

Methodology Report

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# Water System Development Charges

Prepared For  
City of Sherwood

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# Introduction

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Oregon legislation establishes guidelines for the calculation of system development charges (SDCs). Within these guidelines, local governments have latitude in selecting technical approaches and establishing policies related to the development and administration of SDCs. A discussion of this legislation follows, along with the methodology for calculating updated water SDCs for the City of Sherwood (the City) based on the recently completed Water System Master Plan Update (Murray Smith & Associates, 2015).

## 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:

- Drainage 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 with 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 capital improvements or the repayment of

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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. The notification requirements for changes to the fees that 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 (CIP) 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.

# Water SDC Methodology

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## Overview

The general methodology used to calculate water SDCs begins with an analysis of system planning and design criteria to determine growth's capacity needs, and how they will be met through existing system available capacity and capacity expansion. Then, the capacity to serve growth is valued to determine the "cost basis" for the SDCs, which is then divided by the total growth capacity units to determine the system wide unit costs of capacity. The final step is to determine the SDC schedule, which identifies how different developments will be charged, based on their estimated capacity requirements.

## Determine Capacity Needs

**Table 1** shows the planning assumptions for the water system contained in Water System Master Plan Update (Master Plan). The primary relevant design criteria for the water system is Maximum Day Demand (MDD), which is the highest daily recorded rate of water production in a year. MDD is the primary factor in evaluating capacity for source, transmission and treatment facilities.

**Table 1** shows the existing maximum day demand (MDD) for the system and the projected total and growth requirements at various years and build-out. As shown in **Table 1**, the current MDD is about 3.9 mgd. Through development saturation, the City's water demand is projected to increase by an additional 5.1 mgd to 9 mgd total. Future growth is projected to represent about 56 percent of future MDD.

**Table 1**  
City of Sherwood SDC Analysis  
*Water System Capacity Analysis*

| Time Period                                     | MDD<br>Total | MDD<br>Growth |
|---|--------------|---------------|
| <b>Current (mgd)<sup>1</sup></b>                | 3.9          |               |
| <b>Future Projections<br/>(mgd)<sup>1</sup></b> |              |               |
| 2024  | 4.8          | 0.9           |
| 2034  | 6.0          | 2.1           |
| <b>Saturation</b>                               | <b>9.0</b>   | <b>5.1</b>    |
| Equivalent Meters <sup>2</sup>                  | 7,074        |               |
| <b>Use per Equiv Meter (gallons)</b>            | <b>556</b>   |               |

<sup>1</sup> From Water System Master Plan Update (Table 2-7)

<sup>2</sup> From City of Sherwood billing records

MDD = Max Day Demand

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Table 1 also shows the estimated water use per equivalent unit, where the units are based on equivalent meters. Equivalent meters represent the number of meters in the system, stated in terms of the relative hydraulic capacity of each meter size to that of the smallest meter (a 5/8-inch meter). The water system currently has about 5,700 meters; applying a hydraulic capacity equivalent to each meter size results in a total of 7,074 equivalent meters. Dividing the current MDD of 3.93 by the current equivalent meters yields a MDD per equivalent meter of 556 gallons.

## Develop Cost Basis

The capacity needed to serve new development will be met through a combination of existing available system capacity and additional capacity added by 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 is referred to as the “cost basis”. **Table 2** shows the City’s capital project list – including existing projects (or work in process) and future planned improvements.

### Reimbursement Fee Cost Basis

**Table 2** includes the list of existing system facilities that were considered for the SDC analysis. These facilities include existing wells, the City’s portion of the Willamette River Water Treatment Plant (WRWTP), storage reservoirs (and associated pumping facilities) in zones 380 and 455, and major transmission lines. For these existing facilities, the growth portion of costs is determined by future development’s share of the current facility capacity, as follows:

- **Wells:** The City’s existing wells are used solely for emergency supply purposes. Based on system planning criteria, the existing wells do not have excess capacity for growth.
- **Willamette River Water Treatment Plant:** The City currently owns 5 mgd of the WRWTP. Current development capacity requirements are 3.93 mgd (from Table 1); therefore, 1.07 mgd (21 percent) is available to serve future growth.
- **Storage Reservoirs and Pumping:** The Master Plan found existing storage capacity to be adequate to meet the needs of existing and future development through build-out. Existing storage facility costs are allocated to growth based on equivalent dwelling units, as estimated from the Master Plan. As shown in Table 2, the growth allocation equals 53 percent (zone 380) and 70 percent (zone 455).
- **Transmission:** The City constructed transmission pipes to deliver water from the WRWTP to the City’s system. A portion of the piping is sized for 40 mgd, while other segments have a 20-26 mgd capacity. The portion of the capacity that will serve demand beyond the projected Urban Growth Boundary (UGB) is excluded from the analysis. The City may be reimbursed for this oversizing capacity cost by future regional water supply partner(s).

**Table 2**  
 City of Sherwood SDC Analysis  
 Water System SDC Project List

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| Component                            | Capacity |       | Capacity Need |        | Cost Allocation |        | Updated Study Cost  |                             |                     |                  | SDCr Cost           | SDCi Cost           |
|--------------------------------------|----------|-------|---------------|--------|-----------------|--------|---------------------|-----------------------------|---------------------|------------------|---------------------|---------------------|
|                                      | Units    | Value | Current       | Future | Current         | Future | Included cost       | Excluded Costs <sup>1</sup> | Total Costs         | Improvement Year |                     |                     |
| <b>Supply</b>                        | mgd      |       |               |        |                 |        |                     |                             |                     |                  |                     |                     |
| Wells (3,5 &6)                       |          |       |               |        | 100%            | 0%     | \$854,072           |                             | \$854,072           | Completed        | \$0                 |                     |
| Wells 3 Hydrants                     |          |       |               |        | 100%            | 0%     | \$25,000            |                             | \$25,000            | 2014/15          |                     | \$0                 |
| Well 4                               |          |       |               |        | 100%            | 0%     | \$25,000            |                             | \$25,000            | 2014/15          |                     | \$0                 |
| Water Treatment Plant (WTP)          |          | 5     | 3.93          | 1.07   | 79%             | 21%    | \$7,584,047         |                             | \$7,584,047         | Completed        | \$1,622,986         |                     |
| WTP Upgrades                         |          | 5     | 3.93          | 1.07   | 79%             | 21.4%  | \$1,000,000         |                             | \$1,000,000         | 2019/2024        |                     | \$214,000           |
| WTP intake capacity purchase         |          | 5     | 0             | 5      | 0%              | 100%   | \$2,000,000         |                             | \$2,000,000         | 2019/2024        |                     | \$2,000,000         |
| WTP Plant Expansion                  |          | 5     | 0             | 5      | 0%              | 100%   | \$7,700,000         |                             | \$7,700,000         | 2019/2024        |                     | \$7,700,000         |
| <b>Storage</b>                       |          |       | EDUs          |        |                 |        |                     |                             |                     |                  |                     |                     |
| 380 Ft zone (Sunset #1)              |          |       | 6,857         | 7,591  | 47%             | 53%    | \$651,274           |                             | \$651,274           | Completed        | \$342,180           |                     |
| 455 Ft zone (Kruger)                 |          |       | 816           | 1,943  | 30%             | 70%    | 3,159,543           |                             | \$3,159,543         | Completed        | \$2,225,079         |                     |
| 380 Zone Reservoir (Sunset #2)       |          |       | 6,857         | 7,591  | 47%             | 53%    | \$10,009,076        |                             | \$10,009,076        | Completed        | \$5,258,783         |                     |
| <b>Pumping</b>                       |          |       |               |        |                 |        |                     |                             |                     |                  |                     |                     |
| Wyndham (455)                        |          |       | 816           | 1,943  | 30%             | 70%    | 693,653             |                             | \$693,653           | Completed        | \$488,499           |                     |
|                                      |          | gpm   | gpm           |        |                 |        |                     |                             |                     |                  |                     |                     |
| Ladd Hill (535 PRV)                  |          | 1,600 | 0             | 1,600  | 0%              | 100%   | \$477,000           |                             | \$477,000           | 2019             |                     | \$477,000           |
| Kruger (630 zone)                    |          | 2,400 | 0             | 2,400  | 0%              | 100%   | \$2,547,000         |                             | \$2,547,000         | Saturation       |                     | \$2,547,000         |
| Edy Road (455 Booster)               |          | 1,600 | 0             | 1,600  | 0%              | 100%   | \$1,505,000         |                             | \$1,505,000         | Saturation       |                     | \$1,505,000         |
| <b>Transmission</b>                  | Total    |       | mgd           |        |                 |        |                     |                             |                     |                  |                     |                     |
| Finished Water Transmission - Pipe   | 40       | 10    | 3.93          | 6.07   | 39%             | 61%    | \$6,566,214         | \$5,159,169                 | \$11,725,383        | Completed        | \$3,985,692         |                     |
| Finished Water Transmission - Pipe   | 26       | 10    | 3.93          | 6.07   | 39%             | 61%    | \$1,962,076         | \$1,962,076                 | \$3,924,152         | Completed        | \$1,190,980         |                     |
| Finished Water Transmission - Pipe   | 20       | 10    | 3.93          | 6.07   | 39%             | 61%    | \$826,113           | \$826,113                   | \$1,652,225         | Completed        | \$501,450           |                     |
| 380 Zone Reservoir Line              | 40       | 10    |               |        | 47%             | 53%    | \$503,328           | \$395,472                   | \$898,800           | Completed        | \$264,449           |                     |
| Segment 3                            | 20       | 10    | 3.93          | 6.07   | 39%             | 61%    | \$908,295           | \$908,295                   | \$1,816,590         | Completed        | \$551,335           |                     |
| Tualatin/Sherwood 24"                |          |       |               |        |                 | 0%     | \$0                 |                             | \$9,579,882         | Completed        | \$0                 |                     |
| <b>Distribution</b>                  |          |       |               |        |                 |        |                     |                             |                     |                  |                     |                     |
| Immediate                            |          |       |               |        | 100%            | 0%     | \$171,000           |                             | \$171,000           | 2014/15          |                     | \$0                 |
| 5-Year                               |          |       |               |        | 0%              | 100%   | \$1,974,000         |                             | \$1,974,000         | 2019             |                     | \$1,974,000         |
| 10-Year                              |          |       |               |        | 0%              | 100%   | \$5,575,000         |                             | \$5,575,000         | 2024             |                     | \$5,575,000         |
| 20-Year                              |          |       |               |        | 0%              | 100%   | \$3,295,000         |                             | \$3,295,000         | 2034             |                     | \$3,295,000         |
| Beyond 20 Years                      |          |       |               |        | 0%              | 100%   | \$7,183,000         |                             | \$7,183,000         | Saturation       |                     | \$7,183,000         |
| Distribution Replacement Program     |          | 9     | 3.93          | 5.07   | 44%             | 56%    | \$1,000,000         |                             | \$1,000,000         | 2034             |                     | \$563,333           |
| SCADA System                         |          | 6     | 3.93          | 2.07   | 66%             | 35%    | \$75,000            |                             | \$75,000            | 2019             |                     | \$25,875            |
| PRVs                                 |          |       |               |        | 0%              | 100%   | \$600,000           |                             | \$600,000           | Saturation       |                     | \$600,000           |
| Water Management & Conservation Plan |          | 6     | 3.93          | 2.07   | 66%             | 35%    | \$300,000           |                             | \$300,000           | 2018/2034        |                     | \$103,500           |
| Vulnerability Assessment             |          | 6     | 3.93          | 2.07   | 66%             | 34.5%  | \$120,000           |                             | \$120,000           | 2024/2034        |                     | \$41,400            |
| Resiliency Plan                      |          | 6     | 3.93          | 2.07   | 66%             | 35%    | \$300,000           |                             | \$300,000           | 2024/2034        |                     | \$103,500           |
| <b>Total</b>                         |          |       |               |        |                 |        | <b>\$69,589,691</b> | <b>\$9,251,124</b>          | <b>\$88,420,697</b> |                  | <b>\$16,431,434</b> | <b>\$33,907,608</b> |

<sup>1</sup> Excludes costs above minimum pipe size required for retail customers

The included transmission cost<sup>1</sup> is allocated between current development and future growth based on the projected share of future 10 mgd capacity (39 percent existing and 61 percent growth). The cost basis excludes the \$9.6 million 24" Tualatin/Sherwood line that is currently not planned for use within the City's system.

The total cost of existing facility capacity allocated to growth is almost \$16.4 million, as shown in **Table 2**.

### Improvement Fee Cost Basis

Planned future capacity-increasing improvements are also shown in Table 2. System capacity may be expanded through the upgrade of existing facilities or the construction of new facilities. The basis for future growth allocations include:

- **WRWTP and Future Water Purchases:** The City's current share of WRWTP capacity (5 mgd) is sufficient to meet the needs of existing development; therefore the costs of future intake capacity purchase and WRWTP expansion (additional 5 mgd) are allocated entirely to future growth. Performance-related upgrades at the WRWTP are allocated between existing and future development in proportion to the use of the existing 5 mgd City-owned capacity.
- **Pumping:** The Water System Master Plan Update recommendeds three additional pump stations to meet future demands. The improvements are needed entirely for future growth.
- **Distribution:** Immediate distribution improvements address existing fire flow capacity deficiencies, and are therefore, not included in the SDC cost basis. Improvements in future years are needed to extend the system for future development, and are therefore 100 percent SDC eligible. The distribution replacement program is allocated between existing and future development based on share of future MDD. Distribution system costs are excluded from the reimbursement fee cost basis discussed previously. However, future development will benefit from existing system distribution system, so a portion of the future replacement costs are included in the improvement fee cost basis.
- **SCADA system improvements and planning** costs have been identified only through 2034; therefore, the growth allocation is pro-rated to the 2034 future demand (6 mgd total; which growth represents 2.1 mgd, or about 35 percent).

**Table 2** indicates that the total costs of the growth-related capital improvements over the planning period are \$33.9 million.

### SDC Schedule

The reimbursement and improvement unit costs of capacity are determined by dividing the reimbursement and improvement fee cost bases, by the growth-related capacity defined in

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<sup>1</sup> The included cost is equal to the estimated cost of a 36" transmission line; the minimum pipe size required to serve customers within the UGB.

Table 1. The unit costs are stated in terms of dollars (\$) per gallon of water demand. **Table 3** shows these calculations.

**Table 3**  
City of Sherwood SDC Analysis  
*Water System SDC Unit Costs*

|                               | Total          | Reimbursement | Improvement  |
|-------------------------------|----------------|---------------|--------------|
| Growth Cost                   | \$50,339,042   | \$16,431,434  | \$33,907,608 |
| Growth Requirements (gallons) |                | 5,070,000     | 5,070,000    |
| Unit Cost (\$/gallon)         |                | \$3.24        | \$6.69       |
| Demand per EDU (gallons)      |                | 556           | 556          |
| SDC per EDU                   | \$5,516        | \$1,801       | \$3,715      |
| Compliance Costs              | \$75.53        |               |              |
| <b>Total SDC per EDU</b>      | <b>\$5,592</b> |               |              |

As indicated in **Table 3**, the cost bases are divided by the 5.1 mgd projected future system capacity, and the resulting unit cost (\$/gallon) for reimbursement and improvement are \$3.24 and \$6.69, respectively.

SDC fees are then calculated by multiplying the unit cost of capacity by the capacity requirements of an equivalent meter (or EDU). As indicated in Table 1, the MDD for an EDU is 556 mgd. The resulting SDC per EDU for reimbursement and improvement is \$1,801 and \$3,715, respectively, and the combined SDC is \$5,516.

### Compliance Costs

Local governments are entitled to include in the SDCs, a charge to recover costs associated with complying with the SDC statutes. Compliance costs include costs related to developing the SDC methodology and project list (i.e., a portion of facility planning costs), and annual accounting and administrative costs. **Table 4** shows the calculation of the compliance charge per EDU, which is estimated to be \$75.53.

**Table 4**  
City of Sherwood  
*Estimated Water SDC Compliance Costs*

| Item                     | Cost      | SDC % | Frequency (Years) | Annual   |
|--------------------------|-----------|-------|-------------------|----------|
| SDC Study <sup>1</sup>   | \$7,500   | 100%  | 5                 | \$1,500  |
| Master Plan <sup>2</sup> | \$150,000 | 56%   | 10                | \$8,450  |
| Staff Accounting         | \$403     | 100%  | 1                 | \$403    |
| Financial Management     | \$2,772   | 100%  | 1                 | \$2,772  |
| Engineering              | \$1,142   | 100%  | 1                 | \$1,142  |
| Accounting               | \$448     | 100%  | 1                 | \$448    |
| Total Compliance Costs   |           |       |                   | \$14,716 |
| Estimated Annual EDUs    |           |       |                   | 195      |
| Cost per EDU             |           |       |                   | \$75.53  |

<sup>1</sup>Includes both outside consulting fees and internal staff costs

<sup>2</sup>Based on growth's share of future MDD

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## Revised Fee Schedule

The total SDC (including compliance charge) for a 5/8" meter is \$5,592. As with 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"). The current and revised SDC schedule is show in **Table 5**.

**Table 5**  
City of Sherwood SDC Analysis  
*SDC Schedule*

| <b>Meter Size</b> | <b>EDU</b> | <b>SDCi</b> | <b>SDCr</b> | <b>Compliance</b> | <b>Total SDC</b> | <b>Current</b> |
|-------------------|------------|-------------|-------------|-------------------|------------------|----------------|
| 5/8"              | 1          | \$3,715     | \$1,801     | \$76              | \$5,592          | \$6,726        |
| 3/4"              | 1.5        | \$5,573     | \$2,701     | \$113             | \$8,387          | \$10,089       |
| 1"                | 2.5        | \$9,289     | \$4,501     | \$189             | \$13,979         | \$16,817       |
| 1.5"              | 5          | \$18,577    | \$9,003     | \$378             | \$27,958         | \$33,634       |
| 2"                | 8          | \$29,724    | \$14,404    | \$604             | \$44,732         | \$53,812       |
| 3"                | 17.5       | \$65,021    | \$31,509    | \$1,322           | \$97,852         | \$117,714      |
| 4"                | 30         | \$111,465   | \$54,015    | \$2,266           | \$167,746        | \$201,794      |
| 6"                | 62.5       | \$232,218   | \$112,532   | \$4,721           | \$349,471        | \$420,405      |
| 8"                | 90         | \$334,395   | \$162,046   | \$6,798           | \$503,238        | \$605,383      |