMWAS): the highest average monthly WAS solids production (based on 30 day moving average computed during the period of record; or projected by process modeling based on the maximum month waste loading at the WWTP).

As shown in **Table 1**, the Wastewater (Collection System) and Water System Master Plan estimates current peak flows of 3.0 million gallons per day (mgd), compared to the estimated PHF at the WPCF of 4.9 mgd. The difference is that the collection system plan estimates exclude stormwater flows that enter the system periodically when operators divert stormwater to the sanitary system as permitted by Oregon DEQ, whereas the WPCF Facilities Plan includes such flows. As noted in the collection system plan, the City plans to abandon these connections in the future. Future projected PF conditions for the year 2030 are 9.4 mgd for the collection system and 13.1 mgd for the WPCF.

The collection system plan included analysis of the existing Urban Reserve Area (URA); total projected future PHF (assuming population of 78,000), including the 2,260 acres of URA is 12.6 mgd.

As shown in Table 1, the WPCF PHF capacity required by growth thru 2030 is estimated to be 8.2 mgd, and represents about 63 percent of the future system PHF. Growth-related peak flows for the collection system are estimated to be 6.4 mgd (67 percent of future 2030 flows) and 9.6 mgd through build-out of the URA.

Equivalent dwelling units (EDUs) are estimated based on the current number of meter equivalents, consistent with the water system (see Section 2). Like many other cities, the City uses water meter size as a basis for assessing wastewater SDCs, as water capacity needs may also be representative of potential wastewater capacity needs (through return flows).

TABLE 1
City of Redmond Sewer System SDC Analysis
Sewer System Planning Assumptions

Capacity Parameter	Existing	Future		Growth	
		2030	w/URA	2030	w/URA
Collection System Master Plan					
Peak Flow (mgd)	3.0	9.4	12.6	6.4	9.6
WPCF Facility Plan Update					
Average Flow (mgd)	2.2	5.9		3.7	
Max Month Flow (mgd)	2.4	6.6		4.1	
Max Day Flow (mgd)	3.0	8.1		5.1	
Peak Hour Flow (mgd)	4.9	13.1		8.2	
MM WAS (lbs/day)	5,567[A]	14,300		8,733	
EDUs	11,020	28,462		17,441	

[A] Existing WAS production based on City staff review of recent data. January 2008 data used for existing condition max month production as it was highest observed from September 2007 – January 2008.

Current system capacities and available capacities vary among WPCF components, as shown in **Table 2**. As indicated in Section 1, Oregon SDC law allows for inclusion of a reimbursement fee, provided that existing system capacity can be demonstrated.

As Table 2 indicates, the WPCF has sufficient capacity to meet current requirements with respect to all major unit processes. Available capacity for growth ranges from 15.9 percent for the headworks, to 44.3 percent for solids handling.

TABLE 2
City of Redmond Sewer System SDC Analysis
Capacity Analysis by Unit Process

Component	Design Criteria	Existing Capacity	Existing Flow/Load	Available Capacity	
				Quantity	%
Headworks	PHF	5.8	4.9	0.92	15.9%
Secondary Treatment	MMF	3.24	2.44	0.80	24.7%
Disinfection	MDF	4.46	3.0	1.44	32.3%
Effluent	PHF	6.5	4.9	1.62	24.9%
Solids Handling	WAS	10,000	5,567	4,433	44.3%

Develop Cost Basis

The capacity needed to serve new development will be met through a combination of existing and planned system improvements. The reimbursement fee is intended to recover the costs associated with the growth-related (or available) capacity in the existing system; the improvement fee is based on the costs of capacity-increasing future improvements needed to meet the demands of growth. The value of capacity needed to serve growth in aggregate within the planning period, adjusted for expected contributions, is referred to as the "cost basis".

Reimbursement Fee

Table 3 shows the reimbursement fee cost basis calculation, based on the original cost of existing system assets and work in progress. The total system value, including fixed assets as of June 30, 2007 and WPCF construction work in progress for fiscal year 2007-08, is about $33 million The majority of the original 1978 WPCF facility construction was funded by federal and state grants. The 2000 WPCF expansion also had $2 million in grant funding. Estimated grant funding is deducted from the cost basis, along with developer contributions for the collection system.

Table 3
City of Redmond Sewer
System SDC Analysis
Reimbursement Fee Cost Basis

Function	Design Criteria	Total Cost (1)	Interest	Grants & Contributions	Net Cost	Growth %	Growth $
Fixed Assets (through June 30, 2007)							
Treatment (General)	AAF	$4,401,464	$2,530,000	$1,746,357	$5,185,107	26.4%	$1,369,978
Headworks	PHF	$74,948	$0	$74,948	$0	15.9%	$0
Secondary	MMF	$606,688	$225,046	$174,056	$657,678	24.7%	$162,390
Aeration	MMF	$3,678,610	$2,774,313	$579,106	$5,873,817	24.7%	$1,450,325
Disinfection	MDF	$61,950	$0		$61,950	32.3%	$20,002
Effluent	PHF	$278,590	$0	$278,590	$0	24.9%	$0
Biosolids	Solids	$3,796,425	$2,571,961	$536,868	$5,831,518	44.3%	$2,585,112
Subtotal		$12,898,675	$8,101,320	$3,389,924	$17,610,070	32%	$5,587,807
Collection	PF	$5,723,250	$1,480,040	$4,315,217	$2,888,074	60%	$1,732,844
Total Fixed Assets		**$18,621,925**	**$9,581,360**	**$7,705,141**	**$20,498,144**		**$7,320,651**
Work in Progress							
Phase 1 WPCF Construction		$14,507,346	3,378,329	$0	$17,885,675	79%	$14,079,162
Total Reimbursement fee Cost Basis		**$33,129,271**					**$21,399,812**

(1) Based on original purchase price

Based on the existing system inventory of pipe length by size, about 70 percent of the system (in linear feet) is 8 inches or smaller in diameter. Therefore, 70 percent of the collection system costs are assumed to be contributed, which is a conservative assumption, given that the City has likely funded some of the original construction; however the fixed asset records do not track these contributions separately. For pipes over 8 inches in diameter, growth is allocated costs in proportion to existing reserve capacity per the hydraulic model (60 percent).

Consistent with the current SDC methodology, the reimbursement fee cost basis includes interest costs associated with debt funding of the 2000 and 2008 system expansions. The portion of interest included in the cost basis is limited to the amount of available capacity by component. Growth available capacity by component is determined based on the analysis shown in Table 2 for the individual WPCF processes. General treatment assets are allocated in proportion to average flow available capacity. The current plant average flow design capacity is 2.99 mgd, compared to current average flow of 2.2 (based on the WPCF Facility Plan), resulting in available capacity of 0.8 mgd or 26 percent. Phase 1 costs for the WPCF expansion (including interest) are allocated based on the individual projects and costs shown in Appendix A. As the City recently began construction on these projects, the costs are included in the reimbursement fee, instead of the improvement fee.

Based on the available capacity analysis and adjustments for grant funding and interest costs, the WPCF-related reimbursement cost basis is $19.7 million, including work in progress. When collection system costs are added, the total reimbursement fee cost basis is $21.4 million.

Improvement Fee

Each improvement on the collection system and WPCF facility CIP was reviewed to determine the portion of costs that expand capacity for growth. The resulting cost allocations are shown in Table 4, with the detailed CIP provided in Appendix A. Capacity expansion improvement costs are allocated to growth in proportion to growth's projected share of the planned capacity expansion, as summarized in Table 5.

Table 4
City of Redmond Sewer System SDC Analysis
Improvement Fee Cost Basis

Phase	Total Cost		SDC %	Growth $
WPCF CIP*				
Phase 2	$15,218,527		86%	$13,141,105
Phase 3	$8,531,628		64%	$5,494,570
Phase 4	$19,804,890		100%	$19,804,890
				$0
Total Treatment	$43,555,045		86%	$38,440,565
Collection System CIP				
Far West Interceptor	$24,468,000		52%	$12,612,413
West Side Interceptor	$4,056,000		12%	$476,881
Far East Interceptor	$3,750,000		61%	$2,278,155
East Side Interceptor	$15,964,000		37%	$5,980,497
Line A	$2,550,000		34%	$871,286
Line D	$4,587,000		43%	$1,993,787
Line J	$2,056,000		19%	$390,387
Line K	$3,137,000		11%	$343,560
Line L	$814,000		10%	$80,110
Subtotal	61,382,000			25,027,075
Pipe Replacement	713,000	PF	0%	0
Subtotal	713,000			-
Total Collection	62,095,000		40%	25,027,075
Total Wastewater System	**$105,650,045**		60%	**$63,467,641**

*Phase 1 included in reimbursement fee, as construction is underway

As indicated in Table 2, the existing system has sufficient capacity to meet current needs; therefore, future expansion is required only for growth. However, the CIP also includes a number of system upgrades and performance enhancements that will benefit both existing and future customer proportionately. As shown in Table 5 (and Appendix A), performance costs are allocated to growth 61-63 percent, based on growth's share of 2030 design flows and loads. The SDCs do not include the cost of existing system replacement (for example, repair of existing secondary clarifiers).

The collection system allocations vary by project, and are based on hydraulic modeling analysis which compares flows generated by existing and future land uses. The SDC cost basis excludes the portion of construction costs for the required improvements (generally local, 8-inch diameter lines) that are assumed to be funded by developers, as well as the replacement of undersized lines in existing developed areas (e.g., downtown).

As shown in Table 4, the improvement fee cost basis for treatment facility improvements totals $38.4 million. Collection system improvements account for $25.0 million of the improvement fee cost basis. The total improvement fee cost basis is $63.5 million.

TABLE 5
City of Redmond Sewer System SDC Analysis
Determination of Improvement Allocation Percentages

	Expansion Total Capacity	Existing		Growth	
		Amt.	%	Amt.	%
Expansion Allocations					
Headworks	7.31	-	0%	7.31	100%
Secondary Treatment	3.31	-	0%	3.31	100%
Disinfection	3.66	-	0%	3.66	100%
Effluent	6.61	-	0%	6.61	100%
Performance Allocations					
Average Flow (mgd)	5.92	2.20	37%	3.72	63%
Max Month Flow (mgd)	6.55	2.44	37%	4.11	63%
Max Day Flow (mgd)	8.12	3.02	37%	5.10	63%
Peak Hour Flow (mgd)	13.11	4.88	37%	8.23	63%
WAS, MM (lbs/day)	14,300	5,567	39%	8,733	61%

Develop SDC Schedule

System-wide unit costs of capacity are determined by dividing the reimbursement fee and improvement fee cost bases identified in Tables 3 and 4, by the aggregate growth-related capacity requirements defined in Table 1. The unit costs are then applied to the capacity requirements of a typical dwelling unit to determine the fee per equivalent dwelling unit (EDU).

EDU Capacity Requirements

Table 6 presents the calculation of the capacity requirements by design criteria per EDU. Estimating capacity requirements for the collection system begins with the base flow per capita of 80 gpd. Assuming 2.6 persons per household, the base flow per single family dwelling is 208 gpd. The Collection System Master Plan indicates a diurnal peaking factor of 1.6, resulting in PF per EDU of 333 gpd.

The capacity requirements per EDU for treatment design criteria reflect the peaking factors for each design criteria relative to the WPCF Facility Plan average flow. The peaking factors range from 1.1 for MMF to 2.2 for PHF. Solids capacity is based on the average pounds per day per EDU of 0.505 (existing maximum month WAS from Table 1 divided by the existing EDUs).

TABLE 6
City of Redmond Sewer System SDC Analysis
Capacity Requirements per Equivalent Dwelling Unit (EDU)

	Value
Per capita flow (gpd)	80
Persons per household	2.60
Collection System Plan	
Base flow per EDU (gpd)	208
PF (gpd)	333
WPCF Design Criteria	
MMF (gpd)	230
MDF (gpd)	285
PHF (gpd)	461
Solids (lbs/day)	0.505

Reimbursement Fee

Table 7 shows the reimbursement fee calculation by design criteria. The cost basis figures are summed by design criteria from Table 3, and divided by capacity requirements from Table 1 to determine the unit costs of capacity. Multiplying the per unit capacity requirements by the system-wide unit costs, yields a reimbursement fee of $1,165.

Improvement Fee

The improvement fee calculation is shown in **Table 8**. The cost basis is distributed over aggregate capacity requirements through 2030 for treatment, and through buildout of the URA for collection. The unit costs of capacity are then multiplied by the EDU capacity requirements to determine the SDC per EDU by component. The resulting cost per EDU is $3,029.

Table 7
City of Redmond Sewer System SDC Analysis
Reimbursement Fee Calculation

Item	PF	PHF	AAF	MMF	MDF	Solids	Total
Reimbursement Fee Cost Basis	$1,732,844	$3,181,462	$1,543,321	$12,337,071	$20,002	$2,585,112	$21,399,812
Capacity Units	mgd	mgd	mgd	mgd	mgd	lbs/day	
Growth Capacity Requirements	9.56	8.23	3.72	4.11	5.10	8,733	
System-wide Unit Cost of Capacity	$181,260	$386,569	$414,871	$3,001,721	$3,922	$296	
Capacity Requirements per Unit	0.000333	0.000460	0.000208	0.000230	0.000285	0.505161	
Reimbursement Fee Per Unit	$60	$178	$86	$690	$1	$150	$1,165

Table 8
City of Redmond Sewer System SDC Analysis
Improvement Fee Calculation

	Total	Collection PF	PHF	AAF	MMF	MDF	Solids	Total
Growth Cost	$126,935,281	$25,027,075	$9,677,297	$0	$24,486,932	$0	$4,276,336	$62,581,186
Capacity Units		mgd	mgd	mgd	mgd	mgd	lbs/day	
Growth Capacity Requirements		9.56	8.23	3.72	4.11	5.10	8,733	
Unit Cost		$2,617,895	$1,175,856	$0	$5,957,891	$0	$490	
Capacity Requirements per Unit		0.000333	0.000460	0.000208	0.000230	0.000285	0.505161	
Improvement Fee Per Unit	$3,029	$871	$541	$0	$1,369	$0	$247	$2,998

Adjustments

The SDC methodology includes adjustments to the combined SDC for compliance costs, as well as a credit for future rate payments. Each is discussed below.

Compliance costs. Local governments are entitled to include in the SDCs, a charge to recover costs associated with complying with the SDC law. Compliance costs include costs related to developing the SDC methodology and project list (i.e., a portion of facility planning costs), and annual accounting costs. **Table 9** shows the calculation of the compliance charge per EDU, which is estimated to be $81.

Table 9
City of Redmond Sewer System SDC Analysis
Compliance Charge

Component	Years	Total	Growth	Annualized
SDC				
Study	5	$7,500	100%	$1,500
Master Planning	5	$310,000	60%	$37,246
Auditing/Accounting	1	$1,500		$1,500
Total Annual Costs		$319,000		$40,246
Estimated Annual EDUs				497
Admin Charge/EDU				**$81**

Rate supported CIP credit. A credit to the combined SDC is included, to recognize the contribution by new development toward CIP costs associated with providing capacity to serve existing customers. Once connected to the system, new customers will pay monthly user fees that are used to retire existing and future debt that will fund capital improvements that benefit existing customers. A credit is provided – equal to the present value of the future payments per EDU – to recognize this future contribution. The amount of the credit is $188 per EDU.

Combined Fee

As shown in Table 10, the total SDC per EDU is $4,087, including the reimbursement component of $1,165, the improvement component of $3,029, and the adjustments.

Table 10
City of Redmond Sewer System SDC Analysis
Combined SDC per Equivalent Dwelling Unit

Component	Amount
Reimbursement SDC per EDU	$1,165
Improvement SDC per EDU	$3,029
Combined SDC per EDU	$4,194
Debt Credit	($188)
Compliance Charge	$81
Total SDC per EDU	**$4,087**
Current SDC per EDU	***$2,105***

As for the current SDCs, the revised SDCs are based on the estimated capacity requirements of each development type relative to a typical dwelling unit (with a 5/8″ meter). The revised SDCs are shown in **Table 11**.

Table 11
City of Redmond
Comparison of Proposed SDCs by Meter Size to Existing SDCs

Meter Size	Reimbursement	Improvement	Credit	Compliance	Total	Equivalent	Existing SDC
5/8-inch	$1,165	$3,029	($188)	$81	$4,087	1	$2,105
3/4-inch	$1,747	$4,543	($282)	$121	$6,130	1.5	$3,158
1-inch	$2,912	$7,572	($470)	$202	$10,217	2.5	$5,263
1 1/2-inch	$5,825	$15,144	($940)	$405	$20,434	5.0	$10,525
2-inch	$9,320	$24,231	($1,504)	$647	$32,694	8.0	$16,840
3-inch	$18,640	$48,462	($3,008)	$1,294	$65,388	16.0	$33,680
4-inch	$29,124	$75,721	($4,700)	$2,023	$102,168	25.0	$52,625
6-inch	$58,249	$151,443	($9,400)	$4,045	$204,337	50	$105,250

SECTION 8: PARKS

The elements of the Parks Section include as follows:

1. Executive Summary from the City of Redmond 2030 Parks Master Plan Update (January 2008)
2. Capital Improvement Plan
3. CIP Map
4. SDC Analysis

SECTION 8-1: 2030 PARKS MASTER UPDATE EXECUTIVE SUMMARY

EXECUTIVE SUMMARY: 2030 PARKS MASTER PLAN UPDATE

January 2008

Part 1.0 Purpose of Update

This update to the *City of Redmond Parks Master Plan and Capital Improvement Plan* was undertaken in consideration of the steady population growth within Redmond and recent expansion of the City's Urban Growth Boundary (UGB). **The update sets the year 2030 as the target planning horizon, and anticipates Redmond's 2030 population to be 59,099.**

The general purpose of the plan is to:

- Update the previous plan by listing park improvements accomplished
- Identify and locate proposed new parks in relation to the UGB expansion. Establish a range of park types (e.g. neighborhood, community, special use), in compliance with agreed upon standards, and provide a listing of proposed amenities suitable and appropriate for both proposed and existing parks.
- Update the System Development Charge based upon the total acquisition and development costs associated with the plan. SDC funds will be used to pay for new parks and facilities related to growth, while other funds, including city general funds, grants, and contributions will be utilized to pay for existing facility upgrades and previously planned park projects.

The ultimate goal of the plan is to assure that the City of Redmond and its partners, the Redmond Area Park and Recreation District, (RAPRD), and the Redmond School District, offer a diverse, easily accessible park system that is responsive to the needs and desires of its citizens.

The Parks Master Plan/CIP Update, will be included by reference within the upcoming City of Redmond Public Facilities Plan which also includes Transportation, Water Service and Wastewater Service.

2.0 Methodology

The City contracted for the services of David Evans and Associates (DEA) to coordinate this plan update. DEA produced a series of five "Technical Memos" which provide specific information and data about each phase of the plan formulation process. A series of maps were produced to illustrate existing conditions, needs analysis, the Trails Master Plan, and locations of proposed parks, improvements and parkland acquisitions.

The City also enlisted the help of a citizen Public Advisory Committee (PAC) to assist with plan formulation and review. Further, the City chose to seek direct

public input about park use and park facility preferences by publishing a simple questionnaire, available both by mail and on-line. Citizen input was sought further during an "Open House" review of the draft plan. Specific questionnaire responses, and Open House comments are included as an appendix to this plan document, but in general **over 1,100 citizens offered comment during this planning process.** Further detail about how these responses and comments will be used, are incorporated throughout this document.

The plan formulation process included a series of steps typical to the planning process, these include:

- Review and update the inventory of existing park acreage and amenities, and factor previously adopted relevant Master Plan documents into the process. A complete inventory and profile of existing parks is found in *Section 2.0* of this plan.
- Determine need based upon an appropriate Level of Service Standard and Existing Level of Service currently in place. Produce a draft listing of proposed new parks and park amenities based upon shortfalls identified by applying need standards. *Technical Memoranda 2 and 3*, within *Section 3.0* of this plan, provides detail regarding Park Standards and Service Levels.
- Produce a Proposed New Park/Capital Improvement Plan list, incorporating acquisition and development costs, in order to propose an updated System Development Charge. The *Capital Improvement Plan* is provided *with Technical Memorandum 5* and a corresponding *CIP map* is included.

2.1 Trails Master Plan

The popularity of walking and biking among Redmond's citizens and high level of use associated with the Dry Canyon Trail, (as also borne out in public questionnaire responses), caused the City, for the first time, to include a proposal for a Trails Master Plan. The process for formulation of a draft trails plan was essentially the same process as outlined above. Emphasis was on the provision of additional Trail sections which would provide linkage to the existing Dry Canyon Trail. This linkage can be potentially provided by utilizing BPA power line and Irrigation District canal easement corridors. The most recent "Leadership Redmond" group helped formulate trail plans and identified feasible trail linkages, their help and support is greatly appreciated.

Technical Memorandum #4 provides detail associated with the formulation of the *Trails Master Plan*, but in summary, **the Plan proposes creation of an additional 23.8 trail miles, primarily to serve as connectors to the existing 2.9 mile Dry Canyon Trail**.

3.0 Redmond Standards

An important change from the previous plan update involved the decision to re-classify existing adjacent groupings of parks within the Dry Canyon (e.g. Sam Johnson, Spud Bowl, Bowlby, and Skate Park). Rather than classifying these as individual Neighborhood Parks or Special Use Parks, their value as closely linked amenities within the canyon was recognized, and they were re-classified as Community Parks, and specifically referred to as the Central Dry Canyon and South Dry Canyon Community Parks. This designation will facilitate appropriate coordinated planning and also recognizes the canyon's intrinsic park values and zones as identified in the adopted 1984 Dry Canyon Master Plan.

The proposed plan only establishes standards for Community and Neighborhood Parks since this is the primary role of the City as established in the Comprehensive Plan. However the plan acknowledges the need for Natural Resource Areas and Special Use Parks by including them specifically within the CIP listing.

Specifically the plan establishes the following standards:

Neighborhood Parks: Place within a ½ mile distance of every resident
Community Parks: Provide 4 acres for every 1000 Redmond residents

3.1 Amenity Standards

The park amenities considered in the plan were based upon localized interest levels, stated desires, and questionnaire responses. The plan recognizes that some amenities will be provided by the School District and RAPRD. A Park Amenity table and National Standards associated with each amenity is provided in *Technical Memorandum 2.*

4.0 2030 Proposed CIP Plan

The CIP spreadsheet targets park land acquisitions intended for proposed Neighborhood and Community Parks as well as for ongoing park land consolidation within the Dry Canyon. The smaller parcel canyon land acquisitions, which were carried over from the previous CIP, are important to facilitate ease of City management as well as to enhance Natural Resource values within the Canyon. Most of these will not be deemed as "attributable to growth" and are listed as candidates for donation to the Parks Foundation.

Costs associated with acquisition and development have been updated to consider inflation, and actual construction and acquisition costs.

Based upon recent input from the Parks Commission, Oasis Park will be strongly considered for liquidation, with funds from the sale potentially targeted for Phase II improvements within the new American Legion Park.

5.0 SDC Calculation

Early in the planning process, the PAC considered the inclusion of industrial and commercial lands within the SDC calculation, but after some evaluation, this idea was dropped because it was felt that the existing park system catered primarily to families and neighborhoods. The proposed SDC methodology will continue to be based upon simple residential calculation.

The Plan identifies park acquisition and development needs totaling 50.6 Million dollars. Seventy-Nine percent (79%) of this total is eligible for SDC funding while the remaining Twenty-One percent (21%) of these costs will be paid with other funds including City of Redmond General Funds and Grant funds. The System Development Charge Associated with this Plan Update, as calculated on the last page of the *Capital Improvement Plan Spreadsheet* is **$2,793**.

6.0 Conclusion

This proposed update to the Parks Master Plan/Capital Improvement plan was formulated with public involvement at various stages and levels, and is intended to reflect the needs and desires of the community. Redmond's citizens clearly treasure the range of recreational opportunities and values afforded them by the Dry Canyon and the park amenities found within the 17 City parks currently offered, but the importance of this plan lies in the fact that it takes the long view. Foresight in the face of steady growth, assures the opportunity to provide strategically located public parks, trails and green spaces, and consequently assures that community, family and individual benefits will be provided.

This update meets and compliments several of the 2007-2008 goals established by the Redmond City Council, including;

- Review and prioritize CIP and implement projects
- Extend the Dry Canyon Trail from Highland Avenue to Quartz Avenue
- Ensure Performance Stage is constructed in American Legion Park
- Complete Parks Master Plan
  - Construct American Legion Park
  - Review Central Canyon Master Plan

SECTION 8-2: PARKS CAPITAL IMPROVEMENT PLAN

RECOMMENDED 2030 Parks Capital Improvement Plan

Neighborhood Parks: Standard - Place a Neighborhood Park within a 1/2 Mile distance of every residence

Proj No.	Parcel No.	Project Title/Location	Project Description	Tax Map/Tax Lot	Acres to be Acquired (3-5 acres)	Acres Owned	2007 ACQUISITION COST	2007 DEVELOPMENT COST	Total	Percent Attributable to Growth	SDC Eligible Funding	Other Funding Needed	2007 AMENDMENT COMMENTS
N1	TBD	Neighborhood Park Site #1	Land Acquisition and Site Development		4.00		$800,000	$700,000	$1,500,000	100.00%	$1,500,000	$0	Avg. park size 3-5 acres. Development cost includes restroom, trees, turf, irrigation and general utilities
N2	TBD	Neighborhood Park Site #2	Land Acquisition and Site Development		4.00		$800,000	$900,000	$1,700,000	100.00%	$1,700,000	$0	Avg. park size 3-5 acres. Development cost includes restroom, trees, turf, irrigation and general utilities and Canyon Trail link from the Park to the Dry Canyon Trail at Spruce Avenue.
N3	TBD	Neighborhood Park Site #3	Land Acquisition and Site Development		4.00		$800,000	$700,000	$1,500,000	100.00%	$1,500,000	$0	Avg. park size 3-5 acres. Development cost includes restroom, trees, turf, irrigation and general utilities
N4	TBD	Neighborhood Park Site #4	Land Acquisition and Site Development		4.00		$800,000	$700,000	$1,500,000	100.00%	$1,500,000	$0	Avg. park size 3-5 acres. Development cost includes restroom, trees, turf, irrigation and general utilities
N5	TBD	Neighborhood Park Site #5	Land Acquisition and Site Development		4.00		$800,000	$700,000	$1,500,000	100.00%	$1,500,000	$0	Avg. park size 3-5 acres. Development cost includes restroom, trees, turf, irrigation and general utilities
N6	TBD	Neighborhood Park Site #6	Land Acquisition and Site Development		4.00		$800,000	$700,000	$1,500,000	100.00%	$1,500,000	$0	Avg. park size 3-5 acres. Development cost includes restroom, trees, turf, irrigation and general utilities
N7	EX	Existing Park Facility: Baker Park	ADA Improvements and Restroom			1.77		$66,480	$66,480	0.00%	$0	$66,480	
N8	EX	Existing Park Facility: Hayden Park	Complete Master Plan - ADA Improvements			3.02		$12,426	$12,426	0.00%	$0	$12,426	
N9	EX	Existing Park Site: Valley View	Site Development 50% Complete			10.30		$361,808	$361,808	59.00%	$213,467	$148,341	
			Sub-Total		**24.00**	**15.09**	**$4,800,000**	**$4,840,715**	**$9,640,715**		**$9,413,467**	**$227,248**	

Community Park Land Acquisition: To meet 2030 (59,099 buildout population) demand, an additional 124 acres to be acquired per Master Plan Recommendation

Proj No.	Parcel No.	Project Title/Location	Project Description	Tax Map/Tax Lot	Acres to be Acquired		2007 ACQUISITION COST		Total	Percent Attributable to Growth	SDC Eligible Funding	Other Funding Needed	2007 AMENDMENT COMMENTS
ACQ	C1	Elk Horn Area Community Park	Land Acquisition		20.00		$4,000,000		$4,000,000	100.00%	$4,000,000	$0	This 20 acre site may be split into two 10 acre Community Parks at locations to be determined upon development of Area Master Plans (zoning plan).
ACQ	C2	North Dry Canyon (S & H Group, Inc.)	Land Acquisition	141332 D 01600	5.20		$260,000		$260,000	100.00%	$260,000	$0	Part of UGB annexation: continuation of North Dry Canyon outside of city limits, within UGB
ACQ	C3	North Dry Canyon (Wilcox)	Land Acquisition	141332 D 01500	15.4		$770,000		$770,000	100.00%	$770,000	$0	Part of UGB annexation: continuation of North Dry Canyon outside of city limits, within UGB
ACQ	C4	North Dry Canyon (Hurst)	Land Acquisition	141332 D 01501	13.3		$665,000		$665,000	100.00%	$665,000	$0	Part of UGB annexation: continuation of North Dry Canyon outside of city limits, within UGB
ACQ	C5	North Dry Canyon (Elliott)	Land Acquisition	141333 00 01000	35.7		$1,785,000		$1,785,000	100.00%	$1,785,000	$0	Part of UGB annexation: continuation of North Dry Canyon outside of city limits, within UGB
ACQ	C6	Dry Canyon – Central (Eggleston)	Land Acquisition (Acquired 2006)	151309 CD 01801/1900	3.99		$425,000		$0	100.00%	$0	$0	Acquired 2006 for $425,000 (incl TL1900 - 3.99 acre total)
ACQ	C7	Dry Canyon – Central (Dunn)	Land Acquisition	151309 CC 00200	6.71		$2,400,000		$2,400,000	100.00%	$2,400,000	$0	Acquired in 2006, but financed $1.8M at 5.5% for 10-years. Acquisistion cost shown includes financing costs.
ACQ	C8	Dry Canyon – Central (Johnson)	Land Acquisition	151316 BB 00800	0.72		$25,200		$25,200	100.00%	$25,200	$0	
ACQ	C9	Dry Canyon – Central (Johnson)	Land Acquisition	151316 BB 00802	0.20		$7,000		$7,000	100.00%	$7,000	$0	
ACQ	C10	Dry Canyon – Central (Johnson)	Land Acquisition	151316 BB 00801	0.38		$13,300		$13,300	100.00%	$13,300	$0	
ACQ	C11	Dry Canyon – Central (Johnson)	Land Acquisition	151316 BB 00700	0.91		$31,850		$31,850	100.00%	$31,850	$0	
ACQ	C12	Dry Canyon – Central (Johnson)	Land Acquisition	151316 BB 00803	0.72		$25,200		$25,200	100.00%	$25,200	$0	
ACQ	C13	Dry Canyon – Central (Rea)	Land Acquisition	151316 BA 01504	0.35		$122,500		$122,500	100.00%	$122,500	$0	Acquisition cost of assumed residential lot pending M37 claim.
ACQ	C14	Dry Canyon – Central (Dean)	Land Acquisition	151316 BC 00102	1.00		$35,000		$35,000	100.00%	$35,000	$0	
ACQ	C15	Dry Canyon – Central (Gross)	Land Acquisition	151316 BC 00108	0.30		$10,500		$10,500	100.00%	$10,500	$0	

RECOMMENDED 2030 Parks Capital Improvement Plan

ACQ	C16	Dry Canyon – Central (Edwards)	Land Acquisition	151316 BC 00200	0.62		$21,700		$21,700	100.00%	$21,700	$0	
ACQ	C17	Dry Canyon – Central (Hutchens)	Land Acquisition	151316 BB 01200	0.90		$50,000		$50,000	100.00%	$50,000	$0	Partial purchase of portion within the Dry Canyon. Includes out-building.
ACQ	C18	Dry Canyon – South (Stonehedge)	Land Acquisition	151317 00 03102	17.00		$340,000		$340,000	100.00%	$340,000	$0	
ACQ	C19	Dry Canyon - South (Fields)	Land Acquisition	151316 CB 05200	0.43		$175,000		$175,000	100.00%	$175,000		Acquisition cost, less assumed $200,000 resale value of C4 portion
			Sub-Total		**123.83**		**$11,162,250**		**$10,737,250**		**$10,737,250**	**$0**	

Community Park Development: To meet 2030 (59,099 buildout population) demand, an additional 124 acres to be developed (standard: 4 ac/1000 pop).

Proj No.	Parcel No.	Project Title/Location	Project Description	Tax Map/Tax Lot	Acres remaining to be developed	Site Acreage		2007 DEVELOPMENT COST	Total	Percent Attributable to Growth	SDC Eligible Funding	Other Funding Needed	
CP-1	C2-C5, EX	North Canyon Community Park	Master Plan and Site Development		59.60	69.60		$4,470,000	$4,470,000	100.00%	$4,470,000	$0	70 +/- acre Community Park within North Dry Canyon. Assume development cost of $75k/ac and 50 developed acres. Includes Dry Canyon Trail extension cost to north UGB. Perhall ROW within Park Area = 10.0 acres
CP-2	C6-C7, C13, EX	Community Park Development Central Dry Canyon: Eggleston & Dunn	Master Plan (Highland to Fir) and Site Development		20.00	20.00		$1,500,000	$1,500,000	100.00%	$1,500,000	$0	Assume 20 developed acres and development cost of $75k/acre. Potential Community Center location.
CP-3	C17, EX	Community Park Development Central Dry Canyon: Spudbowl	Site Development (2.4 Undeveloped acres)		2.40	7.96		$180,000	$180,000	100.00%	$180,000	$0	Existing undeveloped portion of site
CP-4	C8-C12, C14-C16,	Community Park Development Central Dry Canyon: Sam Johnson	Site Development (9.5 undeveloped acres)		9.50	21.24		$712,500	$712,500	100.00%	$712,500	$0	
CP-5	EX	Community Park Development Central Dry Canyon: Bowlby Park	Fully developed with addition of 3rd softball field (In Process)		0.00	5.86		$0	$0	100.00%	$0	$0	Construct 3rd softball field (currently under construction in 2007)
CP-6	C1	Elkhorn Community Park	Master Plan and Site Development		20.00	20.00		$1,500,000	$1,500,000	100.00%	$1,500,000	$0	
CP-7	EX, C18	American Legion Park	Site Development of Phase II Improvements		2.00	11.00		$150,000	$150,000	100.00%	$150,000	$0	Phase II Improvements
CP-8	C19	American Legion Park	(0.32 undeveloped acres - TL 05200)		0.32	0.32		$200,000	$200,000	100.00%	$200,000	$0	Trailhead and access
CP-9	EX	Quartz Park	Site Development (10.0 undeveloped acres)		10.00	10.00		$750,000	$750,000	100.00%	$750,000	$0	Assume 10 developed acres and development cost of $75k/acre.
CP-10	EX	Umatilla	Site Development (2.0 Undeveloped acres)		0.00	10.64		$150,000	$150,000	100.00%	$150,000	$0	Constuct exterior path
CP-11	EX	Oasis Park	Master Plan and Site Development		0.00	7.26		$544,500	$544,500	0.00%	$0	$544,500	Candidate for liquidation or special use site
			Sub-Total		**123.82**			**$10,157,000**	**$10,157,000**		**$9,612,500**	**$544,500**	

Natural Resource Areas

Proj No.	Parcel No.	Project Title/Location	Project Description	Tax Map/Tax Lot	Acres	Acres Owned	2007 ACQUISITION COST	2007 DEVELOPMENT COST	Total	Percent Attributable to Growth	SDC Eligible Funding	Other Funding Needed	2007 AMENDMENT COMMENTS
ACQ	NR1	Dry Canyon - North (Eberhard et al)	Park Land Acquisition	151309 CA 00102	1.00		$0	$0	$0	0.00%	$0	$0	Non-acquisition piece. Candidate for charitable dedication to Parks Foundation.
ACQ	NR2	Dry Canyon - North (Stewart)	Park Land Acquisition	151309 AC 01400	1.86		$0	$0	$0	0.00%	$0	$0	Non-acquisition piece. Candidate for charitable dedication to Parks Foundation.
ACQ	NR3	Dry Canyon - Central (Portion of TL 151317-01508 Beals)	Park Land Acquisition	151317 00 01508	***		$0	$0	$0	0.00%	$0	$0	***Portion of tax lot within canyon. Non-acquisition piece. Candidate for charitable dedication to Parks Foundation.
ACQ	NR4	Dry Canyon - Central (Portion of TL 151317-01509 Beals)	Park Land Acquisition	151317 00 01509	***		$0	$0	$0	0.00%	$0	$0	***Portion of tax lot within canyon. Non-acquisition piece. Candidate for charitable dedication to Parks Foundation.
ACQ	NR5	Dry Canyon Central (Portion of TL 151316 BC 00102	Park Land Acquisition	151316 BC 00102	***		$0	$0	$0	0.00%	$0	$0	***Portion of tax lot within canyon. Non-acquisition piece. Candidate for charitable dedication to Parks Foundation.
ACQ	NR6	Dry Canyon Central (Portion of TL 151316 BC 106)	Park Land Acquisition	151316 BC 00106	***		$0	$0	$0	0.00%	$0	$0	***Portion of tax lot within canyon. Non-acquisition piece. Candidate for charitable dedication to Parks Foundation.
ACQ	NR7	Dry Canyon Central (TL 151316 BA 6301)	Park Land Acquisition	151316 BA 06301	0.32		$0	$0	$0	0.00%	$0	$0	Non-acquisition piece. Candidate for charitable dedication to Parks Foundation.
ACQ	NR 8	Dry Canyon Central (TL 151316 BA 05900)	Park Land Acquisition	151316 BA 05900	0.69		$0	$0	$0	0.00%	$0	$0	Non-acquisition piece. Candidate for charitable dedication to Parks Foundation.

RECOMMENDED 2030 Parks Capital Improvement Plan

ACQ	NR9	BLM Caves	Master Plan and Partial Site Development		40.00			$1,000,000	$1,000,000	0.00%	$0	$1,000,000	Joint City/BLM Project - Previously assigned $335,222 in SDC funding.
			Sub-Total					$1,000,000	$1,000,000		$0	$1,000,000	

Special Use Parks

Proj No.	Parcel No.	Project Title/Location	Project Description	Tax Map/Tax Lot	Acres	Acres Owned	2007 ACQUISITION COST	2007 DEVELOPMENT COST	Total	Percent Attributable to Growth	SDC Eligible Funding	Other Funding Needed	2007 AMENDMENT COMMENTS
SU-1	SU-1	Downtown Community Park East	Site Development		1.50	0.00	$1,625,000	$2,000,000	$3,625,000	0.00%	$0	$3,625,000	Per Downtown Development Plan; Funded with Urban Renewal Funds
SU-2	SU-2	Downtown Community Park West	Site Development		0.50	0.00	$550,000	$1,237,500	$1,787,500	0.00%	$0	$1,787,500	Per Downtown Development Plan; Funded with Urban Renewal Funds
SU-3	EX	Fireman's Pond	Site Development (0.5 undeveloped acres + Restroom		0.00	2.40		$300,000	$300,000	0.00%	$0	$300,000	Restroom and walking path
SU-4	EX	Maple Overlook (Hathaway Memorial)	Site Development and Dry Canyon Trail Access		0.57	0.57		$300,000	$300,000	0.00%	$0	$300,000	Community Park Expansion, including stair construction
			Sub-Total		**2.00**	**0.00**	**$2,175,000**	**$3,237,500**	**$5,412,500**		**$0**	**$5,412,500**	

Trails

Proj No.	Trail	Project Title/Location	Project Description	Tax Map/Tax Lot	Length to be developed			2007 DEVELOPMENT COST	Total	Percent Attributable to Growth	SDC Eligible Funding	Other Funding Needed	
T-1	T1	Trail Improvements	Pilot Butte Canal (COID)		5.30			$1,590,000	$1,590,000	59.00%	$938,100	$651,900	Estimated Development Cost $300,000/mile (including easement)
T-2	T2	Trail Improvements- Canal Trail Segments	Construct Trails Along COID Canal Laterals		14.00			$4,200,000	$4,200,000	59.00%	$2,478,000	$1,722,000	Estimated Development Cost $300,000/mile (including easement)
T-3	T3	Trail Improvements South Dry Canyon	Construct Trail from Highland to Quartz		0.00			$750,000	$750,000	0.00%	$0	$750,000	Funded by Grants - Includes Staircase
T-4	T4	Trail Improvements - BPA	Construct Trail Along BPA Right of Way Corridor		4.50			$1,350,000	$1,350,000	59.00%	$796,500	$553,500	Estimated Development Cost $300,000/mile (including easement)
T-5	T5	Trail Improvements On Street Connections	Constructed within Street Grid		0.00			$0		0.00%	$0	$0	
		Sub-Total	**Sub-Total**		**23.8**			**$7,890,000**	**$7,890,000**		**$4,212,600**	**$3,677,400**	

Amenities

Proj No.	Amenity #	Project Title/Location	Project Description	Tax Map/Tax Lot	# Required by Growth			2007 DEVELOPMENT COST (UNIT)	Total	Percent Attributable to Growth	SDC Eligible Funding	Other Funding Needed	
A1	A1	Park Amenity	Sports Fields: Youth Baseball or Softball combo with shared Soccer		34			$100,000	$3,400,000	100.00%	$3,400,000	$0	These amenities will be included in new parks as they are developed. They may be constructed on School District property pursuant to the City/School District IGA.
A2	A2	Park Amenity	Tennis Courts		9			$30,000	$270,000	100.00%	$270,000	$0	
A3	A3	Park Amenity	Swim Center		0			$0	$0	59.00%	$0	$0	
A4	A4	Park Amenity	Skate Park		0			$0	$0	59.00%	$0	$0	
A5	A5	Park Amenity	Picnic Shelters		7			$125,000	$875,000	100.00%	$875,000	$0	
A6	A6	Park Amenity	Tot Play Area		9			$30,000	$270,000	100.00%	$270,000	$0	
A7	A7	Park Amenity	Play Structure		14			$70,000	$980,000	100.00%	$980,000	$0	

RECOMMENDED 2030 Parks Capital Improvement Plan

A8	A8	Park Amenity	Frisbee/Disc Golf		0			$50,000	$0	59.00%	$0	$0	
A9	A9	Park Amenity	Ice Skating Rink		0			$3,500,000	$0	59.00%	$0	$0	
A10	A10	Park Amenity	Climbing Wall		0			$100,000	$0	100.00%	$0	$0	
A11	A11	Park Amenity	Off-Leash Dog Area		0			$50,000	$0	59.00%	$0	$0	
			Sub-Total						**$5,795,000**		**$5,795,000**	**$0**	

TOTALS

						2007 ACQUISITION COST	2007 DEVELOPMENT COST	Total	Percent Attributable to Growth	SDC Eligible Funding	Other Funding Needed	2007 AMENDMENT COMMENTS
				Neighborhood Park Subtotal:		$4,800,000	$4,840,715	$9,640,715		$9,413,467	$227,248	
				Community Park Land Acquisition Subtotal:		$11,162,250	$0	$10,737,250		$10,737,250	$0	
				Community Park Development Subtotal:		$0	$10,157,000	$10,157,000		$9,612,500	$544,500	
				Natural Resource Area Subtotal:		$0	$1,000,000	$1,000,000		$0	$1,000,000	
				Special Use Parks Subtotal:		$2,175,000	$3,237,500	$5,412,500		$0	$5,412,500	
				Trails Subtotal:		$0	$7,890,000	$7,890,000		$4,212,600	$3,677,400	
				Amenities Subtotal:		$0	$0	$5,795,000		$5,795,000	$0	
				TOTAL All Projects		$18,137,250	$27,125,215	$50,632,465		$39,770,817	$10,861,648	

PARKS SDC (per dwelling unit) = $2,793 Calculated as SDC Eligible Funding/14,240 dwelling units

Estimated Park Development Costs (2007 Costs)

Open Space/Preservation	$0 - $20,000 Acre
Urban Parks (1 Acre)	Site Specific
Neighborhood Park (3-5 Acre)	$200,000/Acre
Community park (5-plus Acres)	$75,000 - $150,000/Acre

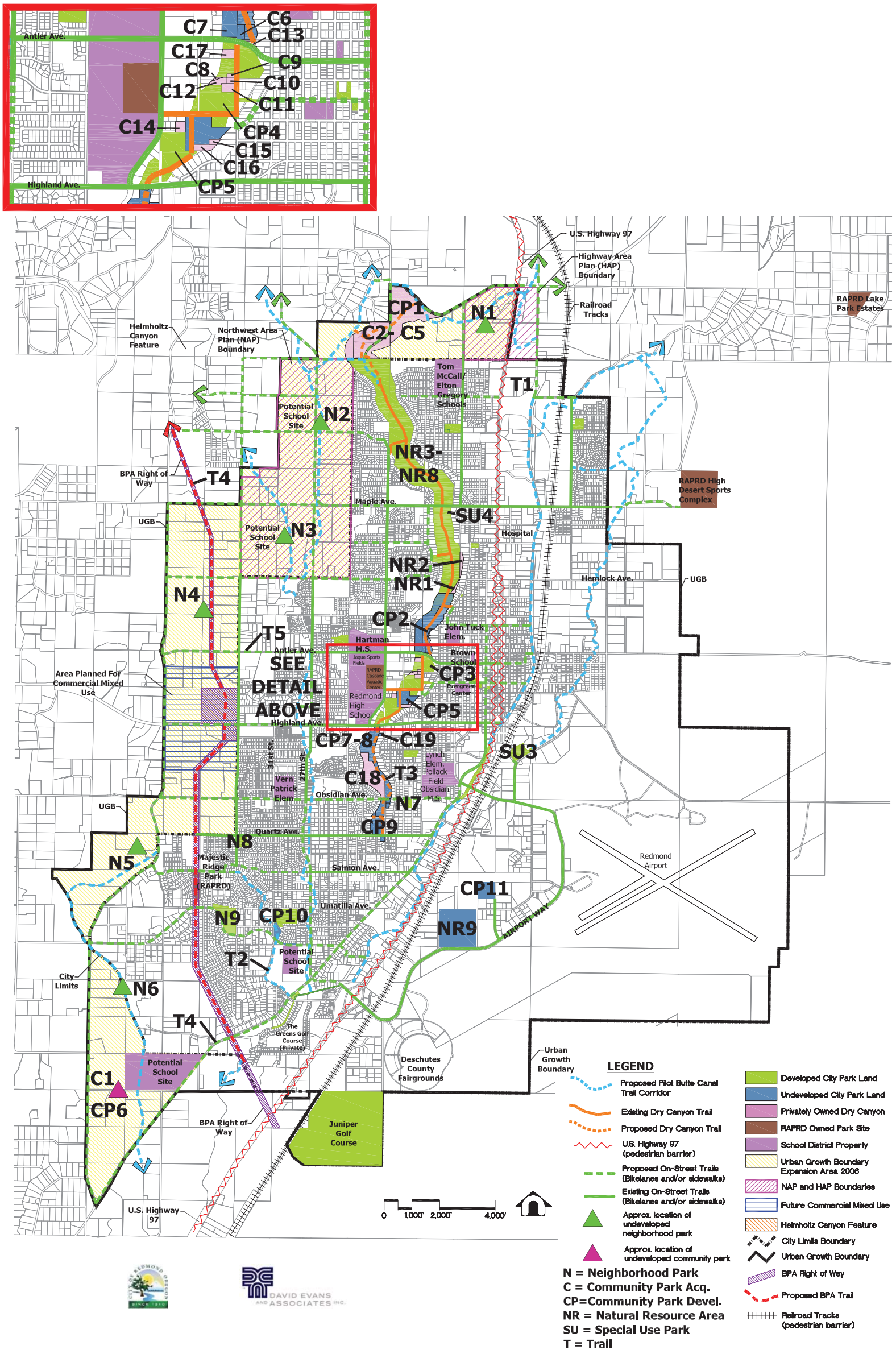
2007 PROPERTY ACQUISITION COSTS

RESIDENTIAL/NEIGHBORHOOD PARK = $200,000/AC
OSPR ZONE = $20,000 - $50,000/AC

Notes:

1. Cost estimates may vary depending on final park design.
2. Acquisition cost may vary depending on market condition.
3. SDC totals do not include RAPRD or School District projects.
4. SDC resources may be directed to construct Amenities on RAPRD or School District Property pursuant to IGA/MOU Agreements specifiying public use parameters.
5. Planned 2030 Buildout Population per Transportation System Plan land use analysis: 59,099 (23,500 in 2006 used as baseline)

SECTION 8-3: PARKS CIP MAP



2030 Capital Improvement Plan

City of Redmond

SECTION 8-4: PARKS SDC ANALYSIS

City of Redmond

UPDATE OF

PARKS SYSTEM DEVELOPMENT CHARGES

31 January 2008

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ECONOMIC & FINANCIAL ANALYSIS

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INTRODUCTION

The City of Redmond, through its prime contractor David Evans & Associates, retained Economic & Financial Analysis to update the parks system development charge (SDC).

This report contains an overview of Oregon's SDC laws, three sections on the SDC update, a new credit policy, and a new annual SDC updating policy to index the SDC to construction cost inflation.

SUMMARY

David Evans & Associates was retained by the City of Redmond to update the Parks Master Plan and the park system development charge. David Evans sub-contracted with Economic & Financial Analysis, a financial consulting firm, to update the City's parks system development charge (SDC).

This report uses the capital improvements list and other data from the Master Plan to update the City's parks SDC.

Table 1 shows the current and updated parks SDC. Overall, it increases from $834 per residence to $2,793, a 235 percent increase. As shown in Table 7 (page 7), this places Redmond's park SDC 13th of 45 cities surveyed in Oregon.

This update includes a revised credit policy that complies with ORS 223.297 through 223.314. It includes all mandated credits to developers who build a project or portions of a project included as a statutorily-defined qualified improvement on the capital improvements list. Both the existing and the updated system development charge is an improvement fee, only. It does not include a reimbursement fee.

Finally, a specific method is recommended to update the parks SDC annually for inflation. These annual adjustments for inflation will not require a public hearing.

Table 1 Current and Proposed Parks System Development Charge

	Current	Proposed	$ Change	% Change
SDC/capita		$1,117		
p/hh		2.5		
SDC/Housing unit	$834	$2,793	$1,959	70%

OVERVIEW OF OREGON'S SDC LAW

In 1989 the Oregon Legislature amended Oregon Revised Statutes Chapter 223 (ORS 223) which authorizes cities to assess Systems Development Charges (SDC) on new real estate developments for parks, parks, storm parks, parks, and transportation. Since then, the statute has been amended by nearly every Legislature including the last Legislature.

The amended ORS defines the SDC as:

> "A(4)(a) . . . a reimbursement fee, an improvement fee or a combination thereof assessed or collected at the time of increased usage of a capital improvement or issuance of a development permit, building permit or connection to the capital improvement. Systems Development Charge includes that portion of a … parks system connection charge that is greater than the amount necessary to reimburse the governmental unit for its average cost of inspecting and installing connections with parks … facilities."
>
> "A(b4) A Systems Development Charge does not include any fees assessed or collected as part of a local improvement district assessment or a charge in lieu of a local improvement district assessment, or the cost of complying with requirements or conditions imposed upon a land use decision or limited land use decision, expedited land division or limited land use decision."

The SDC may consist of a reimbursement fee, an improvement fee, or both.

The reimbursement fee is a capital charge for *existing excess capacity*. A reimbursement fee A...means a fee for costs associated with capital improvements already constructed or under construction [ORS 223.314 (3)]. In general terms, this fee equals the capital value of those components of the parks system that have excess capacity divided by their physical capacities.

The improvement fee is a capital charge for needed *future capacity* that the City must build to meet future demands. The planned improvements must be on a list of capital improvements that the City Council adopts and which the City Council by resolution may modify in the future. In general terms, this fee equals the expected cost of capital improvements needed to meet forecast demands divided by the capacity of the planned improvements. Notice that this fee cannot include capital improvements that repair existing problems. And if a specific capital improvement both fixes an existing problem and adds capacity, then the cost and capacity of the project is prorated so that the improvement fee includes only the capacity increasing portion.

The statute also establishes that certain system development charges and methodologies are prohibited (ORS 223.301). This section defines an employer as someone who hires employees and prohibits local governments from (a) charging its SDC on (a) the number of employees hired after a specified date, or (b) establishing a SDC ". . . methodology that assumes that costs are necessarily incurred from capital improvements when an employer hires an additional employee." The statute goes on to clarify than an SDC shall not be charges to ". . . include or incorporate any method or system under which the payment of the [reimbursement or improvement] fee or the amount of the fee is determined by the number of employees . . ."

The SDC statutes also require the city to have a credit policy for the improvement fee (but not for the reimbursement fee). Usually, when a developer builds an improvement on the list of capital improvements used to create the improvement fee, then the city must credit the developer for the cost of excess capacity of the improvement. The credit reduces the amount of the systems development charges owing on the development.

To qualify for a credit, a capital improvement must meet three conditions:

> First, the improvement must be on the list of capital improvements. If a project proposed for credit by a developer is not on the list then the project does NOT qualify for a credit. The City Council may amend the list of capital improvements by resolution.
>
> Second, the city must require the public improvement to be built as a condition of development approval. That is, the city must specifically state to the developer (preferably in writing) that unless the developer builds the improvement, the city will deny the proposed development permits to build.
>
> Third, the public improvement (or portions of it) must either be off-site of the proposed development or on-site and with more capacity than the development itself will utilize.

The City can use the SDC revenues only for capital improvements. The revenue from the reimbursement fee may be used on any parks-related capital improvement, including replacing existing components. The statutes restrict the City's use of revenue from the improvement fee to those improvements on the capital improvements list that increase capacity. The City cannot use improvement-fee revenue simply to replace existing facilities such as a parks line.

In the following analysis we develop the methodology for the parks reimbursement and improvement fees and present the list of capital improvements that becomes the basis of charging the improvement fee, spending improvement fee revenues, and crediting developers for completed qualified public improvements.

METHODOLOGY

The park SDC for Redmond will include only an improvement fee. The reimbursement fee would be near zero. Table 2 shows the currently developed, owned and to be acquired acres of park land by type of park. Except for Special Use parks, the number of acres of park land the City plans to acquire increases to meet current and future ratio of parks to population as shown in Table 3. The ratios increase for Neighborhood and Community parks, but these are off-set by decreases in the ratio for Natural Areas and Special Use parks. The total park ratio decreases only slightly from 17.19 acres per 1,000 population to 17.10 acres per 1,000 population, essentially no net change in the ratios of total acres to population. The increase in trail miles does not affect the acres of park land because trails will be built in the public right of way or on park property.

Table 2 Current and Proposed Park Acreage

		New Park Acres			
Type of Park	Developed Acres	To be Acquired	Owned	Total New	Total Build Out
Neighborhood	29.72	24.00	7.5	31.50	61.22
Community	32.66	123.83	74.94	198.77	231.43
Natural Resource	166.44	3.87	40.5	44.37	210.81
Special Use	184.27	2.00	0.57	2.57	186.84
Total	413.09	153.70	123.51	277.21	690.30

Trails	Miles Developed	To be built	Total Build Out
	3.75	23.8	27.55

Table 3 Ratio of Park Acres and Trail Miles to Population (in 1,000's)

	Acres/1,000 Population		
	2007	Build Out	
Type of Park	23,500	59,099	% Change
Neighborhood	1.26	1.04	-18%
Community	1.39	3.92	182%
Natural Resource	7.08	3.57	-50%
Special Use	7.84	3.16	-60%
Total	17.19	17.10	-1%
	Miles/1,000 Population		
Trails	0.16	0.40	152%

IMPROVEMENT FEE

The improvement fee is based on the cost of acquiring and developing new parks. Table 4 is a summary of the costs identified in the park master plan and the percentage of costs allocated to growth. All existing acres of park land, developed and undeveloped, are assumed to be owned by the City and the cost of acquiring that land is NOT included in Table 4. Only future costs associated with developing land currently owned by the City and the cost of acquiring more land is included in Table 4. In total the City's Park Plan is estimated to cost approximately $50.6 million to implement.

In summation, about 79 percent (approximately $39.77 million) of the planned park acquisition and development costs are allocated to growth. The remaining 21 percent (approximately $10.86 million) must be paid from non-SDC sources of revenue which may include grants, other City revenues, or other governments.

Table 5 shows the existing and future population of the City. Growth will increase the population by 59 percent. The park improvement fee is equal to the cost allocated to growth $39.77 million divided by the growth in population, 34,500, which equals $1,117. The SDC is assessed by housing unit and the average population per housing unit is 2.5 persons. The SDC per housing unit is $2,793 ($1,117 x 2.5 persons/housing unit), as shown in Table 6.

Table 4 CIP and Cost Basis for the Improvement Fee

	2007 ACQUISITION COST	2007 DEVELOPMENT COST	Total	Percent Attributable to Growth	SDC Eligible Funding	Other Funding Needed
Neighborhood Park Subtotal:	$4,800,000	$4,840,715	$9,640,715	98%	$9,413,467	$227,248
Community Park Land Acquisition Subtotal:	$11,162,250	$0	$10,737,250	100%	$10,737,250	$0
Community Park Development Subtotal:	$0	$10,157,000	$10,157,000	95%	$9,612,500	$544,500
Natural Resource Area Subtotal:	$0	$1,000,000	$1,000,000	0%	$0	$1,000,000
Special Use Parks Subtotal:	$2,175,000	$3,237,500	$5,412,500	0%	$0	$5,412,500
Trails Subtotal:	$0	$7,890,000	$7,890,000	53%	$4,212,600	$3,677,400
Amenities Subtotal:	$0	$0	$5,795,000	100%	$5,795,000	$0
TOTAL All Projects	$18,137,250	$27,125,215	$50,632,465	79%	$39,770,817	$10,861,648

Table 5 Growth of Population and Parks Demand

	People	Percent
Population 2007	23,500	40%
Growth	35,599	60%
Population Build Out	59,099	100%

Table 6 Proposed Parks System Development Charge

SDC/capita	$1,117
p/hh	2.5
SDC/Housing unit	$2,793

CREDIT POLICY

The City will provide a credit against the parks improvement fee according to ORS 223.304(4)(a). The City also will extend a credit whenever the cost of constructing a qualified public improvement exceeds the credit for the improvement fee to future phases of the same development as provided in ORS 223.304 (4)(b). The City will not allow for transferability of credits nor will the City provide credits for public improvements not on the capital improvements list. The City's list of capital improvements, unless amended in the future, includes the projects on Table 4 whose costs are included in the calculation of the SDC.

Whenever an applicant for a development or building permit offers to build a parks system improvement on the capital improvements list (those projects on Table 4 that are wholly or partially listed as eligible), the City must provide a credit for the value of the improvement. The credit may not exceed the value of the SDC improvement fee, and can be given only for the improvement fee portion of the SDC. No credit may be given for the reimbursement portion of the SDC. The City may credit up to 100 percent of the SDC under certain circumstances.

ORS 223.304 (3) and (4) define credits. A developer earns a credit by building a qualified public improvement (QPI). A QPI is a project that is (a) an improvement fee eligible on the parks CIP list (Table 4), (b) required as a condition of development approval, and either (c) off-site of the proposed development, or (d) on-site but required to be built larger than would satisfy the parks needs of just the proposed development (excess capacity).

The value of the credit is equal to (a) the cost of that portion of the improvement that exceeds the minimum standard facility size or capacity needed by the development, and (b) no more than the amount of the improvement fee. The portion of a parks system improvement that would be excess to a development would equal the ratio of capacity of the improvement less expected parks use in the proposed development divided by the capacity of the parks improvement.

ANNUAL UPDATES FOR INFLATION

ORS 223.304 (7) provides that,

> "A change in the amount of a reimbursement fee or an improvement fee is not a modification of the system development charge if the change in amount is based on the periodic application of an adopted specific cost index or on a modification to any of the factors related to rate that are incorporated in the established methodology."

For the purposes of periodically adjusting the parks SDC, the City will determine annually the increase in the 20-City Average Construction Cost Index (CCI) published in the weekly periodical *ENR* published by McGraw Hill, Inc. This publisher's construction (and building) cost index is widely accepted in the engineering and construction industry. *ENR* updates the CCI monthly and provides annual summaries in the July edition.

The formula for updating the SDC each year is as follows:

$$SDC_{current\ year} = SDC_{last\ year} \times (CCI_{current\ year} / CCI_{last\ year})$$

where:

$CCI_{current\ year}$	= Construction Cost Index for the current year
$CCI_{last\ year}$	= Construction Cost Index for the last year the SDCs were updated
$SDC_{current\ year}$	= the SDC updated by the CCI
$SDC_{last\ year}$	= the SDC to be updated

EFA recommends the City update the SDC annually and make the updated SDC effective January 1 of each year.

SECTION 9: SUMMARY RECOMMENDATION

SUMMARY OF PLANNING EFFORT

The goal of the PFP is to produce an infrastructure blueprint to guide the City as it develops from a current population of 24,805 (2007) to an ultimate buildout population of close to 60,000 residents (2030). The PFP is a culmination of all infrastructure master plans and their associated Capital Improvement Plans whereby the City is able to plan for growth and collect funds from growth to construct improvements to maintain acceptable levels of service within its Transportation, Water, Wastewater and Parks systems.

EXISTING SDC REVIEW

The City of Redmond previously approved a major revision to its PFP in 2001. In 2001, the City's planning horizon year was 2020 with a projected population of 35,845. The approved PFP in 2001 was the result of a revised population projection for Redmond, and was not the result of a major amendment to the City's UGB. The combined SDC per single family dwelling approved in 2001 was $4,755.

In 2002, the City revised the 2001 PFP, resulting in a new SDC in the amount of $6,819 per single family dwelling. In ensuing years, the PFP was amended annually through 2005 to account for inflationary increases. The City's current SDCs, in place since 2005 are shown below:

Existing System Development Charges

Category	*Unit*	*Existing Improvement Fee*	*Existing Reimbursement Fee*	*Existing Total*
Transportation	PM Peak Hr Trip	$2,877	$0	$2,877
Water	Equivalent Dwelling Unit	$1,924	$168	$2,092
Wastewater	Equivalent Dwelling Unit	$1,160	$945	$2,105
Parks	Dwelling Unit	$834	$0	$834
Total				**$7,908**

PROPOSED SYSTEM DEVELOPMENT CHARGES

Since 2001, the City of Redmond has experienced significant growth (approximately 6% average annual in preceding decade). In this time period, land prices have increased five fold in the Redmond area and material prices have significantly increased both locally and nationally due to the increasing cost of fuel, fuel products, and raw materials.

The proposed SDCs noted below reflect both an increase in the cost of construction (materials and land) as well as a significantly increased complexity in serving a substantial amount of additional planned growth primarily through expansion of existing utility corridors.

Proposed System Development Charges

Category	*Unit*	*Proposed Improvement Fee*[5]	*Proposed Reimbursement Fee*	*Proposed Total*	*% Increase from Existing*
Transportation	PM Peak Hr Trip	$4,685	$615	$5,300	84%
Water	Equivalent Dwelling Unit	$2,166	$453	$2,619	25%
Wastewater	Equivalent Dwelling Unit	$2,922	$1,165	$4,087	94%
Parks	Dwelling Unit	$2,793	$0	$2,793	235%
Total				**$14,799**	**87%**

Of particular note in the proposed SDCs, is the presence of a proposed Reimbursement Fee for Transportation. While prior City SDCs and their associated methodologies have included a Reimbursement Fee for Water and Wastewater, the Transportation SDC has not included a Reimbursement Fee component.

As noted, the collective SDC increase per growth unit (or single-family dwelling unit) is approximately 85%.

IMPLEMENTATION PROPOSALS

The proposed SDC rates noted above represent a significant increase to existing SDC rates. While the PFP purports that failure to collect the full portion of each SDC over the long term will result in an undercollection of funds needed to construct planned infrastructure improvements necessary to serve anticipated growth, a short term (2-3 year period) phase-in schedule could be accomodotated with out significant long term funding shortfalls.

The TSP and Parks PAC committees have discussed or recommended phasing-in full implementation of the proposed SDCs in an effort to soften the collective impact of a whole-sale increase.

Specific implementation phase-in proposals as well as comparative SDC data from other Oregon communities will be made available for City Council consideration at time of adoption.

[5] Including appropriate compliance charges, etc.