

Multnomah County Drainage District No. 1



Overview of Alternative Assessment Methodology Study



Final Report

January 20, 2004



INTEGRATED
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GROUP, INC.



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PI38.033.SW

Doug Ross
Financial Director
Multnomah Drainage District No. 1
1880 N.E. Elrod Dr.
Portland, OR 97211

Subject: **Final Report--*Overview of Alternative Assessment Methodology Study***

Dear Mr. Ross:

Enclosed please find the final report of our *Overview of Alternative Assessment Methodology Study* for Multnomah County Drainage District No. 1 (District). This final report reflects the comments and input from District staff, the members of the Special Commission, and your landowners.

Thank you again for the opportunity to assist the District in this important process. Please feel free to contact Kerstin Rock or me with any further questions.

Sincerely,

INTEGRATED UTILITIES GROUP, INC.

A handwritten signature in blue ink, appearing to read 'Paul L. Matthews', with a stylized flourish at the end.

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Executive Summary

Multnomah County Drainage District No 1. (District) retained Integrated Utilities Group, Inc. (IUG) to conduct a comprehensive study of alternative assessment methodologies. Specifically, the purpose of our study was to identify, calculate, and evaluate alternative assessment methodologies and recommend a fair and equitable assessment methodology that meets the District's goals.

Using the approach presented in this report, IUG developed the following recommendations:

1. Adopt Methodology C as described in Section 3:
 - Eliminate the sub-basin charges from the assessment methodology.
 - Eliminate elevation benefit from the assessment methodology and instead base the recovery of flood control costs on acreage.
 - Recover peak-stormwater costs based on impervious area.
 - Recover average-stormwater costs based on total lot area.
2. Review cost allocations annually and recommend changes when necessary.
3. Have the District Board of Supervisors approve the cost allocations on an annual basis.
4. Have the District Board of Supervisors approve costs allocation percentages and cost recovery methods for IGA-related costs.

Section 1: Introduction

This report presents an overview of the alternative assessment study conducted by Integrated Utilities Group, Inc. (IUG) for Multnomah County Drainage District No. 1 (District).

Overview of Report

The report is in four sections including this one. Section 2 provides an overview of the District. Section 3 provides a detailed discussion of our study, including the following:

- Selection of evaluation criteria,
- Selection of methodologies,
- Analysis of alternative assessment methodologies,
- Study findings.

Based on these findings, we present our recommendations in Section 4. Following Section 4 is a glossary of technical terms and abbreviations used throughout this report. Appendix A presents a brief description of common implementation issues and IUG's recommendations on handling these issues. Our analysis is based on cost allocations provided by District staff. Appendix B to this report documents these allocation percentages. Appendix C presents an overview of the assessment process. This includes the steps necessary to reproduce the assessments using the proposed methodology. Sample calculations of assessments are included in Appendix D. Also, an electronic copy of the assessment model is provided in Appendix E.

Purpose

The District's current assessment methodology was adopted by the Multnomah County Board of Commissioners in June of 1989. In 2003, the District conducted a detailed review of its assessment methodology and the District's actual application of the methodology. The results of this review indicated that the District's approach to calculating the actual assessments did not meet the adopted methodology in two areas. First, the adopted methodology includes a provision that the District recovers costs related to sub-basins directly from the properties located within those sub-basins. Second, the District currently applies a \$25 minimum charge to all parcels

under one acre. The review further suggested that some of the data underlying the calculation was outdated or erroneous.

In addition, the District's primary land use has continuously shifted from undeveloped agricultural land to primarily developed residential and industrial land. In addition to the diversification of development patterns within the District, the District also experienced changes in its operational needs. Due to these reasons, the District Board of Commissioners and its landowners requested an update of the current assessment methodology. This report documents the process followed in fulfilling this request.

The purpose of this study is to identify, calculate, and evaluate alternative assessment methodologies and recommend a fair and equitable assessment methodology that meets the District's goals.

Scope of Services

The District retained IUG to conduct an overview of alternative assessment methodologies. The tasks included in this study were:

1. A discovery task to review the District's current assessment methodology.
2. Establish evaluation criteria suitable for the District.
3. Identify and select appropriate cost drivers.
4. Identify and select appropriate cost recovery methods.
5. Identify suitable alternative assessment methodologies.
6. Document the selection of alternative assessment methodologies identified for analysis in a technical memorandum and submit this technical memorandum to the District for review and comment.
7. Calculate assessments for each alternative assessment methodology.
8. Evaluate the selected assessment methodologies based on the District's evaluation criteria and make a recommendation for the most appropriate assessment methodology.
9. Prepare a detailed study report documenting the study and our recommendations.

10. Prepare a spreadsheet model to calculate the District's annual assessments that integrates error protection and data integrity measures such as error checks and macros.

Acknowledgements

We would like to thank the District staff for its assistance throughout this study. Specifically we would like to thank Doug Ross, Dave Hendricks, and Bob Eaton for their assistance. We would also like to thank Eileen Eakins of Jordan Schrader P.C., and David Crawford of Crawford Engineering Associates for their assistance throughout the course of the study.

Section 2: Overview of the District

Geographical Description

The District is located in Multnomah County (County), along the left bank of the Columbia River between river miles 108.2 and 119.0, approximately 10-15 miles east of the city center of Portland. The drainage district includes 8,832 acres, of which 465 acres are lakes and sloughs, and 200 acres are farmland, Portland International Airport, Blue Lake Park, 3 golf courses, small industrial enterprises, and suburban development. Land elevation ranges from 10 to 30 National Geodetic Vertical Datum (NGVD). The District area averages about 1 mile in width with the Union Pacific Railroad and U.S. Highway No. 30 paralleling the south boundary. The eastern boundary adjoins Sandy Drainage Improvement Company by a cross levee paralleling Campbell Road and opposite river mile 119.0, while on the western side Peninsula Drainage Canal separates the district from Peninsula Drainage District No. 2.

Governance of District

The District is established under ORS Chapter 547, which outlines the organization and authority of the State's drainage districts. It is governed by a three-person Board of Supervisors whose members are elected by vote of the District's landowners. Other authority is established through selected federal, state and local guidelines, statutes and regulations related to the operation and maintenance of a public flood control and stormwater conveyance system. The District's ratepayers meet annually for a landowner meeting while the Board of Supervisors have meetings scheduled monthly.

Services Provided

The District provides its customers with many services including river flood protection, stormwater conveyance and management, environmental and regulatory compliance, etc. However, as the land use within the District has become more diverse and development has increased significantly, the amount of stormwater flows the District has to handle have increased significantly. In addition to providing its landowners with flood protection, the District's other focus is to provide its landowners with stormwater services.

In order to provide the District landowners with the needed services, the District incurs costs. These costs must be recovered from the District's landowners in a fair and equitable manner. For instance, the District incurs ongoing operation and maintenance costs (O&M) and debt service costs related to outstanding bonds. The District recovers the O&M and capital costs in two separate assessments that are included in the annual Multnomah County property tax statements.

Assessment Review Process

The process of updating an assessment methodology is referred to under ORS 547 as the *reassessment of benefits*. This process is initiated by a signed petition from the District's landowners presented to the County Commissioners. The County Commissioners, after verifying landowner's signatures, appoints a *Special Commission* to make a recommendation to the County Commissioners for changes to the adopted assessment methodology. The Special Commission charge is to take public comment and draft a report for the County Commissioners consideration. The County Commissioners, after receiving the Special Commission's report, take public comment and vote on acceptance of the new assessment methodology. With a favorable vote by the County Commissioners, the new assessment methodology is implemented the following assessment year.

Section 3: Overview of Assessment Methodology Selection Process

Overview of Process

The process of identifying the most appropriate assessment methodology for the District can best be conceptualized as a four-step process. Figure 3-1 illustrates this process.

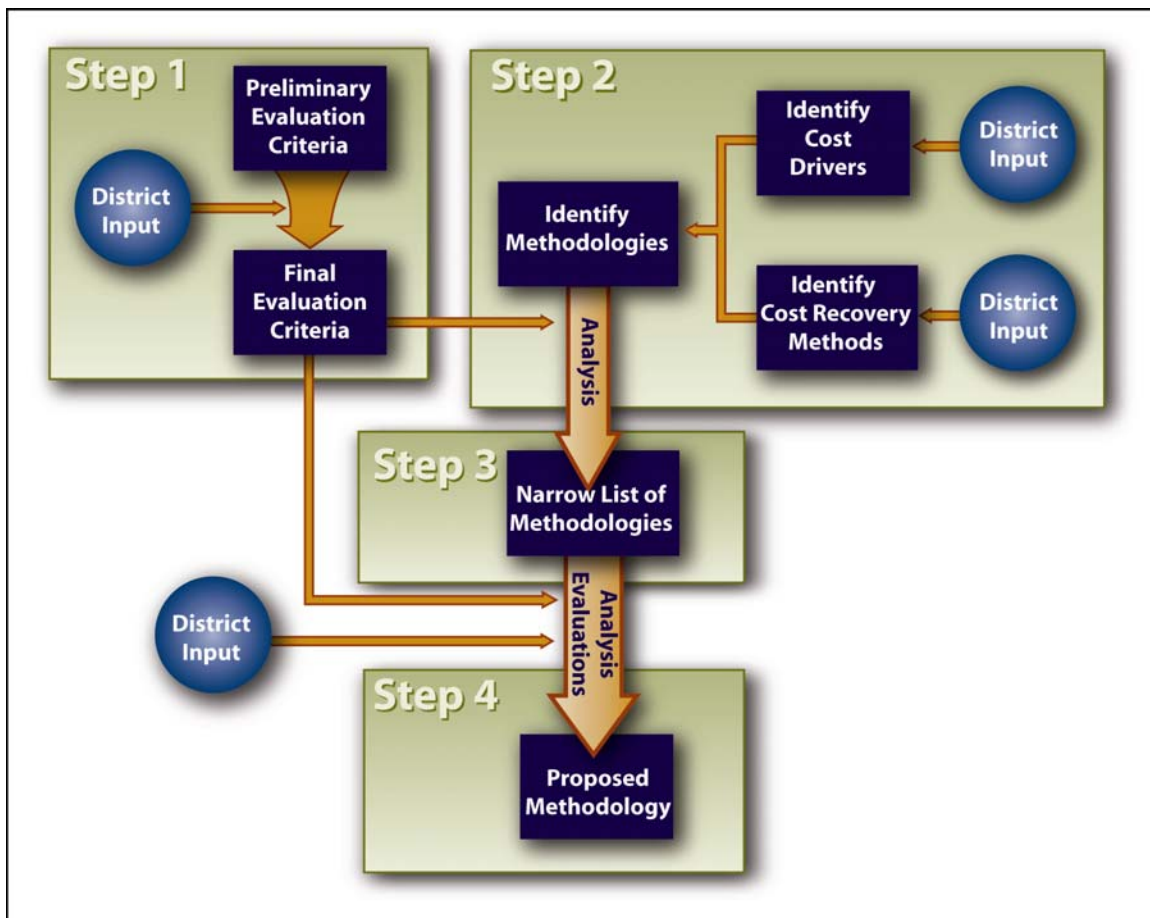


Figure 3-1

Step 1 consisted of the development of evaluation criteria that can be used to objectively evaluate the alternative assessment methodologies. Using the evaluation criteria developed in Step 1, in Step 2 the project team then identified and selected relevant cost drivers (e.g., flood control, stormwater management, etc.) as well as the selected appropriate cost recovery methods for each cost driver. Working closely with District staff, the project team then identified five alternative assessment methodologies for further analysis. During Step 3, IUG developed separate spreadsheet models to calculate the assessments under each of the five alternative methodologies. After finishing the initial calculations, IUG, in association with District staff, used the evaluation criteria to reduce the number of alternatives for further analysis from five to two. Step 4 focused on conducting additional analyses for the two selected alternative assessment methodologies and evaluating each based on the District's evaluation criteria. Based on our evaluations, IUG selected the proposed assessment methodology.

Following is a description of the key tasks completed in each of the four steps.

Step 1: Develop Evaluation Criteria

An objective evaluation of alternative assessment methodologies requires the development of appropriate evaluation criteria. These criteria should encompass the issues surrounding the development, selection, and implementation of the new assessment methodology. Based on an extensive list of possible evaluation criteria, IUG and District staff identified seven criteria that were most reflective of District's goals for the new assessment methodology. Of the seven criteria all but one, rate shock, were evaluated based on qualitative assessment. Rate shock, a measure of the financial impact of an assessment methodology, is evaluated using data generated as part of analytical phase of this study. Following is a brief description of each criterion.

Equity: Equity can be viewed from two different frameworks: *cost-of-service* and *value-of-service*. The cost-of-service approach focuses on the recovery of the actual cost incurred by the District in providing its services. The value of service approach, as suggested by its name, focuses on recovering costs in proportion to the value received by the District's property owners.

The cost-of-service framework considers a methodology *more equitable* if customers pay for their fair share of system cost in proportion to their use of the system. In other words, a methodology is equitable when the "cost causer" is the "cost payer". When evaluating the equity of a methodology, IUG evaluates whether each type of customer assumes their fair share without receiving or providing subsidies from and/or to other property owners.

The value-of-service framework focuses on capturing the differences in the value of service provided by the District to the landowners. According to this

framework, a methodology is more equitable if the differences in the received value are properly accounted for in the cost recovery method.

Rate Shock: Rate shock, the only quantitative evaluation criteria selected for the District, measures the number of customers that encounter a significant increase or decrease in their assessments as the result of using an alternative assessment methodology. Given that the recovery of costs within the District is a zero sum game, this criterion seeks to quantify the number of winners and losers for each methodology. Specifically, this criterion is defined to measure the percentage of the customers that would see more than a 10 percent increase or decrease in their annual assessments. Because large and sudden changes in assessments can impose significant economic difficulties on businesses and residents, a methodology will rank higher under this criterion if the amount of rate shock is minimized.

Public Understanding: Ideally, customers should understand the assessment methodology. Customers should also be able to see the connection between the attributes of their property and how those attributes translate into their annual assessments. Therefore, less complex methodologies are typically easier to understand and therefore rank higher than methodologies that are more complex.

Public Acceptance: The proposed assessment methodology should be one that the public will accept. Public acceptance typically is related to the degree of public understanding and the perception of whether or not a methodology is *fair*.

Legal Defensibility: The proposed assessment methodology must be legally defensible.

Administrative Burden: Administrative burden is an informal measure of the resources and time required to maintain and update a methodology. On an on-going basis, the assessment methodology should be administered in the most cost-efficient manner.

Adaptability: The adaptability criterion captures the degree of flexibility a methodology provides the District in incorporating future changes of its operations and financial situations without having to update the entire methodology. A good example of when such flexibility would be needed is if the District enters into future intergovernmental agreements (IGA). To account for this possibility, the methodology should be flexible enough to allow the equitable allocation of costs and/or revenues associated with future IGAs without requiring the District to go through another complete assessment review process.

Other Evaluation Criteria Considered

In the process of selecting the most appropriate evaluation criteria for the District, the project team considered additional evaluation criteria that, after careful consideration, were deemed better handled in other ways (e.g., in the annual budgeting process and the District's budget policies). In addition, some of the criteria are less important for the specific purpose of selecting an assessment methodology for the District. Following is a list of evaluation criteria that were considered but not included in the analysis:

- Affordability
- Revenue stability
- Revenue sufficiency
- Comparison with other communities
- Rate stability and predictability

Step 2: Identify Alternative Assessment Methodologies

Select Cost Drivers

The District provides multiple services to the landowners located within its jurisdiction such as river flood control, stormwater management and conveyance, etc. Another way of thinking of these services is that each of the District's services represents a separate cost driver.

Following our review of the District's actual costs and their relative importance, IUG, with input from District staff, identified the most important cost drivers. Given the current operation and management of the District, the following three cost drivers were identified based on their overall contribution to the District's costs:

1. Stormwater Management and Conveyance
2. Intergovernmental Agreements
3. Flood Control

Figure 3-2 shows a breakdown of the District's 2003 operating costs reflecting these three major cost drivers.

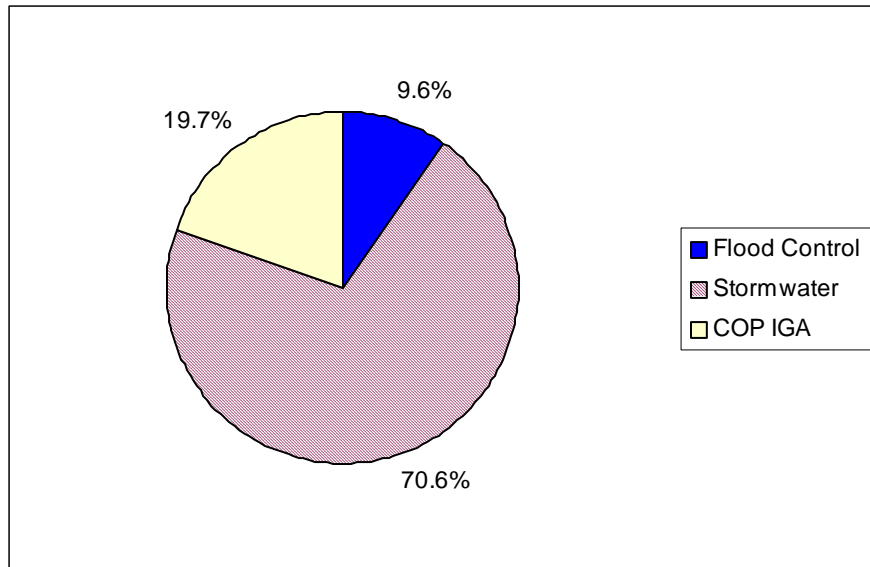


Figure 3-2

Following is a description of each of the three cost drivers.

Stormwater Conveyance and Management

In order to control stormwater levels within its service area, the District operates and maintains a stormwater collection, conveyance, and pumping system. The purpose of these systems is to manage the quantity of stormwater that accumulates inside the District's system of levees and prevent back-up flooding of properties within the District. As such, the District's system is designed to meet both average and peak stormwater flows for a 100-year event. Average flows are defined as the flows of a 2-year rain event as determined by the National Oceanic and Atmospheric Administration (NOAA). Peak flows are those flows that are due to development and impervious area, and thus increase runoff intensity.

As previously mentioned, stormwater-related costs make up the majority of the District's costs and thus the treatment of stormwater costs will drive the majority of the assessments.

Intergovernmental Agreement

The District provides services to customers living in five different jurisdictions (City of Portland, City of Gresham, City of Fairview, Multnomah County, and Wood Village). However, due to the topography of the District and its surrounding areas, some stormwater from outside the District as well as from state and city streets flows into the District. State law allows the District to assess applicable charges for such runoff. In addition to run-off, other issues related to sharing jurisdiction with other entities can have significant financial impacts on the District, both in the form of revenues and costs. The District currently has multiple IGAs, for example with the City of

Portland and Oregon Department of Transportation (ODOT). IGAs by their nature can vary significantly in their underlying rationales, cost drivers, revenue drivers, and negotiated terms. For example, the District currently has an IGA with the City of Portland that accounts for the services provided by both entities. Some of the services covered in the District's IGA with the City of Portland include environmental management, stormwater maintenance, and transportation system-related stormwater management.

Based on the costs related to the District's current IGAs, this cost driver accounts for approximately 30 percent of the District's total costs. The District's current IGA costs can further be broken down into stormwater-related costs and environmental costs. As Figure 3-3 illustrates, stormwater-related IGA costs represents approximately 12 percent of the District's total costs while costs related to environmental programs account for roughly 18 percent of total system costs.

River Flood Control

Due to the District's proximity to the Columbia River and the lower Columbia Slough, a tributary to the Willamette River, one of the major services provided by the District is flood control. The District provides flood control by maintaining a system of levees surrounding the District. The District is responsible for meeting U.S. Army Corps of Engineers' flood control and engineering standards for all federal levees located in the District. Based on the District's costs, costs related to flood control account for approximately 10 percent of the District's total costs.

Figure 3-3 presents a breakout of the District's total costs for Fiscal Year ending 2004 (FY2004)¹, including O&M and debt service costs. The figure shows that the majority (70.6 percent) of the current costs are related to stormwater management and conveyance. Adding the stormwater-related portion of the intergovernmental agreement (IGA) costs, stormwater-related costs compose approximately 82.4 percent of the District's O&M and debt service costs. The remainder of the costs, 9.6 percent and 7.9 percent, are related to flood control and environmental programs, respectively.

¹ The District's fiscal year runs from July 1 through June 30. This report refers to fiscal years by proceeding the year in which the fiscal year ends by "FY". For example, the fiscal year that runs from July 1, 2003 through June 30, 2004 is referred to as "FY2004."

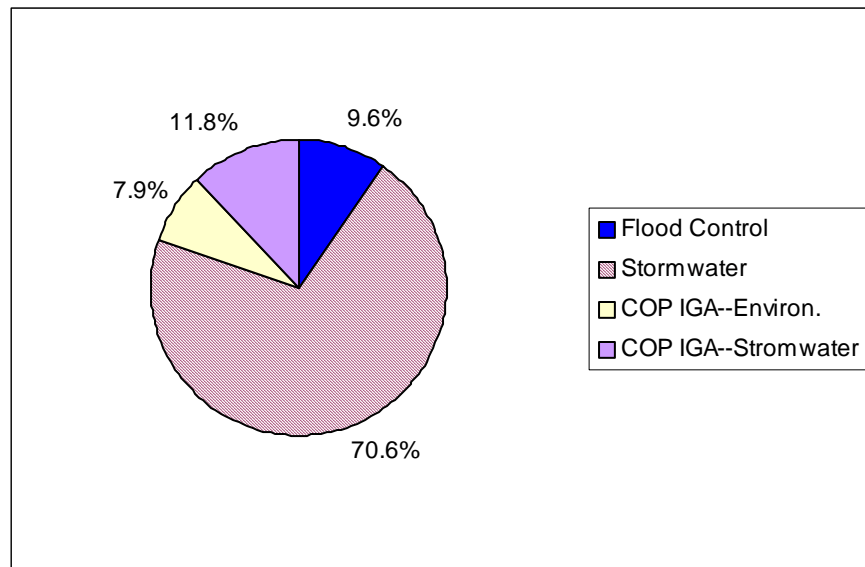


Figure 3-3

Figures 3-4 presents the District's O&M costs by cost driver.

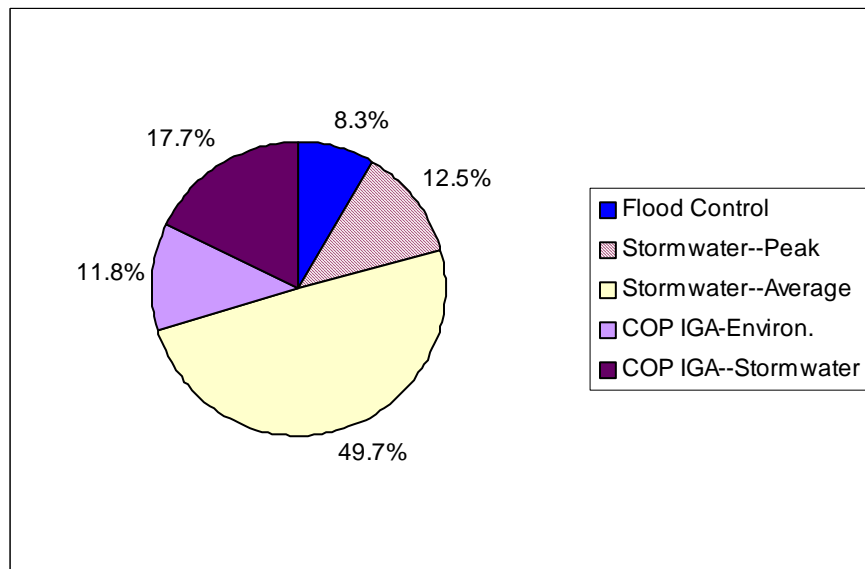


Figure 3-4

Figure 3-5 summarizes the District's debt-related costs by cost driver. Based on the cost allocations provided by District staff, 87.6 percent of the District's cost related to outstanding bonds is related to peak stormwater flows, while the remaining 12.4 percent is related to the provision of flood control.

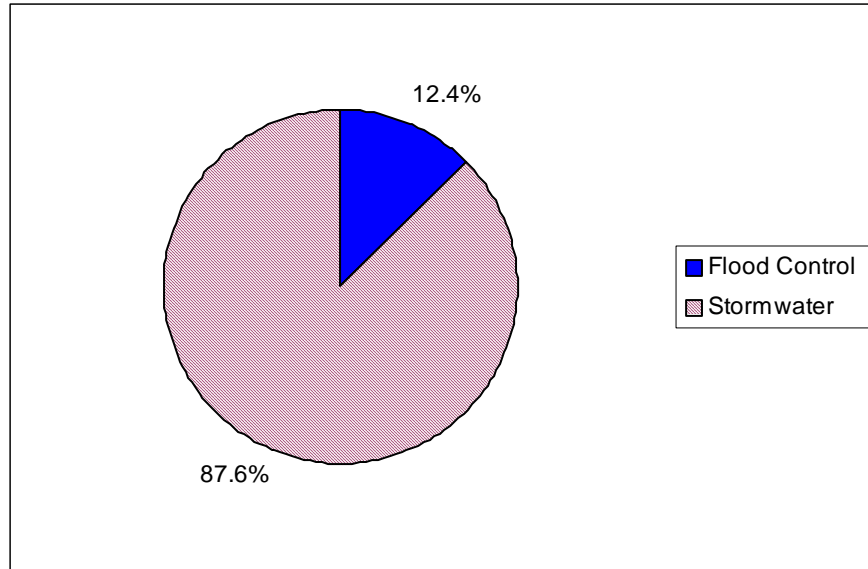


Figure 3-5

The figures show that the importance of the cost drivers for the O&M and debt service costs differ significantly.

In addition to the three cost drivers listed above, the District's current methodology identifies sub-basin costs as an additional cost driver. Figure 3-6 shows the District's costs according to the cost allocations used in the current assessment methodology.

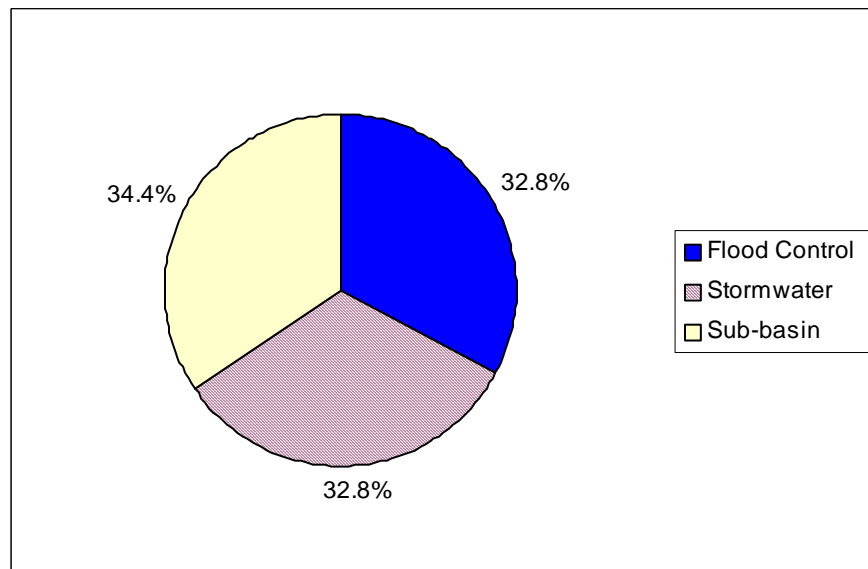


Figure 3-6

As will be discussed in detail later in this section, IUG recommends eliminating sub-basins as a cost driver from the District's methodology. However, because one of the alternative methodologies considered in this

analysis is the District's current methodology, sub-basin costs are included in our discussion on cost drivers.

Sub-Basins

The District's service area is divided into multiple sub-basins. The definitions of the District's sub-basins are based on engineering and system design criteria that reflect the overall system management needs of the District. As such, the sub-basins do not reflect natural hydrological phenomena but rather are engineered and designed, depending on the District's needs at the time. The District's service area is currently divided into six sub-basins:

- Pump Station #1,
- Pump Station #2,
- Pump Station #4,
- Broadmoor,
- NE 181,
- Fairview Lake.

Out of the six sub-basins, Pump Station #1 and Pump Station #4 are part of the general system that is used in the overall management of the District while the remaining four sub-basins identify areas that require additional capital improvements to provide stormwater service within a unique sub-basin. For some of the sub-basins, the District maintains pumping stations specifically for stormwater within that sub-basin. The District's current methodology considers these sub-basins special drainage benefit areas and requires that the costs related to providing the special drainage benefit within a sub-basin be borne by the properties located within the sub-basin. Specifically, the methodology requires that the costs related to the special drainage benefit areas be recovered based on each benefiting property's proportionate share of the total gross acreage within the benefited sub-basin. If the Fairview Lake sub-basin were to be considered for assessment, it would include some major costs. These major costs would include the maintenance and improvements of the weir and dam located on the west side of Fairview Lake.

Based on our review of the facts relating the sub-basins, IUG considers the current assessment methodology for sub-basins as inequitable for the following reasons:

- The sub-basins are based on the engineering and design needs of the District rather than actual characteristics and requirements of the properties located within the sub-basins.

- The boundaries of the sub-basins can change over time and thus impact different tax lots simply based on their location. Recovering the costs related to a specific sub-basin from the tax lots located within the sub-basin would be analogous to charging people adjacent to a bridge for the entire cost of the bridge. Based on information provided by the District's engineering staff, sub-basins are considered part of the overall stormwater system operated by the District and are not treated as individual service areas. Thus, similar to the case of a transportation system where all residents pay a share of the entire transportation network, the sub-basins costs should be recovered from all customers proportionally.
- The costs related to the three sub-basins are substantial. Based on the 2004 total assessments adopted by the District Board of Supervisors, the costs associated to sub-basins are approximately \$700,000. Table 3-1 presents the total costs (O&M and debt-service related) allocated to each sub-basin as well as the number of acres and tax lots located in each sub-basin. As the right-hand column of the table shows, the impact of recovering the specific sub-basin costs only from the customers located within the sub-basin are substantial.

Subbasin	Cost	Acres	Number of Tax Lots	\$/Acre
PS #2	\$315,399	672.7	61	\$468.86
Broadmoor	274,725	904.6	31	303.69
NE 181	66,028	77.2	11	855.00
Total	\$656,152	1,654.6	103	

Table 3-1

Based on these reasons, IUG recommends that the sub-basin no longer be considered a separate cost driver.

Other Cost Drivers Considered

Similar to the process of selecting the appropriate evaluation criteria out of a larger set of feasible criteria, IUG and District staff first analyzed many cost drivers, regardless of importance. Using each cost driver's percentage of total system costs as an indicator for importance, the project team selected the three cost drivers discussed previously. The following cost drivers were considered but not included in this study because of their relative small impact on the District's costs or the fact that they were already accounted for in one of the three other cost drivers:

- Customer Billing
- Project Review
- Regulatory Compliance.

Identify Cost Recovery Methods

Following the selection of cost drivers, the next task involved identifying viable options for recovering the costs related to each cost driver. As part of a project team meeting, IUG presented the District with a range of possible cost recovery methods. Considering the District's operational and management practices as well as the key objectives of the District (e.g., equity), IUG and the District identified the cost recovery methods most relevant to each cost driver. The cost recovery methods considered for this purpose include:

- **Per Acre:** Recovers costs based on each tax lot's proportional share of total assessable acreage in the District.
- **Per Square Foot of Impervious Area:** Recovers costs based on the amount of impervious area of the tax lot. Impervious area is defined as the amount of land generating run-off such as parking lots, rooftops, sidewalks, etc.
- **Elevation Benefit:** Incorporating the value of service concept, elevation is based on both elevation thresholds and elevation benefit weights associated with each threshold. The costs are then recovered based on each customer's acreage weighted by elevation benefit.
- **Per Tax Lot:** Recovering costs on a per tax lot basis simply divides costs by the total number of assessable tax lots and charges each tax lot equally.
- **Based on Jurisdiction:** This cost recovery method was included primarily for the purpose of recovering IGA-related costs. Given that the District shares jurisdictions with other entities, recovering costs by jurisdiction would calculate a credit or a surcharge for the tax lots located within a specific jurisdiction.
- **Indirectly:** Indirect costs are recovered from other cost drivers in proportion to the allocation of the other cost drivers. For example, if 20 percent of the non-indirect costs are recovered based on acreage and 80 percent are recovered based on impervious area, then the indirect costs would be recovered proportionally based on the 80/20 split of costs.
- **Per Customer:** Similar to recovering costs on a per tax lot basis, recovering costs per customers divides total system costs by the number of customers in the District and assigns each customer an identical charge. The per customer cost recovery method differs from the per tax lot basis only if the definition of *customer* accounts for one customer owning more than one tax lot. Because the District assesses each tax lot individually, the inclusion of this cost recovery method was deemed redundant and was thus excluded from the analysis.

- **Property Value:** This cost recovery method recovers costs based on the property value of each tax lot. However, given restrictions on property taxes in Oregon, this cost recovery method was deemed inappropriate for this analysis and thus excluded.

Based on assistance from District staff, the project team identified the viable cost recovery methods for each of the District's cost drivers. Table 3-2 provides a summary of the feasible options identified.

Feasible Cost Recovery Methods					
	Cost Drivers				
	Flood	Stormwater		IGA	Subbasin
Cost Recovery Method	River Flood Control	Conv. & Mgmt. (Peak Flow)	Conv. & Mgmt. (Average Flow)		
Per Acre	X	X	X	X	X
Per Imp. Area		X	X	X	X
Elevation	X			X	
Per Tax Lot	X	X	X	X	
Jurisdiction				X	
Indirect				X	X
Key: X.....Feasible Approach Blank...Not Possible or Unused Approach					

Table 3-2

Identify Alternative Methodologies

Considering the possible combinations of cost drivers and cost recovery methods as well as the District's goals, IUG, in association with District staff, identified five assessment methodologies (A through E) for further analysis.

Regardless of the methodology, however, the method of collecting the District's assessments will be the same, namely as assessments on each property owner's annual property tax bill.

Methodology A represents the currently adopted assessment methodology that recovers all costs not assigned specifically to one of the 3 sub-basins, 50 percent based on elevation benefit and 50 percent based on impervious area. Costs allocated to sub-basins are recovered based on each customer's proportion of acreage in a specific sub-basin.

The four alternative methodologies developed by the project team differ from the current methodology in the following four elements:

1. Historically, sub-basin boundaries have been based on natural geographical formations. Over time, the operational and engineering needs of the District have required changes in these boundaries. For instance, rather than expanding a pump station in a particular sub-basin to accommodate additional flows within that sub-basin, the flows are frequently rerouted and thus sub-basins are redefined to save costs and ensure effective operation of the District. IUG considers the direct allocation of all costs associated to a particular sub-basin to only those properties located within its boundaries as inequitable. Thus, IUG recommends that sub-basins no longer be considered a separate cost driver.
2. Cost allocations are based on the actual cost of operating and managing the District's system instead of the 50/50 cost split between flood control and stormwater was set in the current methodology.
3. In order to make the proposed methodology flexible enough to deal with future IGAs that the District may adopt, IUG recommends that the District's Board of Supervisors review each IGA and determine appropriate allocation percentages and cost recovery methods on a case-by-case basis. It is important to note that an IGA can cover different revenues and costs. As such, the Board would have to approve allocations for both costs and revenues to the appropriate cost drivers and determine the most appropriate cost recovery method for each.

The only IGA considered as a separate cost driver in this study is the District's IGA with the City of Portland. This IGA covers a variety of services provided by each entity that is specific to tax lots located within the joint jurisdiction of the City of Portland and the District. For instance, the IGA specifies the amount the City of Portland pays to compensate the District for providing stormwater services to the City of Portland residents and the City's transportation system. Similarly, the IGA specifies the amount paid by the District to compensate the City for environmental and other stormwater-related services provided. For the purpose of this study and specific to the City of Portland IGA, IUG assumes that the Board, applying the same evaluation criteria as defined in this report, would consider recovering the stormwater and environmental components of the City of Portland IGA based on impervious area and acreage, respectively.

4. All customers will be charged based on the actual square footage of their properties². All peak stormwater-related costs will be based on the actual impervious area of the property. However, for the majority

² Although ORS 547.455 contains a discussion on a minimum lot size, the District maintains that this discussion is not applicable in this circumstance.

of the District's residential lots, such data do not yet exist. IUG recommends that the District have all residential lots measured. We further recommend that the District review and update its impervious area data every 3 to 5 years.

Other than that, Alternatives B and C are based on the cost-of-service framework. As such, neither of the two alternatives uses elevation benefit as a cost driver. In contrast, Alternatives D and E partially incorporate the value-of-service framework by including elevation benefit as one of the cost recovery methods.

Following is a detailed description of each methodology including the allocation approach and the assessment methodology design.

Methodology A: Status Quo

Based on our understanding of its adopted methodology, the District's costs are separated into sub-basin specific costs and all other costs. The costs specific to a sub-basin are intended to be recovered from the property owners in that sub-basin in proportion to their share of acreage of the sub-basin. The remaining costs are assumed to be split 50/50, and are recovered 50 percent based on the elevation benefit of the property and 50 percent based on the impervious area.

The current methodology uses five elevation benefit zones to assign benefit weights to each property. These zones are:

1. **Zone 1:** (Less than 10 feet) is assigned a benefit weighting of 0 percent.
2. **Zone 2:** (Between 10 feet and 14 feet) is assigned a benefit weighting of 30 percent.
3. **Zone 3:** (Between 14 feet and 18 feet) is assigned a benefit weighting of 100 percent.
4. **Zone 4:** (Between 18 feet and 28 feet) is assigned a benefit weighting of 80 percent.
5. **Zone 5:** (Above 28 feet) is assigned a benefit weighting of 20 percent.

The District's current methodology includes a separate charge for special drainage benefit areas. Specifically, the methodology states that the costs related to the special drainage benefit areas are recovered based on each

³ A tax lot is considered residential if either the land use or the zoning designation indicates a residential lot.

⁴ Impervious area is defined as land that generates run off such as parking lots and roofs.

benefiting property's proportionate share of the total gross acreage within the benefited sub-basin.

Specifically, at the present the District has four specific sub-basin areas that are not part of the general system:⁵

1. Pump Station #2,
2. Broadmoor,
3. NE 181,
4. Fairview Lake.

Table 3-3 summarizes the current methodology.

Methodology A: Current					
	Flood	Stormwater		IGA	Subbasin
Cost Recovery Method	River Flood Control	Conv. & Mgmt. (Peak Flow)	Conv. & Mgmt. (Average Flow)		
Per Acre					X
Per Imp. Area		50%			
Elevation	50%				
Per Tax Lot					
Jurisdiction					
Indirect					

Table 3-3

Methodology B

Methodology B recovers system costs based on the District's actual costs related to providing its services. Specifically, Alternative B recovers flood control-related costs based on lot area and recovers all stormwater-related costs based on lot impervious area. Table 3-4 summarizes Methodology B.

⁵ The current methodology would exclude Fairview as a sub-basin area because no pumping is required. Pump Station #1 and #4 are part of the general system that is used in the overall management of the District and are therefore not considered.

Methodology B					
	Flood	Stormwater		IGA	Subbasin
Cost Recovery Method	River Flood Control	Conv. & Mgmt. (Peak Flow)	Conv. & Mgmt. (Average Flow)		
Per Acre	X			X	
Per Imp. Area		X	X	X	
Elevation					
Per Tax Lot					
Jurisdiction				X	
Indirect					

Table 3-4

Methodology C

Alternative C is identical to Alternative B except with regards to the recovery of stormwater-related costs. Specifically, Alternative C recognizes the fact that the District's system is designed to meet both average and peak stormwater flows. Average flows are those flows related to dealing with normal drainage regardless of any impervious area. Peak flows are flows generated by runoff due to impervious area. The District's costs related to peak flows are capital-intensive and significantly higher than those for average flows because the District's system is designed to meet peak flows rather than average flows. To recognize this difference, Alternative C recovers the costs related to average stormwater flows on a per total lot area basis while costs related to peak stormwater flows be recovered based on lot impervious area. Table 3-5 illustrates Methodology C.

Methodology C					
	Flood	Stormwater		IGA	Subbasin
Cost Recovery Method	River Flood Control	Conv. & Mgmt. (Peak Flow)	Conv. & Mgmt. (Average Flow)		
Per Acre	X		X	X	
Per Imp. Area		X		X	
Elevation					
Per Tax Lot					
Jurisdiction				X	
Indirect					

Table 3-5

Methodology D

The purpose of analyzing methodologies D and E was to assess the impact of integrating elevation benefit into an otherwise cost-of-service based approach to cost recovery. Recovering flood control costs based on elevation benefit is based on the assumption that the value of the District's flood protection services varies by elevation. Specifically, Alternative D recovers flood

control costs based on the same five elevation zones and the associated elevation benefit weights as currently used by the District.

These zones and the corresponding elevation benefit weights are:

1. **Zone 1:** (Less than 10 feet) is assigned a benefit weighting of 0 percent.
2. **Zone 2:** (Between 10 feet and 14 feet) is assigned a benefit weighting of 30 percent.
3. **Zone 3:** (Between 14 feet and 18 feet) is assigned a benefit weighting of 100 percent.
4. **Zone 4:** (Between 18 feet and 28 feet) is assigned a benefit weighting of 80 percent.
5. **Zone 5:** (Above 28 feet) is assigned a benefit weighting of 20 percent.

All stormwater-related costs are recovered from a combination of acreage and impervious area. Table 3-6 illustrates Methodology D.

Methodology D					
	Flood	Stormwater		IGA	Subbasin
Cost Recovery Method	River Flood Control	Conv. & Mgmt. (Peak Flow)	Conv. & Mgmt. (Average Flow)		
Per Acre			X	X	
Per Imp. Area		X		X	
Elevation	X (5 Zones)				
Per Tax Lot					
Jurisdiction				X	
Indirect					

Table 3-6

Methodology E

Alternative E is similar to Alternative D except that the flood control costs are recovered based on the following three elevation zones and elevation benefit weights specified by District staff:

1. **Zone 1:** (Less than 14 feet) is assigned a benefit weighting of 25 percent.
2. **Zone 2:** (Between 14 feet and 28 feet) is assigned a benefit weight of 100 percent.
3. **Zone 3:** (Above 28 feet) is assigned a benefit weight of 25 percent.

Within the District, 14 feet represents the flood level below which property cannot be developed without filling to the flood plain level. The second threshold of 28 feet, on the other hand represents the 100-year flood plain. The benefit weights specified by District staff reflect the assumption that properties located in either Zone 1 or 3 receive a lesser value from the District's services and should thus pay less. We will provide comment on this assumption as part of our discussion of Step 3. Table 3-7 provides a summary of Methodology E.

Methodology E					
	Flood	Stormwater		IGA	Subbasin
Cost Recovery Method	River Flood Control	Conv. & Mgmt. (Peak Flow)	Conv. & Mgmt. (Average Flow)		
Per Acre			X	X	
Per Imp. Area		X		X	
Elevation	X (3 Zones)				
Per Tax Lot					
Jurisdiction				X	
Indirect					

Table 3-7

Step 3: Narrow List of Alternative Methodologies

Based on updated data regarding the actual acreage, impervious area, elevation, and the location by sub-basin provided by Crawford Engineering Associates, IUG developed separate spreadsheet models to calculate each tax lot's assessments under the five alternative assessment methodologies. In addition to the customer data provided by the District's consulting engineers, the assessment models used cost allocation percentages developed by District staff. Appendix B to this report provides an overview of the cost allocations for both the District's O&M and debt service costs.

In an effort to reduce the number of alternatives from five to two (the District's current methodology and one alternative), IUG used the evaluation criteria developed in Step 1. In order to select the one alternative methodology for further analysis, IUG reviewed the remaining four methodologies for their performance based on the District's evaluation criteria.

Based on the design of the alternative methodologies and the fact that Methodologies B and C were based on a cost-of-service framework while, Methodologies D and E incorporated elements of the value-of-service framework, the key question to be evaluated was the appropriateness of the two approaches. More simply, the main difference boiled down to deciding whether elevation benefit should be included or not. IUG evaluated each

option based on the District's seven evaluation criteria. Table 3-8 presents a summary of our evaluations where "+" indicate a positive ranking, "O" indicates a neutral ranking, and "-" indicates a negative ranking.

Evaluation Criteria	Elevation Benefit	No Elevation Benefit
Equity	O	O
Rate Shock	O	O
Public Understanding	O	+
Public Acceptance	O	O
Legal Defensibility	NA	NA
Administrative Burden	-	+
Adaptability	O	O

Table 3-8

Following is a brief discussion of the rationale underlying our evaluations.

Equity: Equity can be viewed from either the cost-of-service or the value-of-service perspective. Depending on the perspective, each approach can produce equitable assessments. Both frameworks thus were perceived as neutral with regards to equity.

Rate Shock: Based on the calculated assessments and measures of rate shock, both approaches produced comparable results. This is primarily because the District's total costs related to flood control (the only cost driver using elevation benefit as a cost recovery method) comprises only approximately 10 percent of the District's total costs. In addition, based on updated elevation data developed by Crawford Engineering, Inc., the percentage of total District property that would benefit from a reduced cost burden is approximately 10 percent. Thus, keeping everything else constant, the difference between the methodologies including elevation benefit and those without was minimal.

Public Understanding: IUG views the inclusion of elevation benefit in the assessment methodology as increasing the complexity of the methodology. IUG believes that this likely decreases the public's understanding of the methodology. Although the District's current assessment methodology contains elevation benefit zones, IUG questions whether the District's landowners truly understand the methodology and whether they are able to understand how the attributes of their tax lots translate into their actual assessments. IUG thus ranked methodologies without elevation benefit higher than those including elevation benefit zones.

Public Acceptance: Public acceptance tends to be correlated with the degree of public understanding. However, given that the District's landowners accept the current assessment methodology and the fact that going to any new

methodology requires education of the public to ensure public acceptance, IUG considered both approaches neutral with regards to this criterion.

Legal Defensibility: IUG did not evaluate this criterion but rather deferred this evaluation to the District's staff and legal counsel.

Administrative Burden: In order to ensure that the District's assessments are produced in the most efficient and accurate manner possible, the methodology should be easy to maintain and updated. Including elevation benefit in the assessment methodology involves greater effort and costs related to maintaining and updating the data underlying the assessment methodology. Thus, IUG assigned a negative score to methodologies including elevation benefit and a positive score to those without.

In addition to the results of our evaluation, IUG recommends eliminating the elevation benefit from the District's assessment methodology for the following reasons:

- The ultimate benefit of flood protection for properties likely depends on land use and the improvements made by the landowners rather than the elevation of the property itself.
- The District's costs of providing flood protection (e.g., the maintenance and improvement of its levees) do not vary by elevation.
- As part of our research, IUG gathered information on local real-estate prices for properties within the District⁶. This information suggests that the filling of non-developable properties (i.e., properties located below 14 feet) is common practice in order to raise the elevation of the property.
- Based on our review of the District's costs, total flood control costs comprise 10 percent of the total system costs. Of that 10 percent, approximately 10 percent of the costs would be recovered from tax lots located at elevations with reduced benefits. Thus, the related cost impact is marginal.
- A defensible basis for appropriate elevation benefit weights is hard to establish. For instance, based on the available documentation, it is difficult to establish the basis of the existing benefit weights used as part of the District's current methodology. Based on informal knowledge gathered by the District staff and IUG, the benefit weights may be based on differences in flood insurance rates published by the Federal Emergency Management Agency (FEMA). Without further analysis that is outside of the scope of this analysis, it is questionable

⁶ Interview with Dick Shafer of Shafer Realty.

whether this approach truly captures differences in the value received by tax lots at different elevations. While the establishment of reasonable elevation thresholds seems straightforward, the development of defensible elevation benefit weights remains difficult.

In addition to eliminating Methodologies D and E for the reasons listed above, IUG also recommends eliminating Alternative B from further analysis because we believe the average-day stormwater cost driver and cost recovery method are out of line. Furthermore, from a cost-of-service approach recovering costs related to average stormwater flows is inferior to recovering those costs based on acreage.

In summary, using the process described for Step 3, IUG, in association with District staff selected Methodology C as the most appropriate methodology to be considered in addition to the Methodology A, the District's currently adopted methodology.

Step 4: Selection of Proposed Assessment Methodology

In order to identify the assessment methodology most suitable for the District, IUG conducted a detailed evaluation based on the District's evaluation criteria. Table 3-9 presents a summary of our evaluations of the two final assessment methodologies.

Evaluation Criteria	Methodology	
	Current	Proposed
Equity	-	+
Rate Shock	-	O
Public Understanding	O	+
Public Acceptance	O	O
Legal Defensibility	NA	NA
Administrative Burden	O	+
Adaptability	-	+

Table 3-9

Following is a discussion of our evaluations for each criterion:

Equity: Our evaluation of the equity criterion focused on the equity of cost allocations underlying each methodology. As such, the proposed methodology scores higher since the cost allocations are operationally based and are not based on the 50/50 split in costs between flood control and stormwater. Based on the District's actual costs of operating and managing its system, this assumption appears outdated. In addition, given the significant costs currently associated with sub-basins in the District, the required direct allocation of these costs to landowners located in the specific sub-basins produces great inequities.

Rate Shock: When compared to the District's assessments in 2003, almost all customers experienced some change in their assessments, regardless of the alternative. This result is mainly due to the following reasons:

- Switching from a set 50/50 cost allocation between flood control and stormwater management to actual cost allocations,
- Correction of customer data, specifically the amount of acreage and impervious area per lot, and
- Elimination of the minimum acreage charge.

Focusing only on comparing the degree of rate shock expected under the current and proposed alternative methodologies, the current methodology was ranked lower than the proposed methodology for rate shock. Specifically, the percentage of customers experiencing an increase greater than 10 percent in their assessments was significantly higher (45 percent) than that for proposed methodology (26 percent). In addition, the average increase in assessments experienced under the current methodology is higher than that for the proposed methodology (254 percent vs. 171 percent). It is important to note that the primary reason for these differences can be attributed to the method of recovering the sub-basin costs (i.e., directly from landowners within specific sub-basins or from all customers). Based on our findings, both methodologies will generate significant changes, both positive and negative, when compared to last year's assessments. However, the results of the rate shock analysis indicate that the current methodology generates a relatively larger negative impact than does Methodology C. Thus, IUG ranked the current methodology lower than Methodology C.

Public Understanding: Methodology C is relatively more simple in design than the current methodology which includes both sub-basin charges and elevation benefit. Thus, IUG assumes that the public will find Methodology C easier to understand. Therefore, IUG ranked Methodology C higher than the current methodology.

Public acceptance: Public acceptance tends to be correlated to the degree of public understanding. However, since the District's landowners accept the current assessment methodology and going to any new methodology would require education of the public to ensure public acceptance, IUG considered both approaches neutral with regards to this criterion.

Legal Defensibility: IUG did not evaluate this criterion but rather deferred this evaluation to the District's staff and legal counsel.

Administrative Burden: Due to its design, the current methodology will require more time and resources to maintain and update. When compared to Methodology C, the administrative burden related to the current methodology is relatively greater due to the need for maintaining and periodically updating both elevation and sub-basin data. In addition to the data requirements, the current methodology is also more complex to calculate.

For these reasons, IUG considers Methodology C to be relatively simpler and thus ranked it higher than the current methodology.

Adaptability: The design of Methodology C, specifically the use of operationally based cost allocations makes Methodology C more flexible than the District's current methodology which specifies a set cost allocation approach (i.e., 50/50 stormwater, flood protection).

Section 4:

Recommendations

Based on our analysis, IUG recommends the District:

1. Adopt Methodology C as described in Section 3:
 - Eliminate the sub-basin charges from the assessment methodology.
 - Eliminate elevation benefit from the assessment methodology and instead base the recovery of flood control costs on acreage.
 - Recover peak-stormwater costs based on lot impervious area.
 - Recover average-stormwater costs based on lot total area.
2. Review cost allocations annually and recommend changes when necessary.
3. Have the District Board of Supervisors approve all cost allocations on an annual basis.
4. Have the District Board of Supervisors approve cost allocations and cost recovery methods for IGA-related costs on a case-by-case basis.

Other Assessment Issues

Although the majority of the District's properties will be covered under the basic guidelines of a recommended methodology, some property owners have unique needs or characteristics that will require the District to make individualized decisions as to their treatment in the assessment process. Following is a list of such issues the District may face as well as IUG's recommendation for dealing with them. IUG is aware of the fact that the list of issues presented below may not be exhaustive⁸; however, IUG believes that our recommendations presented below will be a helpful starting point for the District.

⁸ IUG and District staff also considered issues such as low-income customers. However, at this time no specific action was deemed necessary.

Lands Assessed

The District currently assesses all properties within the District boundaries that are carried on the Multnomah County Property Tax rolls. IUG recommends that this scope be expanded to include all lands in the District as allowed in ORS Chapter 547, including publicly owned properties except when the provision of drainage services to such properties is specifically addressed by intergovernmental agreement. IUG further recommends that the properties owned by the District not be included in the assessment calculations.

Billing System

The District's current policy is to assess properties, regardless of ownership. IUG views this practice to be in line with a cost-of-service framework since it recognizes that ownership of a property does not influence the cost of providing drainage services. When practical, the District's assessments are included on the property tax statements issued by Multnomah County Tax Assessor's office. For properties not billed through Multnomah County's property tax system, or whenever not practical or necessary, IUG recommends that the District bill property owners directly.

Assessment of Water Bodies

IUG recommends that all bodies of water used as part of the operation of the public drainage system (e.g., natural storage areas) be not assessed any charges based on impervious area but instead only pay those charges recovered based on acreage. All other water bodies should be treated as all other lands in the District for assessment purposes.

Appeal Process of Tax-lot Characteristics

The District's proposed assessment methodology uses lot size and impervious area as the means to recover costs from its land owners. The assessments calculated as part of this study are based on updated data provided by Crawford Engineering Associates⁹. However, given the importance of the accuracy of tax lot characteristics in the assessment process, IUG recommends the District design an appropriate appeals process through which customers can appeal the specific characteristics underlying their assessment. We further recommend that the District Board of Supervisors adopt the appeals process and revise it if necessary.

⁹ Crawford Engineering Associates used the following sources: 2002 aerial photographs, RLIS GIS maps and data., Multnomah County Tax Records, and District files.

Glossary

This section presents a glossary of commonly used terms

Impervious Area: Land that generates run off such as parking lots and roofs.

Indirect Cost: A cost item that cannot directly be allocated to one of the District's cost drivers. Using standard rate making principles, these costs are spread over all customers based on the allocation of all direct costs.

Stormwater–Conveyance & Management (Average): Capacity of the District's facilities (pump capacity, channel capacity and storage) designed to meet a 24-hour 2-year storm even.

Stormwater–Conveyance & Management (Peak): In order to meet peak flow demands, the District protects properties from the flooding potential of anything greater than the 24-hour 2-year storm event and up to a 100-year storm to meet FEMA and USACOE flood protection standards.

NGVD: The National Geodetic Vertical Datum (mean sea level) is used in this text. To correct to the City of Portland datum: +1.34' to NGVD elevation.

River Flood Control: Protection of properties within the District from external flooding from the Columbia River and Lower Columbia Slough up to a 500-year event.

USACOE: U.S. Army Corps of Engineers.

Appendix A:

Implementation Issues

Implementation of a new assessment methodology will require the District to establish a set of implementation guidelines as well as develop guidelines for the annual update of its assessments. To assist the District in this effort, IUG developed the following set of implementation guidelines. These guidelines may not be exhaustive but will provide the District with sufficient guidelines on various issues related to implementing and maintaining the new assessment methodology.

Assessment Process

The How-To of Annual Updates


As part of this study, IUG will provide the District with a ready-to-use spreadsheet model that calculates assessments of customers based on the new assessment methodology. The spreadsheet is designed to make the update process as streamlined as possible. In general, the updates necessary on an annual basis involve the following:

- Update the District's costs (O&M and debt-related) based on the budget adopted by the District Board.
- Update any changes in customer data
 - Update impervious area estimates every 2 to 3 years.
 - Update acreage information annually.
- Add new tax lot information to the spreadsheet.
- Review cost allocations and make adjustments as necessary.

The specific details on updating the model as part of the annual assessment process will be documented in the user's manual produced by IUG to accompany the assessment model.

Timing of Annual Updates

Based on our understanding of the timelines and issues related to the annual assessment updates, IUG recommends the following:

- IUG recommends that the District select a cut-off date for any data changes after which changes to customer data will be reflected in the assessments of the following year.
- Using these data along with the District's adopted budget, IUG recommends that the District update the assessment spreadsheet only once per year. It is our understanding that the District needs to submit its assessment to the Multnomah County Tax Assessor's office no later than July 15 of each year. To provide the District with ample time to update the model and have sufficient time to attend to any related issues,  recommends starting the annual update process no later than April 15th of each year.

Data Archiving

Keeping good records of the District's historical assessments will be an essential part of managing the new assessment methodology successfully. To that end, IUG recommends that the District archive each year's model, in at least two separate formats (e.g. CD-ROM, hard drive) and locations and under unique file names.

Appendix B:

Determination of Cost Allocation Percentages

Appendix C to this report illustrates the steps involved in calculating the District's assessments. One of those steps, Step 3, involves allocating costs to cost drivers (e.g., flood control, stormwater—peak, stormwater—average, etc.). The purpose of this appendix is to provide a brief overview of the approach used to determine the cost allocation percentages in this study.

While the assessment model underlying this study uses the District's working budget and thus a large number of detailed line items, the actual cost allocations tend to be similar for line items serving similar functions. For instance, the model may list *Office/Shop Phone*, *Internet*, and *Office Cell Phones* separately but allocate all three of these general and administrative costs (G&A) indirectly. For the purpose of conceptualizing the allocation process, the District's FY2004 budget could be grouped as follows:

- General & Admin
- Personnel
- Pump Station
- Maintenance
- Conveyance
- Levee
- IGA.

This list is specific to the District's 2004 budget and may include other groupings in the future. Following is a brief discussion of each type of cost and how such cost can be allocated.

General & Admin

G&A costs typically capture all those costs that are necessary to administer the operations of the District. Examples of typical G&A costs are

Advertising & Promotion, Community Education, and Membership Dues & Subscriptions. Given their general nature and the fact that they typically cannot be allocated directly to any of the other functions of the District (e.g., pumping, maintenance, etc.), these costs are generally allocated indirectly to the District's cost drivers. Indirect costs are recovered from other cost drivers in proportion to the allocation of the other cost drivers. For example, if 20 percent of the non-indirect costs are recovered based on acreage and the 80 percent are recovered based on impervious area, then the indirect costs would be recovered proportionally based on the 80/20 split of costs.

For example, based on the District's FY2004 budget, the estimated direct allocations of all other line items indicated that 11.73 percent, 17.79 percent, and 70.48 percent were allocated to *Flood Control*, *Stormwater—Peak*, and *Stormwater—Average*, respectively. The G&A line items would thus be allocated based on the same percentages. However, while many G&A line items are allocated indirectly, some of the line items could also be directly allocated to one of the District's cost functions if appropriate.

Personnel Costs

Personnel costs include salaries, retirement, taxes, and insurance. Personnel costs are commonly allocated in proportion to the actual amount of time spent by employees on the District's cost drivers.

As an example, based on a review of how the District's employees spend their time, District staff estimated cost allocations for the FY2004 budget. Based on this review, District staff estimated that approximately 10 percent of total staff time is spent on tasks related to *Flood Control*, 10 percent on *Stormwater—Peak* tasks, 50 percent on *Stormwater—Average* tasks, and the remaining 30 percent on overhead tasks. The costs associated with the overhead tasks are allocated indirectly to the other cost drivers.

Pump Station Costs

Pump station costs can include a variety of costs including those related to electricity or specific equipment used in the pump stations. The allocation of pump station costs should thus reflect the actual usage of the pump stations. For example, for the FY2004 budget the estimated allocation percentages assume that 40 percent of the pump station electricity costs are related to *Stormwater—Peak* while 60 percent are related to *Stormwater—Average*.

Maintenance Costs

The District performs many maintenance tasks and thus the proper allocation of these costs requires matching each type of maintenance costs with the most appropriate cost driver. For instance, the FY2004 budget line item *Fairview*

Lake maintenance costs are estimated to be split 30/70 between *Stormwater—Peak* and *Stormwater—Average*. Other maintenance costs (e.g., *Equipment Repair Expense*) are general in nature and thus allocated indirectly.

Conveyance Costs

Conveyance costs capture the District's costs in conveying stormwater flows within its service boundaries. As such, the cost allocations should be limited to the two-stormwater cost drivers. In allocating conveyance costs, considering the type and amount of flows generating the specific conveyance cost items maybe helpful. For instance, and estimated 30 percent of the District's FY2004 budget for *Ditch Maintenance* costs are allocated to *Stormwater—Peak* with the remaining 70 percent being allocated to *Stormwater—Average*. This allocation recognizes the fact maintaining ditches is primarily an ongoing expense.

Levee Costs

Levee costs are all costs specifically related to the maintenance of the District's levees. In general, these costs can all be allocated to *Flood Control*.

IGA Costs

The District currently has multiple IGAs with different entities. IGAs by their nature can vary significantly in their underlying rationales, cost drivers, revenue drivers, and negotiated terms. For example, the District currently has an IGA with the City of Portland that accounts for the services provided by both entities. Some of the services covered in the District's IGA with the City of Portland include environmental management, stormwater maintenance, and transportation system-related stormwater management. For cost allocation purposes, the District estimated that of the IGA costs budgeted for FY2004, approximately 40 percent were related to environmental management and 60 percent were related to stormwater. However, given the individual nature of IGAs, the costs allocations for IGA-related costs will have to be determined on a case-by-case basis. IUG recommends that the District staff review the costs allocations underlying the District's assessment on an annual basis and make recommendations for adjustments if necessary. IUG further recommends that the District's Board of Supervisors approve the cost allocations on an annual basis. Using the process outlined above, the District's FY2004 budget was allocated to the District's cost drivers as shown in Figure 3-3.

Appendix C: Overview of Assessment Process

As part of this study, IUG developed an electronic representation of the proposed methodology in the form of a detailed spreadsheet model. Using all customers' tax lot information, the District's annual costs, as well as allocation percentages provided by the District (see Appendix B), the assessment model calculates each customer's budget and bond assessments. In order to provide the District with the needed flexibility, the actual model contains over 100 tables with many tables being unused. Following is a discussion of the basic process followed in calculating the District's assessments. The numbers used in this discussion are for illustrative purposes only and do not represent actual data used in the assessment model.

The process is presented in 15 steps. Each step is explained in more detail below.

Step 1: Determine Revenue Requirement

In order to provide the District landowners with the needed services, the District incurs costs. These costs must be recovered from the District's landowners in a fair and equitable manner. For instance, the District incurs ongoing O&M and debt service costs related to outstanding bonds. The District recovers the O&M and bond-related costs in two separate assessments that are included in the annual Multnomah County property tax statements.

O&M Costs

The first step of the assessment process is to identify the District's costs (O&M budget and bond-related) in sufficient detail. Table AC-1 shows an example of the District's O&M budget. In this example, the total annual O&M budget equals \$175,000. Reducing the O&M costs by \$15,000 in offsetting revenues (e.g., contract revenues), results in the net O&M costs (\$160,000) that need to be recovered from the District's landowners via its Budget Assessment.

Cost Item	Cost
Item 1	\$25,000
Item 2	10,000
Item 3	50,000
Item 4	90,000

Total O&M Costs	\$175,000
Offsetting Revenues	
Item 1	(\$5,000)
Item 2	(10,000)

Net O&M Cost	\$160,000

Table AC-1: O&M Budget Example

Bond Costs

The estimation of the District's bond-related costs is based on the District's annual debt service prorated based on the actual reason of issuance of the bond. Table AC-2 illustrates the calculation of the proration percentages that are used to prorate the District's total annual debt service to its various components.

Bond Issue	Issue Size	Percent of Total
Issue 1	\$10,000	10.53%
Issue 2	25,000	26.32%
Issue 3	50,000	52.63%
Issue 4	10,000	10.53%
	-----	-----
Total	\$95,000	100.00%

Table AC-2: Calculation of Debt Proration Percentages

Table AC-3 then takes the calculated percentages to spread the District's total annual debt service related to those bonds (\$100,000) to its components. Reducing the total annual debt service costs by any capital-related offsetting revenues (e.g., interest) yields the net bond costs that the District needs to recover from landowners via its Bond Assessment (\$75,000).

Bond Issue	Cost
Issue 1	\$10,526
Issue 2	26,316
Issue 3	52,632
Issue 4	10,526

Annual Debt Service	\$100,000
Offsetting Revenues	
Item 1	(\$25,000)
Item 2	0

Net Bond Costs	\$75,000

Table AC-3: Calculation of Net Bond Costs

The sum of the O&M and bond costs represents the District's annual revenue requirement. However, for the purpose of assessment the model calculates separate O&M and bond assessments for each customer. In both cases, the steps followed to calculate the actual assessments are identical. To avoid duplication, the remaining steps are illustrated for the District's O&M costs.

Step 2: Allocate Costs to Groups

Step 2 assigns the O&M costs to cost groups. A cost group is a group of one or more types of customers that share responsibility for a cost incurred by the District. For example, the joint cost group includes all District customers. Joint costs are those costs that are shared by all customers of the District in proportion to their respective use of the system. Other costs are specific to certain groups of customer classes. For example, costs associated with District's IGA with the City of Portland are costs specific to only those landowners located within Portland's city limits. Based on the District's current cost structure, IUG only used one specific cost group, City of Portland which is designed to capture the costs related to the District's IGA with the City. However, the model is designed to accommodate additional specific cost groups if the need should arise in the future.

Task 2.1 Assigning Costs to Cost Groups

The first task is to allocate each budget line item to either the joint or the City of Portland cost group. Table AC-4 illustrates this task. (For a more detailed discussion of the allocation percentages underlying this study, please refer to Appendix B to this report).

Cost Item	Joint	City of Portland	Total
Item 1	100%	0%	100%
Item 2	100%	0%	100%
Item 3	100%	0%	100%
Item 4	0%	100%	100%
Offsetting Revenues			
Item 1	100%	0%	100%
Item 2	100%	0%	100%

Table AC-4: Allocation of O&M Cost to Cost Group

Next, these allocation percentages are multiplied by the O&M budget line items and offsetting revenue items shown in Table AC-1 to allocate the net O&M costs to cost groups. Table AC-5 shows these allocations.

Cost Item	Joint	City of Portland	Total
Item 1	\$25,000	\$0	\$25,000
Item 2	10,000	0	10,000
Item 3	50,000	0	50,000
Item 4	0	90,000	90,000
	-----	-----	-----
O&M Costs	\$85,000	\$90,000	\$175,000
Offsetting Revenues			
Item 1	(\$5,000)	\$0	(\$5,000)
Item 2	(\$10,000)	\$0	(10,000)
	-----	-----	-----
Net O&M Cost	\$70,000	\$90,000	\$160,000

Table AC-5: Allocation of Net O&M Costs to Cost Groups

Step 3: Allocate Costs by Group to Cost Drivers

Step 3 allocates the total costs for each group to the District's cost drivers. Table AC-6 illustrates this step for the joint O&M costs. Please see Appendix B for a discussion of the actual cost allocations used in this study. In some cases, a particular cost is difficult to assign directly to one of the 5 cost drivers. In that case, IUG recommends allocating the line item indirectly, i.e., in proportion to the total direct allocations. This case is reflected for both of the offsetting revenue line items. For instance, based on the total costs allocated to the budgeted O&M items in Table AC-7, 59 percent of total costs were allocated to flood control, while the remaining 24 percent and 18 percent were allocated to the stormwater peak and average cost drivers, respectively.

Thus, the offsetting revenue line items would be allocated in the same proportions.

Cost Item	Flood Control	Stormwater -Peak	Stormwater -Average	COP-- Stormwater	COP-- Environ.	Total
Item 1	100%					100%
Item 2		75%	25%			100%
Item 3	50%	25%	25%			100%
Item 4				60%	40%	100%
Offsetting Revenues						
Item 1	59%	24%	18%	0%	0%	100%
Item 2	59%	24%	18%	0%	0%	100%

Table AC-6: Allocation Percentages of Joint O&M costs

Using these allocation percentages, Table AC-7 allocates each O&M line item to the District's cost drivers. At the bottom of Table AC-7, the indirect cost allocation percentages are calculated.

Cost Item	Flood Control	Stormwater -Peak	Stormwater -Average	COP-- Stormwater	COP-- Environ.	Total
Item 1	\$25,000	\$0	\$0	\$0	\$0	\$25,000
Item 2	0	7,500	2,500	0	0	10,000
Item 3	25,000	12,500	12,500	0	0	50,000
Item 4	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Total	\$50,000	\$20,000	\$15,000	\$0	\$0	\$85,000
Offsetting Revenues						
Item 1	(2,941)	(1,176)	(882)	0	0	(\$5,000)
Item 2	(5,882)	(2,353)	(1,765)	0	0	(10,000)
	-----	-----	-----	-----	-----	-----
Net O&M Cost	\$41,176	\$16,471	\$12,353	\$0	\$0	\$70,000
Indirect Allocation	59%	24%	18%	0%	0%	100%

Table AC-7: Allocation of Joint O&M Costs to Cost Driver

Tables AC-8 and AC-9 present similar tables for the costs specifically allocated to the City of Portland residents.

Cost Item	Flood Control	Stormwater -Peak	Stormwater -Average	COP-- Stormwater	COP-- Environ.	Total
Item 1				60%	40%	100%
Item 2				60%	40%	100%
Item 3				60%	40%	100%
Item 4				60%	40%	100%
Offsetting Revenues						
Item 1	0%	0%	0%	60%	40%	100%
Item 2	0%	0%	0%	60%	40%	100%

Table AC-8: Allocation Percentages of City of Portland O&M costs

Cost Item	Flood Control	Stormwater -Peak	Stormwater -Average	COP-- Stormwater	COP-- Environ.	Total
Item 1	\$0	\$0	\$0	\$0	\$0	\$0
Item 2	0	0	0	0	0	0
Item 3	0	0	0	0	0	0
Item 4	0	0	0	54,000	36,000	90,000
	-----	-----	-----	-----	-----	-----
Total	\$0	\$0	\$0	\$54,000	\$36,000	\$90,000
Offsetting Revenues						
Item 1	0	0	0	0	0	0
Item 2	0	0	0	0	0	0
	-----	-----	-----	-----	-----	-----
Net O&M Cost	\$0	\$0	\$0	\$54,000	\$36,000	\$90,000
Indirect Allocation	0%	0%	0%	60%	40%	100%

Table AC-9: Allocation of City of Portland O&M Costs to Cost Driver

Table AC-10 presents a summary of net O&M costs by cost group to cost driver.

Cost Item	Flood Control	Stormwater -Peak	Stormwater -Average	COP-- Stormwater	COP-- Environ.	Total
Joint	\$50,000	\$20,000	\$15,000	\$0	\$0	\$85,000
City of Portland	0	0	0	54,000	36,000	90,000
	-----	-----	-----	-----	-----	-----
Total	\$50,000	\$20,000	\$15,000	\$54,000	\$36,000	\$175,000

Table AC-10: Summary of O&M Allocations to Cost Driver

Step 4: Specify Cost Recovery Methods

After the costs have been allocated to cost driver, the cost recovery method for each cost driver and the total actual units associated with each need to be established. The cost recovery methods for each cost driver are specified by the methodology (except for any new IGA costs for which the District Board of Supervisors selects the appropriate cost recovery methods). Table AC-11 provides a summary of the cost recovery methods and the corresponding units that are used in the proposed methodology.

Item	Flood Control	Stormwater-- Peak	Stormwater-- Average	COP-- Stormwater	COP-- Environ.
Cost Recovery Method	Lot Size	Imp. Area	Lot Size	Imp. Area	Lot Size
Units	Square Feet	Square Feet	Square Feet	Square Feet	Square Feet

Table AC-11: Summary of Cost Recovery Methods & Units

The next step involves estimating the total number of units to be used for each cost driver and group. Table AC-12 shows the sample units used in this example. It is important to note, that the number of units need to be estimates for each cost group.

Cost Group	Flood Control	Stormwater-- Peak	Stormwater-- Average	COP-- Stormwater	COP-- Environ.
Joint	10,000,000	7,500,000	10,000,000	7,500,000	10,000,000
City of Portland				4,500,000	6,000,000

Table AC-12: Unit Summary

Step 5: Calculation of Unit Rates

Step 5 divides the total O&M costs by cost driver and group (Table AC-10) by the units shown in Table AC-12 to calculate appropriate unit costs per square foot. For example, the \$0.005/square foot rate for joint flood protection costs was calculated by dividing \$50,000 by the 10,000,000 square feet shown in Table AC-12 for this joint flood protection costs. Table AC-13 provides the sample unit rates.

Cost Group	Flood Control	Stormwater-- Peak	Stormwater-- Average	COP-- Stormwater	COP-- Environ.
Joint	\$0.0050	\$0.0027	\$0.0015	\$0.0000	\$0.0000
City of Portland	\$0.0000	\$0.0000	\$0.0000	\$0.0120	\$0.0060

Table AC-13: O&M Unit Rates

Step 6: Calculation of Assessment

The final step in the assessment process is to calculate each customer's assessments. To illustrate this part of the process, we selected 3 hypothetical customers whose primary characteristics are shown in Table AC-14.

Customer	In Square Feet		City of Portland Resident
	Tax Lot Size	IA	
A	21,780	10,890	Yes
B	43,560	43,560	No
C	10,000	5,300	No

Table AC-14: Tax Lot Characteristics of Sample Customers

Conceptually, a landowner's assessment is the sum of the tax lot's proportionate share of joint costs and any specific costs, if applicable. For example, a tax lot within located within the city limits of Portland would pay a proportionate share of all costs allocated to the City of Portland cost group in addition to the joint costs. Sample Customer A is an example for a City of Portland resident.

Using the unit rates by cost driver shown in Table AC-13 and multiplying them by the appropriate cost recovery method (e.g., square feet of lot size or impervious area) generates each customer's assessment by cost driver. To illustrate how joint and specific costs are recovered, Tables AC-15 through AC-17 present a summary of the assessment calculations for each cost group.

As the Tables clearly show, all customers share in the District's joint costs. However, only Sample Customer A pays for the costs specifically allocated to the City of Portland residents.

Customer	Flood Control	Stormw.-- Peak	Stormw.-- Average	COP-- Stormw.	COP-- Environ.	Total
A	\$108.90	\$29.04	\$32.67	\$0.00	\$0.00	\$170.61
B	217.80	116.16	65.34	0.00	0.00	399.30
C	50.00	14.13	15.00	0.00	0.00	79.13

Table AC-15: Calculation of Joint Cost Assessments

Customer	Flood Control	Stormw.-- Peak	Stormw.-- Average	COP-- Stormw.	COP-- Environ.	Total
A	\$0.00	\$0.00	\$0.00	\$130.68	\$130.68	\$261.36
B	0.00	0.00	0.00	0.00	0.00	0.00
C	0.00	0.00	0.00	0.00	0.00	0.00

Table AC-16: Calculation of City of Portland Specific Assessments

Adding the assessments from the previous two tables generates the total annual assessments for the three customers. Table AC-17 summarizes the total assessments for each customer.

Customer	Flood Control	Stormw.-- Peak	Stormw.-- Average	COP-- Stormw.	COP-- Environ.	Total
A	\$108.90	\$29.04	\$32.67	\$130.68	\$130.68	\$431.97
B	217.80	116.16	65.34	0.00	0.00	399.30
C	50.00	14.13	15.00	0.00	0.00	79.13

Table AC-17: Total Annual Assessments

¹⁰ The median denotes the value that is the middle value or the 50th percentile of a distribution of data.

¹¹ The standard deviation is a measure of dispersion of a sampling distribution and is equal to the square root of the sample variance.

Appendix D: Sample Assessment Calculation

Following are four examples illustrating the calculation of the annual assessments. Specifically we present the assessment calculations of four customers: 2 residential and 2 non-residential customers with one of each located either within or outside of the city limits of Portland.

Conceptually each customer's annual assessment is the sum of each unit cost associated with a given cost driver times the particular number of cost recovery units for a particular customer. In mathematical form:

$$\text{Assessment}_{\text{Cost Driver A}} = \text{Unit Cost}_{\text{Cost Driver A}} * \text{Square Feet}_{\text{Cost Recovery Method}}$$

Table AD-1 summarizes the cost drivers, cost recovery methods, and unit costs per square foot for the FY2004 budget and bond assessments. The unit costs are calculated in the District's assessment model.

Cost Driver	Recovery Method (square)	Unit Costs (per square foot)	
		O&M	Bond
Flood Control	Lot Size	\$0.0004	\$0.0003
Stormwater--Peak	Lot Size	0.0014	0.0049
Stormwater--Average	IA	0.0023	0.0000
COP IGA-Environ.	Lot Size	0.0006	0.0000
COP IGA--Stormwater	IA	0.0021	0.0000

Table AD-1: Summary of Unit Costs

For a discussion on the costs allocated to each cost driver, please refer to Section 3 and/or Appendix B.

Residential Customer—Non-City of Portland Resident

The first example represents a residential customer with a 10,000 square foot lot who is not located within the city limits of Portland. Based on the assumption that the amount of impervious area of residential lots is equal to 45% of lot size, the amount of impervious area assumed for this customer is 4,500 square feet. This estimate is below the specified cap of 5,300 square feet of impervious area specified by the methodology and thus remains unadjusted.

Table AD-2 presents the calculation of the individual assessment components. For instance, the \$3.79 O&M assessment related to flood control was calculated by multiplying the customer's lot size of 10,000 square feet times the corresponding unit cost of \$0.0004 (Table AD-1). Similarly, the \$22.78 bond assessment related to peak stormwater was calculated by multiplying 4,500 square feet of impervious area times the corresponding unit of \$0.0049 per square foot.

As the table shows, residential not living with the City of Portland's jurisdiction do not pay for the cost related to the District's IGA with the City of Portland.

Cost Driver	Lot Characteristics (square feet)	Annual Assesment		
		O&M	Bond	Total
Flood Control	10,000	\$3.79	\$2.82	\$6.61
Stormwater--Peak	4,500	6.40	22.18	28.58
Stormwater--Average	10,000	22.78	0.00	22.78
COP IGA-Environ.	10,000	NA	NA	NA
COP IGA--Stormwater	4,500	NA	NA	NA
Total		\$32.97	\$25.00	\$57.97

Table AD-2: Residential Customer (Non-City of Portland Resident)

Residential Customer—City of Portland Resident

Table AD-3 provides a summary for an identical residential lot located within the city limits of Portland. The table clearly illustrates, that the customers within the city limits pay their share of the District's IGA with the City of Portland¹².

Cost Driver	Lot Characteristics (square feet)	Annual Assesment		
		O&M	Bond	Total
Flood Control	10,890	\$4.13	\$3.07	\$7.20
Stormwater--Peak	4,500	6.40	22.18	28.58
Stormwater--Average	10,890	24.81	0.00	24.81
COP IGA-Environ.	10,890	6.60	0.00	6.60
COP IGA--Stormwater	4,500	9.44	0.00	9.44
Total		\$51.38	\$25.25	\$76.63

Table AD-3: Residential Customer (City of Portland Resident)

¹² For a more detailed discussion of IGA-related costs, please refer to Section 3 of this report.

Non-Residential Customer—Non-City of Portland Resident

Unlike residential customers whose impervious area is estimated, the amount of impervious area for all non-residential customers are part of each customer's record and are unique for each lot. Except for this difference, the process of calculating the annual assessments is identical as those presented for the two residential customers. Table AD-4 presents the calculation of the annual assessment for a sample non-residential customer not located with the city limits of Portland. This sample customer has a lot size of 1 acre and half an acre of impervious area.

Cost Driver	Lot Characteristics (square feet)	Annual Assessment		
		O&M	Bond	Total
Flood Control	43,560	\$16.51	\$0.00	\$16.52
Stormwater--Peak	21,780	30.98	0.15	31.13
Stormwater--Average	43,560	99.23	0.00	99.23
COP IGA-Environ.	43,560	NA	NA	NA
COP IGA--Stormwater	21,780	NA	NA	NA
Total		\$146.72	\$0.16	\$146.88

Table AD-4: Non-Residential Customer (Non-City of Portland Resident)

Non-Residential Customer—City of Portland Resident

This sample non-residential customer is located within the city limits of Portland and thus is responsible for paying a portion of the costs of the District's IGA with the City of Portland. The customer's lot size is assumed to be one acre with 50 percent being impervious area. Table AD-5 summarizes the assessment calculations.

Cost Driver	Lot Characteristics (square feet)	Annual Assessment		
		O&M	Bond	Total
Flood Control	43,560	\$16.51	\$0.00	\$16.52
Stormwater--Peak	21,780	30.98	0.15	31.13
Stormwater--Average	43,560	99.23	0.00	99.23
COP IGA-Environ.	43,560	26.41	0.00	26.41
COP IGA--Stormwater	21,780	45.69	0.00	45.69
Total		\$218.83	\$0.16	\$218.98

Table AD-5: Non-Residential Customer (City of Portland Resident)

Appendix E: Electronic Copy of Assessment Model

The electronic assessment model included in this appendix is a working file only and does not represent the final assessment model used by the County to generate actual assessments. The model is merely included to give an example of the type of models used in this analysis. The final assessment model will be developed following the adoption of a new methodology by the Multnomah County Board of Commissioners and after all customer data have been collected and verified.