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## MEMORANDUM

**DATE:** September 23, 2003

**TO:** Metropolitan King County Councilmembers

**FROM:** Cheryle A. Broom, County Auditor

**SUBJECT:** Performance Audit Wastewater Treatment Division (WTD) Capital Planning Program

The council requested this study as part of the auditor's 2003 Annual Work Program. The study reviewed the county's planning, programming, and management of wastewater treatment capital improvement projects.

The audit focused on (1) identifying how wastewater capital projects are developed, programmed, monitored, managed, and quality controlled; and (2) how the Wastewater Treatment Division's data collection, analysis, and reporting practices could be better utilized to strengthen accountability to decision makers and ratepayers.

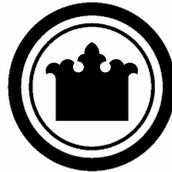
We addressed these areas by reviewing the division's management of ongoing wastewater capital projects and comparing those activities with industry best management practices. We also reviewed the division's current data collection practices with the intent of identifying the key information needed to support best management practices and provide accountability to the council and stakeholders.

The report found that some division practices fall short of national industry standards for best management practices, which could reduce the cost effectiveness of the capital program. The report also found that the data/information needed to follow best practices are partially available but are not maintained or reported in ways that fully support the capital planning process. The WTD is equipped to bring its capital planning process in line with best practices and is already moving in that direction in many areas. The audit makes several recommendations to strengthen analysis of proposed and completed capital projects, as well as to provide information that can be used by decision makers to assess the performance of individual projects and WTD capital program-wide performance.

In his response to this study, the executive indicated that he generally concurs with the report's 11 recommendations, and seeks to continue working with our office and the council to address the audit's recommendations concerning data reporting and accountability. We appreciate the cooperation received from management and staff at the Wastewater Treatment Division, the Office of Management and Budget, and the Finance and Business Operations Division.

# **PERFORMANCE AUDIT**

## **WASTEWATER TREATMENT DIVISION CAPITAL PLANNING**



**King County**

Presented to  
the Metropolitan King County Council  
Labor, Operations & Technology Committee  
by the  
County Auditor's Office

Cheryle A. Broom, King County Auditor  
Valerie Whitener, Principal Management Auditor  
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Report No. 2003-03  
September 23, 2003

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## Abbreviations

CIP	Capital Improvement Program
GAO	General Accounting Office
LCCA	Life-cycle Cost Analysis
OMB	Office of Management and Budget
RWSP	Regional Wastewater Services Plan
WTD	Wastewater Treatment Division

# EXECUTIVE SUMMARY

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## Introduction

This mandated performance audit of the capital planning program of the King County Wastewater Treatment Division (WTD) reviewed how the WTD carries out capital planning activities. It also focused on stakeholders' expressed interest in obtaining more information about wastewater projects and WTD performance in delivering those projects. The audit assessed the extent to which the capital program is managed consistent with industry best practices and how data collection, analysis, and reporting activities can support decision makers and provide accountability to ratepayers.

## General Conclusions and Findings

Overall, we found that the WTD is making progress in improving management of its capital planning activities. Nevertheless, there are some industry best practices that would lead to greater accountability and better information for decision makers if implemented by the division.

Some WTD practices appear to align with industry standards for best management practices. We found that:

- WTD practices for assessing environmental, public health, population, and development conditions were found to be consistent with industry best management practices. These are crucial elements in a capital planning process for wastewater projects.

In contrast, other WTD practices fall short of industry standards for best management practices, which could reduce the cost effectiveness of the capital program. We found that:

- Information about the condition, repair, and replacement costs of existing assets is not analyzed at the WTD

system level and is not integrated into financial analysis of capital project alternatives.

- Guidelines for conducting financial/life-cycle cost analysis are lacking, analytical approaches to analyzing project cost are inconsistent and in some instances flawed, and WTD (and county government as a whole) does not have in place a policy for determining the time value of money in economic analyses.
- Post-project evaluations and lessons learned are not routinely conducted to support ongoing improvement to capital project management.
- Although the data/information needed to follow best practices are partially available, they are not maintained or reported in ways that best support the capital planning process.

The WTD is equipped to bring its capital planning process in line with best practices, and is already moving in that direction in some areas. Overall, a variety of activities that appear to offer promise toward improving performance and increasing accountability are underway. These include:

- Development of a new capital project management system, including guidelines for conducting life-cycle cost analysis and standardized data reporting;
- Transition to a centralized system of asset management and improvements to systemwide inventory;
- A new capital project ranking/prioritization system with refinements proposed for 2004; and
- Contributing to the Office of Management and Budget's development of a countywide discount rate policy.

### **Scope and Objectives**

The audit focused on the means by which wastewater capital projects are developed, programmed, tracked, managed, and quality controlled. We used case studies of WTD capital and asset improvement projects to identify current management practices, then compared these practices with industry standards. We also examined opportunities for tracking key project information and communicating this information to decision makers. This was conducted with the intent of developing a framework for reporting information to decision makers.

### **Summary of Findings and Recommendations**

The report makes 11 recommendations to strengthen capital project management oversight and accountability:

- Establish guidelines for conducting financial analyses of capital project alternatives, including development of a countywide policy for calculating the time value of money.
- Analyze existing asset cost and condition information and integrate into financial analyses of capital planning alternatives.
- Establish a reporting system consistent with the data framework in this report, for reporting project cost, options/alternatives, and rate impact information to decision makers.
- Revise current code-mandated reporting requirements to: better meet the information needs of decision makers, support implementation of best management practices, and promote accountability to ratepayers.

### **Summary of Executive Response**

The executive generally concurs with all of the recommendations in the report, but is concerned about its ability to cost-effectively

capture and analyze information to implement the audit's three recommendations concerning data reporting and accountability. The executive wishes to continue to work with the auditor's office and the council to implement the recommendations. See the appendices section for the complete text of the Executive Response.

**Auditor's Comments to Executive Response**

We concur that the division should continue to work with the council to determine how best to provide information about capital program performance. This will help to facilitate improved accountability to the council and stakeholders.

The intent of the report's recommendations is to improve both capital program operations and access to information about the program's performance. The project management system under development at the WTD will be central to capital program management and that information will be useful not only to support best management practice s but also to provide meaningful program performance information.

**Acknowledgement**

The King County Auditor's Office wishes to thank the management and staff of the Wastewater Treatment Division for their assistance and cooperation. The auditor staff are also grateful to staff of the Office of Management and Budget and the Finance and Business Operations Division for their assistance and technical review of this report.

# 1 INTRODUCTION

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## **Interest in Wastewater Capital Program Delivery**

### **Audit Background**

In adopting the County Auditor's 2003 Work Program, the Metropolitan King County Council directed the auditor to conduct a review of the county's planning, programming, and management of wastewater treatment capital improvement projects. Support for this audit previously had been established via budget proviso in both the 2002 and 2003 adopted budgets. The council, which approves the annual sewer rate and capacity charge, wastewater treatment capital and operating budgets, and annual CIP funding reallocations, had expressed interest in obtaining more information about wastewater capital projects and the Wastewater Treatments Division's (WTD) performance in delivering these projects.

## **WTD Activities Compared to Industry Best Practices**

The audit scope and objectives focused on identifying how wastewater capital projects are developed, programmed, tracked, managed, and quality controlled. WTD capital program management practices were reviewed using case studies, and those findings were compared with industry best management practices. The division's data collection, analysis, and reporting practices also were reviewed, with the intent of providing a framework for reporting information to decision makers.

### **Wastewater Treatment in King County**

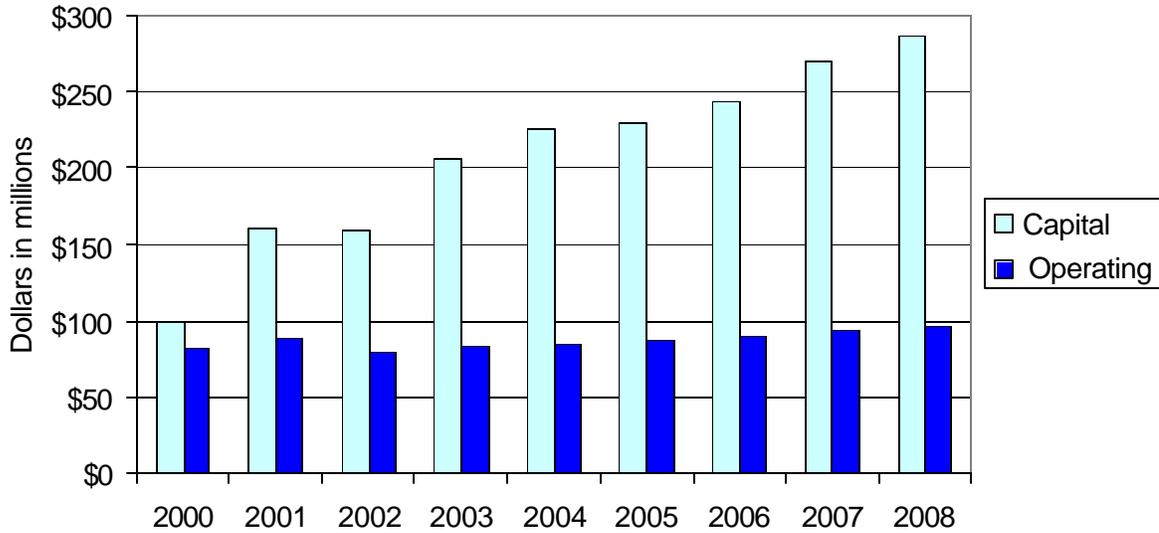
King County provides wastewater conveyance and treatment services to 18 cities and 15 sewer districts in the central Puget Sound region. The county does not provide wastewater services directly to residential or business customers. Rather, the county collects untreated wastewater from the local collection entities

**RWSP 30-Year Capital  
Improvement Program**

and then conveys this wastewater to county-operated treatment facilities for treatment and discharge. The county's wastewater system serves about 1.4 million residents living mostly in urban areas of King County, southern Snohomish County, and northern Pierce County.

In 1999, the Metropolitan King County Council adopted Ordinance 13680, which updated the county's Comprehensive Water Pollution Abatement Plan. This update, commonly referred to as the Regional Wastewater Services Plan (RWSP), is a 30-year capital improvement program designed to provide adequate wastewater conveyance and treatment capacity and to protect aquatic resources as the region's population grows. The WTD is the agency directly responsible for implementation of the RWSP. To meet its mandate, the division designs, constructs, inspects, operates, and maintains all treatment and conveyance facilities in the King County wastewater system. The division's 2003 adopted budget includes \$275.3 million for capital expenditures and \$84.4 million for operating costs. Exhibit A illustrates actual and forecasted expenditures for 2000-2008. Support for the capital expenditures is generated by monthly residential and commercial fees, capacity charges for new system connections, and other sources such as grants, investments, and borrowing.

**EXHIBIT A**  
**WTD Capital and Operating Costs 2000 – 2008\***



\* 2000-2002 are actual expenditures, 2003-2008 are forecasted expenditures.

**SOURCE:** 2003 Adopted CIP

The WTD capital program is divided into two main functional areas:

- The *Asset Management* section handles projects that rehabilitate, improve, or upgrade existing facilities.
- The *Major Capital* section manages projects that provide new capacity or add capacity to existing facilities.

Chapter 2 reviews how the WTD major capital and asset management programs carry out their responsibilities consistent with best practices. It documents strengths and weaknesses of current management practices, as well as efforts currently underway that are intended to promote cost-effectiveness and greater accountability to ratepayers. Chapter 3 describes strengths and weaknesses of current data collection systems, analysis, and reporting activities, and describes the value of effective data management in implementing best management practices, supporting the needs of decision makers, and

promoting program accountability. Proposed frameworks for providing capital system and individual project information are provided in Appendices 2 and 3 to this report.

# 2 CAPITAL IMPROVEMENT PLANNING AND MANAGEMENT PRACTICES

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## Some Management Activities Fall Short of Best Practices... Improvements Planned

### Chapter Summary

This chapter describes how the King County WTD carries out its responsibilities for its capital improvement program (CIP) planning. It reviews how well WTD management activities align with CIP industry best management practices, and identifies where improvement should be made to promote greater efficiency and more accountability for the division's capital program.

### Summary of Findings

Overall, we found that WTD is making progress in improving management of its capital planning activities. However, some WTD practices for ensuring cost-effectiveness fall short of industry best practice standards. The WTD and the King County Office of Management and Budget (OMB) have ongoing and proposed initiatives to address most of these shortcomings.

### Summary of Recommendations

The following recommendations are intended to strengthen capital project management oversight and accountability:

- Analyze and integrate information about existing assets into the review of capital planning alternatives.
- Establish guidelines and models for conducting economic analysis.
- Develop a countywide discount rate policy.
- Consider and report on the impact to ratepayers of capital project alternatives.

- Refine the capital project ranking/prioritization system to include information about rate impacts and findings from analysis of existing assets.
- Conduct routine postproject reviews and use results to improve management of capital projects.

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## WTD CAPITAL IMPROVEMENT PROGRAM RESPONSIBILITIES

### WTD Responsible to Implement RWSP

As described earlier, the WTD is responsible for implementation of the county's Regional Wastewater Services Plan (RWSP), a 30-year capital improvement program designed to provide adequate wastewater conveyance and treatment capacity to the region. The WTD designs, constructs, inspects, operates, and maintains all treatment and conveyance facilities in the King County wastewater system.

### Manage Existing Assets and Build New Capacity

The WTD capital program is divided into two main functional areas.

- *The Asset Management* section handles projects that rehabilitate, improve, or upgrade existing facilities.
- *The Major Capital* section manages projects that provide new capacity or add capacity to existing facilities.

In order to better understand how the WTD performs its capital planning activities, we first reviewed industry best practice standards for capital program management. As cited later in this report, the primary sources of these practices are the U.S. General Accounting Office, the federal Office of Management and Budget, and the Government Accounting Standards Board. We followed our review of best practices with case studies of WTD capital and asset improvement projects. We specifically reviewed how these projects are managed consistent with the capital management best practices described below. A snapshot of our assessment of WTD performance in these areas is

provided in Exhibit B. In general, the division partially meets the best practice standards described in the following section.

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## BEST PRACTICES FOR CAPITAL IMPROVEMENT PLANNING

### Achieve Goals at Lowest Cost and Least Risk

The federal Office of Management and Budget and the General Accounting Office (GAO) define capital improvement planning as a planning and financial management process used by public sector agencies for identifying, prioritizing, and scheduling capital improvements. Effective capital programming uses long-range planning and a disciplined budget process as the basis for managing a portfolio of capital assets to achieve goals with the lowest life-cycle costs and least risk.

### Industry Best Practices

GAO identifies a variety of practices that leading organizations use to make capital investment decisions.<sup>1</sup> These include:

- Determining the gap between the capacity of current assets and planned results.
- Evaluating alternative approaches to achieving results.
- Integrating organizational goals into the capital decision-making process.
- Establishing a review and approval framework that is supported by analysis.
  - Evaluate and select capital assets using an investment approach.
  - Include a defined process for ranking and selecting projects.
- Tracking project costs, schedule, and performance.
- Evaluating results and incorporating lessons learned.

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<sup>1</sup> U.S. General Accounting Office, Water Infrastructure, Information on Financing, Capital Planning, GAO-02-764, August 2002; Creating Value Through World Class Financial Management, GAO-00-134, April 2000; Leading Practices in Capital Decision-Making, GAO/AIMD-99-32, December 1998.

<b>EXHIBIT B</b>				
<b>Consistency of WTD Performance with Best Management Practices</b>				
<b>BEST PRACTICE CRITERION</b>	<b>Meets</b>	<b>Partially Meets Improvements In Progress</b>	<b>Partially Meets Improvements Proposed</b>	<b>Does Not Meet Limited or No Improvements Proposed</b>
1. Determine the gap between the capacity of current assets and planned results.		✓		
2. Evaluate alternative approaches to achieving results.			✓	
3. Integrate organizational goals into the capital decision-making process.			✓	
4. Establish a review and approval framework supported by analysis.			✓	
5. Track project costs, schedule and performance			✓	
6. Evaluate results and incorporate lessons learned.				✓

**SOURCE:** King County Auditor's Office 2003

## WTD COMPLIANCE WITH KEY BEST PRACTICES

Exhibit B provides an overview of our assessment of the extent to which the WTD manages its capital planning activities consistent with the six industry best practices. For brevity, we focused the following section on our findings regarding three of the best practices that promote efficiency and effectiveness in capital planning. Areas where division activities align with best management practices and those where further work is warranted are identified for each. Appendix 2 provides a summary of our assessment of WTD performance of the remaining three capital planning best practices.

**Best Practice 1 - Determining the gap between the capacity of current assets and planned results****Need to Understand Capacity and Condition of Current Assets and...**

In order for the WTD to meet this best practice, the division must understand the condition of the current wastewater treatment infrastructure and how well that infrastructure will support regional growth, and comply with federal, state, and local health and environmental regulations.

We found that the WTD effectively analyzes flow conditions and uses accepted population estimates to project system capacity needs. Compliance with federal, state, and local regulations is reviewed and maintained on an ongoing basis.

**Ensure Optimal Timing of Refurbishment and Replacement**

To have full implementation of this best practice, however, WTD would need to ensure optimal timing of refurbishment and replacement of existing assets, which is a key to sound capital planning. Leading organizations maintain systems that capture and report information on the condition of existing assets and use it to plan for capital improvement projects and maintenance activities. This is critical for improving service reliability, minimizing cost of asset ownership, and reducing unplanned expensive events.

**Finding: WTD Comprehensive Analysis Lacking**

The WTD does not have a comprehensive or systemwide approach to analyzing the condition of its portfolio of existing assets. A variety of systems with information about the condition of the assets are maintained at the treatment facilities and at headquarters. Consequently, it is difficult to perform a comprehensive analysis of system assets. Comprehensive analysis would demonstrate that the WTD has considered the best use of available public resources, i.e., whether to use existing assets or purchase or construct new assets.

**WTD Taking Steps to Integrate Asset Information into CIP Activities**

The WTD is currently taking several steps to integrate this information into management of its capital planning activities. As examples:

- In 2001 the WTD centralized its asset management program to division headquarters, moving toward coordinating information about asset condition, repair and replacement with the major capital program decision-making.
- Standard asset assessment criteria are developed, and condition and cost information is being collected.
- An inventory of the condition of the conveyance system is completed. Inventories of other portions of the system are underway.
- A pilot project for inventory of pump stations is underway, and a framework for inventorying and maintaining all pump stations will be developed from this effort.

Continued implementation of these activities is critical to improving efficiency and accountability. Once the asset information is collected, implementation of the best practice is dependent upon the WTD analyzing the information and integrating asset information into its analysis of capital projects. Moreover, government accounting standards require reporting of capital infrastructure in the County's financial statements. Implementation of the above asset management activities will further support continued conformance to these standards.

This will demonstrate to ratepayers and decision makers that the value of existing assets are optimized and that any new acquisitions are likely to provide returns on investment that are clearly equal to or better than alternative uses of public resources.

**Best Practice 2 - Establish a review and approval framework supported by analysis**

**Need to Review and Select Projects Using an Investment Approach and...**

In order for the WTD to meet this best practice, it must ensure that management review and approval of projects is supported by the proper financial, technical, and risk analyses. Projects would need to be evaluated and selected using an investment approach and using a defined project ranking process based on preestablished criteria. These are critical factors in making sound capital investment decisions.

**Support Decisions with Detailed Economic and Financial Analysis**

**Decision packages need to be supported by detailed economic and financial analysis.** The federal Office of Management and Budget (OMB Circular A-94) cites cost benefit analysis as a recommended technique to use in formal economic analysis of government programs or projects. A project's costs and benefits can be understood when a life-cycle cost analysis (LCCA) of a potential project is conducted. LCCA is a method of calculating the total cost of ownership over the life of an asset. All quantifiable costs and benefits must be considered. Costs and benefits that are not quantifiable should be noted and also considered. The entire life of the project is to be used as the period of analysis. Key elements that must be considered are:

**Also Essential:  
Appropriate Discount Rate, the Cost of Borrowing to the Ratepayer, and Sensitivity Analysis**

- **Discount Rate Policy:** discount rate is used to determine the time value of money. This can be based on the cost of capital to the spender (ratepayer for WTD) and/or the return on investment that could be expected on an alternative investment.
- **Cost of Capital:** should be the cost of capital to the people who must ultimately pay for the project, which means the ratepayer, not the government entity itself.<sup>2</sup>

<sup>2</sup> Excerpt from federal OMB Circular A-94: Analyses should include comprehensive estimates of the expected benefits and costs to society based on established definitions and practices for program and policy evaluation. Social net benefits, and not the benefits and costs to the federal government [or government entity], should be the basis for evaluating government programs or policies that have effects on private citizens or other levels of government.

- Sensitivity Analysis: should be used to identify all of the critical cost variables (discount rate, useful lives, initial capital costs), and to know how sensitive the outcome of the analysis is to changes in key variables.

**Findings: WTD  
Guidelines for Life-  
Cycle Cost Analysis  
Lacking, and...**

**Absence of Countywide  
Discount Rate Policy**

**Decision Makers and  
Ratepayers Rely on  
Accurate Cost  
Estimations and ...**

Our case studies of WTD projects found that guidelines for conducting life-cycle cost analysis are lacking. Analytical approaches for analyzing project cost are inconsistent and in some instances flawed. For example, our case studies revealed that the WTD does not consistently use the entire useful life of proposed capital project alternatives when conducting life-cycle cost analysis. We also found that a variety of discount rates are used to calculate the time value of money over the life of the project. This is due in part to the absence of a countywide discount rate policy.

These inconsistencies lead to inaccurate calculations of capital project life-cycle costs and complicate comparisons of capital project alternatives not only within the WTD but across county government. As an example, we found it necessary to correct one of the case study analyses by using a more appropriate discount rate and by taking into account the useful lives of the assets in the project. In this instance the corrected analysis did not change the ranking of the preferred alternative.

Nevertheless, the rankings of lower cost alternatives did change, which could have been of major consequence had lower cost been a predominant factor in choosing among alternatives. The importance of using the correct discount rate and appropriate useful life of a project is that an accurate cost of project alternatives can be better estimated and relied upon by decision makers and ratepayers.

**Need to Know Benefits and Costs of Alternatives**

In addition, the regulatory, environmental and social benefits that vary among project alternatives can be partially measured and understood in relationship to varying costs of the project alternatives. For example, if one project alternative confers more benefits but at a higher cost than another alternative, those benefits can be quantified in terms of the cost difference between the alternatives. This kind of information can be of particular value to elected officials and other decision makers when they decide among alternatives.

**OMB Developing Discount Rate Policy**

Following our discussions with the King County Office of Management and Budget (OMB) during the course of the audit, OMB is beginning to develop a discount rate policy and guidelines consistent with capital best practice standards. In addition, the WTD has a number of activities underway that, if carried out consistent with the best practices described above, could address shortcomings in the WTD's current capital analysis process. These activities include:

**Ongoing WTD Activities Could Address Gaps**

- Development of a new capital project management system, including guidelines for conducting life-cycle cost analysis.
- Training for project managers.
- Approach to including impacts to rates of potential projects in analysis of alternatives.

**View All Proposed Project Investments and Existing Capital Assets as a Portfolio**

**Framework of Review Includes Ranking**

**Projects/Investments.** Establishing a strong framework for review and analysis also requires that the WTD have a defined project ranking process for selecting which capital projects to pursue. GAO has found that leading organizations rank proposed capital projects, using preestablished criteria, and that selection is based on a relative ranking of investment proposals. These organizations determine the right mix of projects by viewing all proposed investments and existing capital assets as a

portfolio. According to this best practice, alternatives should be evaluated using net present value. Projects should be ranked according to the discounted value of their expected benefits, less the discounted value of expected costs. Qualitative evaluation considerations, such as regulatory requirements, considerations of business strategy, or unquantifiable social benefits or costs may override quantitative criteria in deciding the final ranking of projects. The costs to taxpayers, i.e., rates, should be identified for projects that have a rate impact.

The WTD began a project ranking process in 2003. The process is in the early stages of development with the division developing appropriate ranking criteria and establishing an internal review panel represented by multiple disciplines. Recognizing that the new process is just getting underway, some key information for applying criteria and ranking projects was lacking or was not consistently provided. Missing or inconsistently provided were:

- Cost of alternatives
- Status of project milestones
- Regulatory constraints
- Link to overall system goals or system asset portfolio

WTD management has reviewed the 2003 project ranking process and has identified the above areas for improvement. We concur with WTD that training of project managers and analysis of information from the new project management system will help support future project ranking activities.

### **Best Practice 3 – Evaluate results and incorporate lessons learned**

#### **Monitor Project Scope, Schedule and Budget Information and...**

In order for the WTD to meet this best practice, key information about projects would need to be tracked after implementation. The division would need to monitor results to ensure that the project goals have been met and that resources have been used

efficiently and appropriately. Managers and decision makers should monitor the following areas:

**Review Project Performance and Incorporate Lessons Learned**

- cost and timeline estimates are met
- origin and cost of change orders are understood
- technical goals of project are met
- consumers' satisfaction is gathered

This information would need to be reviewed and used to improve the performance of future projects through a modification of the existing process.

**Finding: WTD Postproject Reviews Conducted on Ad-hoc Basis**

Presently the WTD conducts postproject reviews on an ad-hoc basis. Lessons learned from projects are neither formally nor routinely reviewed by project managers and supervisors. The WTD is in the process of updating its project management system and is planning to conduct training for project managers. This presents the opportunity for inclusion of a postproject review process. That process should meet capital management best practices if it includes the elements noted above and the information gathered is reviewed and used to improve division performance.

**WTD \$8M Contract for Project Management Expertise Helpful...but Does Not Ensure Best Practices...**

**Conclusion**

The WTD has a number of activities underway to address many of the findings noted above. Presently the division has an \$8 million contract with URS Corporation who is working with the WTD to develop a comprehensive capital project management system, as well as provide technical support on the RWSP program. While this expertise may be helpful, the WTD will need to address the issues noted above. Implementation of the following recommendations will provide a basis for improving accountability to decision makers and ratepayers, and for ensuring an effective capital planning process. Chapter 3 provides a framework for reporting WTD capital project information to decision makers.

**WTD to Address Findings and Follow-Up**

**RECOMMENDATION 1**      The WTD should analyze existing asset cost and condition information and integrate findings into financial analyses of capital planning alternatives.

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**RECOMMENDATION 2**      The WTD should establish guidelines and models for conducting economic analysis of capital project alternatives. In addition the Office of Management and Budget should develop and implement a countywide policy for calculating the time value of money.

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**RECOMMENDATION 3**      The WTD should analyze and report the impact on rates for proposed major capital and asset management project alternatives.

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**RECOMMENDATION 4**      The WTD should refine the capital project ranking/prioritization system to include consideration of rate impact and existing asset cost and condition information into ranking of proposed capital projects.

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**RECOMMENDATION 5**      The WTD should implement a postproject review process consistent with the best practice framework presented in this report.

# 3 CAPITAL PROGRAM INFORMATION AND PERFORMANCE REPORTING

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## Chapter Summary

This chapter describes our review of wastewater capital project and program data needs and the Wastewater Treatment Division's ability to manage and deliver needed data.

## Objectives

We surveyed councilmembers, council staff, and budget office staff and reviewed industry best practices to identify project and program data needed for effective decision-making and oversight. We also worked with the division to evaluate data availability, data management, and data reporting systems.

## Summary of Findings

We found that the data requested by decision makers and recommended for best practices implementation was available, though much was not tracked centrally or was of inconsistent quality. We also found that the data which was tracked centrally was underutilized, as the division missed opportunities to analyze its data and assess performance program-wide.

## Summary of Recommendations

We recommend that the division establish a standard data reporting framework that describes the performance of the wastewater capital program as a whole. At a minimum, the division should make available the data items requested by councilmembers, council staff, budget office staff, and suggested by industry best practices. A sample framework for reporting on the division's performance of its capital program is included as Appendix 2. A sample framework of the project data needed to

support the division's capital program reporting efforts is included as Appendix 3.

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## CAPITAL PROGRAM INFORMATION NEEDS

One of the primary objectives of our study was to develop a framework for providing wastewater capital project and program information to decision makers. Early in our study, councilmembers and staff expressed concern over the limited nature of information routinely made available to council. The council depends on quality data as it reviews wastewater policy and requests for capital funding.

### Information to Support Council Rate and Budget Decision- Making

#### Council Review

At a minimum, the council reviews three pieces of legislation related to wastewater treatment each year, and also reviews, comments on, and has the opportunity to change an annual reallocation of wastewater capital funding. These review processes are described below in typical order of appearance before the council.

**Capital Improvement Program Reconciliation.** This annual countywide effort occurs in the second quarter of each year. The reconciliation process includes analyzing and determining appropriation carryover, verifying the availability of revenue, balancing projects with overexpenditures, and revising project schedules.

**Capital Funding Reallocation.** On or before April 15<sup>th</sup>, the division must submit a wastewater capital funding reallocation proposal and project status report to the council. The division's 'flexible response budgeting,' approved by the council in 2001, allows the division to shift funds between adopted projects without council approval. However, the council has an

opportunity to review proposed reallocations and may take action to prevent them from taking effect. Councilmembers and staff need to understand how projects have changed with respect to scope, schedule, and budget and how discrete projects are interrelated in order to evaluate the funding reallocation proposal.

**Sewer Rate and Capacity Charge.** On or before June 30<sup>th</sup>, the county must establish a monthly sewer rate for the following year. This is required under the county's service contract with the local sewer districts and allows these districts to build King County rates into their own rate structure during the fall. The sewer rate is based on the division's estimated operations and capital budget needs for the following year. Councilmembers and staff need to understand how these needs were identified, how proposed projects will address these needs, how estimated costs were calculated, and how discrete operations and capital costs relate to the monthly rate.

Concurrent with adoption of the sewer rate, the county also establishes a capacity charge for the coming year. This charge may not exceed the cost of capital facilities necessary to serve new customers (those establishing new connections to the system). Councilmembers and staff need to understand how decisions the council is asked to make will impact the capacity charge over the long term.

**Annual Budget Review and Adoption.** On or before October 17<sup>th</sup>, the executive transmits to the council the proposed county operating and capital budgets for the following year. Though the council appropriates wastewater capital expenditures at the fund level only, a list of projects also must be approved. Appropriated funding goes only to projects on this approved list.

Councilmembers and staff need adequate information on each

proposed project as they review and consider approving the proposed project list.

#### **The Office of Management and Budget Role**

#### **Quality Data to Support Budget Office Review of Division Proposals...**

The King County Office of Management and Budget (OMB) plays a key role in reviewing wastewater proposals prior to legislative transmittal. All wastewater capital funding requests (including the legislation described above) are developed by the division, and then sent to OMB for review. Budget analysts need quality data on project and program performance in order to review division proposals fully. In this respect, their data needs are similar to those of the council.

#### **The Role of the Division**

#### **...and Implementation of Best Management Practices by WTD Managers**

As discussed in Chapter 2, full implementation of best management practices is critical to ensuring efficient and effective wastewater service delivery at the lowest cost to ratepayers. Implementing best management practices, however, requires that WTD managers have ready access to data describing current and evolving conditions. Division managers in turn can use this data to make informed decisions regarding project selection and prioritization and changes to scope, schedule, or budget. As many of these decisions will be reviewed by the budget office and the council, a parity of information between division managers, budget analysts, and the council would facilitate review.

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### **CAPITAL PROGRAM PERFORMANCE TRACKING AND REPORTING**

#### **Measure and Report Capital Program Performance**

Developing performance measurement techniques has been a county priority for some time and is of particular interest to the council. In general, performance measurement involves establishing a performance baseline, setting goals for future performance, then tracking and reporting actual performance

**Need to Report Whether Projects are Delivered on Time and Within Budget**

against the baseline and the goals. Summary data which describes program performance – e.g., the percentage of projects brought in on time; the percentage of projects brought in on budget; the relative success of small, medium, and large projects with respect to time and budget – could provide a mechanism for measuring the division’s success. Appendix 2 provides examples of how data could be summarized to report on WTD capital program performance. This reporting would facilitate council and budget office oversight as well as WTD implementation of best management practices.

**Value of a Standard Reporting Data Set**

**Support Performance Reporting with a Standard Data Set**

A standard reporting data set could support the program reporting described above, and the best management practices explained in Chapter 2. Information detailing project background, scope, schedule, and budget – from project inception to completion – should support capital program management and reporting.

**Data User Survey.** To identify key data elements appropriate for this data set, we worked with data users, industry best practices documentation, and existing county code reporting requirements. The result was a discrete set of project data elements, described below and provided in sample template form as Appendix 3.

**Data Users Requested Better Data on Project Background, Scope, Schedule, and Budget**

To gather input from data users, we surveyed councilmembers, council staff, and budget office staff asking what wastewater project data would be most useful to them. Most data users mentioned the need for background information on projects, as well as original and current estimates for project scope, schedule, and budget.

**Best Management Practices Recommend Tracking Similar Data to That Requested By Data Users**

**Wastewater CIP Best Practices Review.** Chapter 2 of this report describes our review of best management practices for wastewater capital projects. This review resulted in a set of recommended best management practice strategies. Implementation of these strategies is dependent on accurate reporting and analysis of key data. This key data included nearly all of the elements requested by analysts and decision makers in our data user survey.

**County Code Review.** We also reviewed existing King County code requirements relating to wastewater capital project reporting.<sup>3</sup> In general, each legislative transmittal requires a companion report intended to support review of the proposal it accompanies. Code requires many of the data elements requested by data users and suggested by best practices review. Code also requires elements – for the most part those used to label and categorize projects – which were not identified elsewhere but which support implementation of best practices.

**Data Set Development.** Based on user input, our best practices research, and our review of county code, we were able to develop a set of data elements which we believe could support program-wide reporting described above, be accessed to respond to specific stakeholder needs, and enable and facilitate the implementation of industry best practices. These elements group into five categories:

- **Project Identification** – data elements which can be used to label and categorize projects and which are used to distinguish one project from another.
- **Project Background, Selection, and Prioritization** – data elements which document project origin; relationship to agency goals, previous actions, and other capital

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<sup>3</sup> King County Code, sections 4.04.020, 4.04.030, 4.04.280, & 4.40.015

projects; alternatives considered; reasons for selecting the preferred alternative; and rationale for project prioritization.

- **Project Scope** – data elements documenting original project scope and any subsequent changes to that scope.
- **Project Schedule** – data elements documenting key milestones in original and current estimated project timeline.
- **Project Budget** – data elements documenting total project cost estimate history, cost estimates and actual expenditures by phase and work category, appropriations and expenditure history, and relationship to monthly rate and capacity charge.

Standard data elements in the areas described above provide the opportunity for decision makers to access relevant capital project performance information. The full set of sample data elements is included as Appendix 3.

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## WTD DATA MANAGEMENT AND DELIVERY – FINDINGS

### Current Data Management Practices

**Most Essential Data is Available, Though Much is Not Tracked Centrally**

The Auditor’s Office worked with the division to evaluate data availability and data management systems. We found that most data, requested by stakeholders and also needed to implement best management practices, is available. However, we also found that much of this data is scattered across reports and data systems; only a portion of the data is tracked centrally and is easy to retrieve. A new data management system currently is being developed for the agency by URS Construction Services. Although we did not conduct an independent assessment of the URS proposal, it is important that the final version of this system

have the capacity to maintain all appropriate data centrally. The system is expected to come online in 2004.

**Central Data is of Inconsistent Quality**

Within the current data management system, we found problems with data consistency. This may be due to poor data control, as the division has no standard protocol for managing data entry, and the division does not have a data dictionary defining the data elements the system is intended to capture. This also may be due to the diffuse nature of project origination within the division, as some projects originate in central planning while others originate with treatment plant personnel. Because project data is developed in a variety of settings, effective data control takes on more importance.

**Central Data is Under-Utilized in Assessing Capital Program Performance**

Central data gaps and inconsistencies notwithstanding, the division does have data which it can use to analyze project and program performance. However, we found that much of the data currently tracked is underutilized. The division does not take full advantage of opportunities to analyze its data and assess performance program-wide. As discussed earlier such program-wide review is essential when implementing best management practices and also would benefit decision makers.

**Current Data Reporting**

**The Division Meets Current Reporting Requirements, but Required Reports Do Not Meet Stakeholder Needs**

We found that for the most part, the division meets its reporting requirements as specified by the King County code. However, we found that the data elements currently required by code do not meet the needs of councilmembers, council staff, and budget office staff. As described in Chapter 2, our review of WTD project selection and prioritization found that WTD managers face similar problems. As current reports do not meet council and budget office needs, they also cannot fully meet the needs of the division.

**Current Reporting Requirements May Be Unduly Burdensome for the Agency**

The WTD indicates that existing reporting requirements are burdensome for the agency. Current code requires different sets of information delivered at different times of year. This means the agency must prepare multiple reports, none of which supplies all data requested by decision makers or suggested by best practices review. In addition, each report must be assembled from multiple sources and systems, complicating report delivery. A comprehensive data framework allows opportunities to routinely extract a summary of program performance information as described in Appendix 2, and access to detailed project performance information as necessary. The agency believes its new data management system will facilitate this reporting.

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**RECOMMENDATION 6**

The WTD should work to ensure that the new capital project data management system being developed by URS Construction Services is able to capture, track, and report all data elements requested by decision makers and needed to support best management practices.

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**RECOMMENDATION 7**

The WTD should develop standard processes for defining, capturing, and controlling for quality all data tracked by its current and pending data management systems.

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**RECOMMENDATION 8**

The WTD should develop standard processes for analyzing its data and providing clear overviews of program performance consistent with the frameworks provided in Appendix 2. Program summary data should be provided to decision makers at regular intervals and should enable concise and comprehensive assessment of the effectiveness of the WTD capital program.

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**RECOMMENDATION 9**      The WTD should work with decision makers to refine and/or implement the sample reporting data set developed by our office and provided in Appendix 3. In general, the same data that division management uses to make decisions about funding reallocations, project prioritizations, service rates, and program performance reporting should be routinely available to those who review and approve those decisions.

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**RECOMMENDATION 10**      The WTD should work with councilmembers, council staff, and budget office staff to update code requirements for wastewater capital reporting. Objectives for this effort should include (1) codifying the data needs identified by this review, and (2) reducing the number of required reports, if possible, consistent with meeting those needs as illustrated in Appendix 2.

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**RECOMMENDATION 11**      The WTD should provide a briefing to the council on the status of implementation of the recommendations made in this report.

## **APPENDICES**

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## LIST OF RECOMMENDATIONS & IMPLEMENTATION SCHEDULE

### **Recommendation 1:**

The WTD should analyze existing asset cost and condition information and integrate findings into financial analyses of capital planning alternatives.

**Implementation Date:** October 2008, with annual progress reports to the council beginning October 2004.

**Estimate of Impact:** Efficiency improvements expected.

### **Recommendation 2:**

The WTD should establish guidelines and models for conducting economic analysis of capital project alternatives. In addition, the Office of Management and Budget needs to develop and implement a countywide policy for calculating the time value of money.

**Implementation Date:** March 2004

**Estimate of Impact:** Efficiency improvements expected.

### **Recommendation 3:**

The WTD should analyze and report the impact on rates for proposed major capital and asset management project alternatives.

**Implementation Date:** March 2004

**Estimate of Impact:** Improved accountability to council and ratepayers.

### **Recommendation 4:**

The WTD should refine the capital project ranking/prioritization system to include consideration of rate impact and existing asset cost and condition information into ranking proposed capital projects.

**Implementation Date:** April 2004

**Estimate of Impact:** Efficiency improvements expected and improved accountability to council and ratepayers.

## LIST OF RECOMMENDATIONS & IMPLEMENTATION SCHEDULE (Continued)

### **Recommendation 5:**

The WTD should implement a postproject review process consistent with the best practice framework presented in this report.

**Implementation Date:** June 2004

**Estimate of Impact:** Efficiency and effectiveness improvements expected.

### **Recommendation 6:**

The WTD should work to ensure that the new capital project data management system being developed by URS Construction Services is able to capture, track, and report all data elements requested by decision makers and needed to support best management practices.

**Implementation Date:** July 2004

**Estimate of Impact:** Efficiency improvements expected and improved accountability to council and ratepayers.

### **Recommendation 7:**

The WTD should develop standard processes for defining, capturing, and controlling for quality all data tracked by its current and pending data management systems.

**Implementation Date:** July 2004

**Estimate of Impact:** Efficiency and effectiveness improvements expected.

### **Recommendation 8:**

The WTD should develop standard processes for analyzing its data and providing clear overviews of program-wide performance consistent with the frameworks provided in Appendix 2. Program summary data should be provided to decision makers at regular intervals and should enable concise and comprehensive assessment of the effectiveness of the WTD capital program.

**Implementation Date:** July 2004

**Estimate of Impact:** Efficiency improvements expected and improved accountability to council and ratepayers.

## LIST OF RECOMMENDATIONS & IMPLEMENTATION SCHEDULE (Continued)

### **Recommendation 9:**

The WTD should work with decision makers to refine and/or implement the sample reporting data set developed by our office and provided in Appendix 3. In general, the same data that division management uses to make decisions about funding reallocations, project prioritizations, service rates, and program performance reporting should be made available to those who review and approve those decisions.

**Implementation Date:** January 2004

**Estimate of Impact:** Efficiency improvements expected and improved accountability to council and ratepayers.

### **Recommendation 10:**

The WTD should work with councilmembers, council staff, and budget office staff to update code requirements for wastewater capital reporting. Objectives for this effort should include (1) codifying the data needs identified by this review, and (2) reducing the number of required reports, if possible, consistent with the program performance overview tables provided in Appendix 2.

**Implementation Date:** June 2004

**Estimate of Impact:** Efficiency and effectiveness improvements expected.

**Note:** This recommendation requires legislation.

### **Recommendation 11:**

The WTD should provide a briefing to the council on the status of implementation of the recommendations made in this report.

**Implementation Date:** October 2004

**Estimate of Impact:** Improved accountability to council and ratepayers.

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## EXECUTIVE RESPONSE



**King County**

**Ron Sims**  
King County Executive  
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**RECEIVED**

**SEP 15 2003**

**KING COUNTY AUDITOR**

September 15, 2003

TO: Cheryle Broom, King County Auditor

FM: Ron Sims, King County Executive

RE: Proposed Final Report – Wastewater Treatment Division Capital Planning

Thank you for sending the auditor's review of how the King County Wastewater Treatment Division carries out its capital management program. I want to thank you and your staff for the collaborative and professional approach taken during this comprehensive review.

We agree with all of the recommendations you have made to improve what I believe is already an excellent program. As you noted in your report, many of the recommendations for improvements represent work that has been identified as an area to improve by the Division and the work is already underway. The added cost to make these improvements will improve accountability and save money in the long run. I have attached a table of our comments on all the audit recommendations.

There are two areas in which we will need to work further with you and the King County Council to come to an agreement on the best approach. First, a discount rate policy; we all agree there should be a written county-wide discount policy to use in analyzing and making decisions about capital projects. However, the content of that policy must be further discussed. I have asked Steve Call, our budget director, to form a team of financing experts from the affected departments and from the Auditor's office to discuss a discount rate policy and establish a recommendation.

Secondly, we would like to continue working with you and King County Council on the data management and reporting recommendations. We are largely in agreement on what is proposed but there may be some modifications necessary to enable us to cost-effectively use our financial and project management systems to generate the information requested. We also want to ensure that we are providing meaningful information about project-specific rate impacts. Rate impacts are tremendously important and valuable in comparing large project alternatives but for smaller projects, the relative impacts on rates is less informing and useful in making decisions because of the financing methods and number of variables that go into the rate in any given year.

## EXECUTIVE RESPONSE (Continued)

Cheryle Broom  
September 15, 2003  
Page 2

I would also like to acknowledge the many programmatic practices we are doing well. Recently, six large wastewater utilities in California undertook a benchmarking effort to look at how they were doing performing their capital improvement programs. They identified 38 best management practices (BMPs) to compare themselves against. We looked at how well we are conforming to these BMPs and found that the Wastewater Treatment Division has already implemented nearly all of them or implementation is underway. I have attached a table summarizing these BMPs and our progress in implementing them.

What is even more important is getting projects done. Our Wastewater Treatment Division gets projects done. We have consistently met an annual accomplishment rate of 75 percent and are expected to exceed that this year.

We must still get better. Around the country, water and wastewater utilities finding that many of their assets are reaching the end of their useful life are having to make substantial investments in the coming years. Although we do extremely well maintaining our wastewater infrastructure, we must be ready to make the right investments at the right time to maintain the high levels of service and reliability we have achieved.

Additionally, we will be making substantial investments in the future to meet the needs of our growing region and comply with regulations to protect public health and water quality. The magnitude of these investments warrants careful and regular monitoring of our performance to ensure we are meeting our mission in the most cost-effective way.

I look forward to working with you and the King County Council in implementing these recommendations.

Enclosures

cc: Steve Call, Director, Office of Management and Budget (OMB)  
Pam Bissonnette, Director, Department of Natural Resources and Parks (DNRP)  
Bob Cowan, Division Director, Finance and Business Operations Division, Department  
of Executive Services  
Don Theiler, Division Director, Wastewater Treatment Division (WTD), DNRP  
Christie True, Manager, Major Capital Improvements Section, WTD, DNRP  
David Lawson, Manager, Executive Audit Services, OMB

## EXECUTIVE RESPONSE (Continued)

### Attachment A Response to Proposed Final Report Wastewater Treatment Division Capital Planning

Category	Recommended/Common BMPs	WTD Status
Planning	Complete feasibility studies on projects prior to defining budget and scope	In practice
	Have a board/council project prioritization system	Project prioritization system based on policy established by Council and implemented by WTD; new system being implemented
	Provide resource loading for projects listed in the CIP for design and construction	Implementation program-wide underway
	Capital projects are well defined with respect to scope and budget at the end of the planning phase	WTD practice provides for scope and budget to be well defined during predesign in order keep allied costs down
	There is a master schedule attached to the CIP that identifies start and finish dates for projects	In practice
	Projects shown on a geographic information system	In practice
Design	Define requirements for reliability, maintenance, and operation prior to design start	In practice, standardization across projects underway
	Provide a clear, precise scope to designers prior to design start	In practice
	Adapt successful designs to project sites whenever possible (e.g. fire stations, gymnasiums, etc.)	In practice
	Develop and use Green Buildings standards	New policy being implemented
	Designers are required to provide a work plan or design schedule prior to design start	In practice
	Designs are done on 2D CAD systems	In practice, some being done in 3D
QA/QC	Use a formal quality management system	In practice, more improvements planned
	Develop and use a standardized project delivery manual	In practice
	Perform a formal value engineering (VE) study for projects larger than \$1,000,000	Formal VE done on a case-by- case basis, judgment used to ensure benefit to be gained with additional costs
	Perform and use post-project reviews for lessons learned	Practice is inconsistent, will be implemented
	Agency uses standard forms for RFIs, change orders, pay applications, field clarifications, minutes of meetings, etc.	In practice
	Inspectors are trained and, when required, certified	In practice

## EXECUTIVE RESPONSE (Continued)

Category	Recommended/Common BMPs	WTD Status
Construction Management	Involve the construction management team before completion of design	Policy is to follow this practice but resource limits make it difficult
	Set aside 15% for construction change order contingency	WTD uses 10% when at construction phase and historical practice demonstrates this is adequate for design/bid/build
	Delegate authority to the city engineer/public works director to approve change orders to the contingency amount	In practice
	Classify types of changes	Implementation underway
	Include a formal dispute resolution procedure in all contract agreements	In practice; procedure varies depending about job underway
	Use a team building process for projects greater than \$5 million	In practice
	Delegate authority for change order approval to the departments in order to reduce paperwork	In practice
	Establish award limits for construction to support award by the director without a board approval	In practice
	Establish a prequalification process for contractors for large, complex projects	In practice to the extent this can be done following Washington state law; productivity initiative will allow more innovation
	A change order contingency is set aside at the start of the project	In practice
	A formal change order process is in place, which defines all forms and methods necessary to finalize change orders	In practice
Project Management	Assign a client representative to every project	In practice
	Provide formal training for project managers on a regular basis	In practice
	A project manager is assigned to every project	In practice
	Project manager has “cradle to grave” involvement	In practice
	A standard project control system has been adopted by the agency and is in use on all projects	Implementation underway

## EXECUTIVE RESPONSE (Continued)

Category	Recommended/Common BMPs	WTD Status
Consultant Selection and Use	Delegate authority to the public works director/city engineer to approve consultant contracts under \$25,000 when a formal RFP selection process is used	In practice
	Implement and use a consultant rating system that identifies quality of consultant performance	Not practiced
	The consultant selection process is qualification-based	In practice
	A standard consultant contract is included in the RFQ/RFP	Implementation underway
	An annual RFQ/RFP solicitation is used to develop an on-call list of preapproved consultants	Similar approaches in practice

## EXECUTIVE RESPONSE (Continued)

### Attachment B Response to Proposed Final Report Wastewater Treatment Division Capital Planning

Recommendation	Agency Position	Schedule for Implementation	Comments
1	Concur	Schedule as noted	
2	Concur	Schedule as noted	
3	Concur	Schedule as noted	
4	Concur	Schedule as noted	
5	Concur	Schedule as noted	
6	Partially concur	Schedule as noted	While we believe the majority of data elements can be captured, financial system limitations may prove too difficult and expensive for some elements.
7	Concur	Schedule as noted	
8	Partially concur	Schedule as noted	While we believe the majority of data elements can be captured, financial system limitations may prove too difficult and expensive for some elements.
9	Partially concur	Schedule as noted	While we believe the majority of data elements can be captured, financial system limitations may prove too difficult and expensive for some elements.
10	Concur	Schedule as noted	
11	Concur	Schedule as noted	

## APPENDIX 1

### WTD PERFORMANCE OF THREE REMAINING CAPITAL PLANNING BEST PRACTICES

Best Practice	WTD Activities
<p><b>Evaluate alternative approaches to achieving results. Consider a wide range of options (including non-capital investments).</b></p> <ul style="list-style-type: none"> <li>• Does this program need to be undertaken by the public agency?</li> <li>• Does the investment support work processes that have been simplified or otherwise redesigned to reduce costs, improve effectiveness, and make maximum use of commercial technology?</li> </ul>	<p>Privatization of services is not routinely evaluated by the WTD. Alternatives are considered for new major capital projects during predesign. However, the review of alternatives is limited by audit finding re: lack of asset management system documenting existing condition and cost information (Chapter 2 of report). In addition, historical construction cost information is routinely used to plan and project the capital cost of a project. Analyses of simplified work processes are not routinely incorporated into planning and projecting project costs.</p> <p>WTD reports that new technologies reviewed on selective, case-by-case basis during predesign. For example: centrifuges for dewatering solids, more efficient motors, generators, cogeneration and fuel cells, use of new processes for treatment.</p>
<p><b>Integrate organizational goals into the capital decision-making process.</b></p> <ul style="list-style-type: none"> <li>• Does the investment in a major capital asset support the core/priority mission functions performed by the public entity?</li> </ul> <p>Deliver new facilities and maintain existing ones to meet the wastewater infrastructure needs of our region. Our projects preserve natural resources, safeguard public health, and protect ratepayer's investments. <i>(source: WTD CIP Mission Statement).</i></p>	<p>WTD focuses on protection of the environment consistent with state and federal regulations, and county code. Population forecasts and flow projections are routinely reviewed. Consistent with the division's mission, public health is safeguarded as evidenced by reduction to discharge events. The WTD has completed the inventory of the conveyance system and a pilot project to implement a pump station inventory system is in progress. However, ratepayers' investments are not analyzed to ensure that maintenance, repair and replacement are scheduled at optimum level.</p>
<p><b>Track project costs, schedule and performance.</b></p> <ul style="list-style-type: none"> <li>• Good information provided to decision makers (cost-estimates, risks, and scope);</li> <li>• Project monitored against cost, schedule, and technical performance goals; risks identified and managed.</li> </ul>	<p>WTD project managers have responsibility to review summary project/cost data. The information is analyzed by WTD finance and capital program managers at the WTD system level during budget planning, re-allocation, and rate setting processes. Major scope changes also receive WTD management review. However, reporting of this information to decision makers is inadequate. Specifically, an approach to tracking, analyzing and reporting key information (scope, schedule, and budget) about a project or group of projects when there is change to project scopes is inconsistent. Chapter 3 of this audit identifies key data reporting elements that need to be comprehensively analyzed and reported to decision makers. Revisions to the WTD capital project management system and data system are underway.</p>

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## APPENDIX 2

### EXAMPLES OF PROGRAM PERFORMANCE OVERVIEW TABLES

Managers and decision makers need program summary data which enables them to assess performance program-wide, and selectively by various categories. Summaries of cost and schedule data by project category, size, or expected duration would be useful for management and oversight. Such summaries maximize the value of project-specific data and could be provided by accessing information from the detailed data set illustrated in Appendix 3. Examples are provided below.

#### Cost Changes

<b>Total Project Cost Overruns by Functional Category - [Time Period]</b>					
Functional Category	Number of Projects	Average Winning Bid	Average Cost Overrun (%)	Maximum Cost Overrun (%)	Minimum Cost Overrun (%)
South Treatment Plant West Treatment Plant Brightwater Treatment Plant Vashon Treatment Plant Conveyance Pipelines and Storage Conveyance Pump Stations Combined Sewer Overflow Control Infiltration and Inflow Control Biosolids Recycling Water Reuse Environmental Laboratory Central Functions					
<b>Overall</b>					

<b>Construction Cost Overruns by Primary Category - [Time Period]</b>					
Primary Category	Number of Projects	Average Winning Bid	Average Cost Overrun (%)	Maximum Cost Overrun (%)	Minimum Cost Overrun (%)
Major Asset Management New Facilities and Improvements Odor Control Power Management Minor Asset Management					
<b>Overall</b>					

## APPENDIX 2 (Continued)

<b>Allied Cost Overruns by Project Size - [Time Period]</b>					
Size of Winning Bid	Number of Projects	Average Winning Bid	Average Cost Overrun (%)	Maximum Cost Overrun (%)	Minimum Cost Overrun (%)
<250K 250K-500K 500K-750K etc.					
<b>Overall</b>					

### Schedule Changes

<b>Construction Schedule Overruns by Project Duration - [Time Period]</b>					
Expected Duration of Construction	Number of Projects	Average Winning Bid	Average Schedule Overrun (Days)	Maximum Schedule Overrun (Days)	Minimum Schedule Overrun (Days)
<50 50-99 100-149 etc.					
<b>Overall</b>					

<b>Total Project Schedule Overruns by Primary Category - [Time Period]</b>					
Primary Category	Number of Projects	Average Winning Bid	Average Schedule Overrun (Days)	Maximum Schedule Overrun (Days)	Minimum Schedule Overrun (Days)
Major Asset Management New Facilities and Improvements Odor Control Power Management Minor Asset Management					
<b>Overall</b>					

## APPENDIX 3

### SAMPLE PROJECT DATA SET REPORTING FRAMEWORK

As discussed in Chapter 3, one primary objective of this study was to identify project data to support capital program performance reporting as presented in Appendix 2. This data framework would also be useful to wastewater capital program managers. Best management practices review yielded a set of discrete data elements needed by managers. A survey of decision makers and staff yielded a set of data elements similar to that identified through best practices review and summarized in Appendix 2.

**PROJECT IDENTIFICATION**

Project Number:

Project Name/Title:

Functional Category:   
*Major AM, New Fac, Odor Control, Power Mgmt: STP, WTP, BTP, VTP, C Pipes & Stor, C Pumps, CSO Control, I/I Control, Biosol Recyc, H2O Reuse, Envl Lab, Central Functions; Minor AM: S&S Improve, Mech Eq, Odor and Corrod, Process Replace/Improve, Elec & Instr Control*

Primary Category:   
*Major Asset Mgmt, New Facil & Improvements, Odor Control, Power Mgmt, Minor Asset Mgmt*

Council District:

Project Description:   
*Brief statement describing what project will do or accomplish.*

**PROJECT BACKGROUND, SELECTION, PRIORITIZATION**

Origin of Project Proposal:

Project Origin/Need for Project:   
*Briefly describe problem or question that led to project initiation. (Include for future reference the name(s) and date(s) of issue of any report(s) or other documentation that identified the problem or question.)*

Conformance with Agency Goals; Linkage to WW Operations and Other WW Capital Projects; Presence of Signed Contracts, Negotiated Agreements, Adopted Legislation, Court Orders, etc.:

*Briefly describe how project supports WTD goals and objectives, how it links to other wastewater projects and operating concerns, and any relevant legal context and framework. Should explain how project fits into the "bigger picture".*

Alternatives Considered and Compared:

*Briefly describe what alternatives were considered to solve the problem or answer the question. (Include for future reference the name(s) and date(s) of issue of any report(s) or other documentation where analysis of alternatives was described.)*

Preferred Alternative and Reasons for Selecting It:

*Briefly describe preferred alternative and reason for selecting it. Include for future reference the name(s) and date(s) of issue of any negotiated agreement(s), legislation, court order(s), or other documentation which were involved in selecting the preferred alternative.*

Project Selection and Ranking:

Conformance with Project Selection and Ranking Criteria:

*Criterion #1. Include statement describing how project satisfies this criteria.*

*Criterion #2. Include statement describing how project satisfies this criteria.*

*Criterion #3. Include statement describing how project satisfies this criteria.*

## APPENDIX 3 (Continued)

<b>Criterion #4.</b>	Include statement describing how project satisfies this criteria.
<b>Criterion #5.</b>	Include statement describing how project satisfies this criteria.
<b>PROJECT SCOPE</b>	
Original Project Scope:	Briefly describe what project was expected to entail/include at close of planning phase.
Current Project Scope:	Briefly describe what project currently is expected to entail/include.
Changes to Original Scope:	Briefly describe changes to planning phase (original) scope and include dates.
Reasons for Changes:	Briefly describe reasons for changes between original scope and current scope.

<b>PROJECT SCHEDULE</b>									
START DATE (Level 1 Detail from PM DB)	Planned Start Date (Original)	Planned Completion Date (Original)	Planned Total Days (Original)	Estimated Start Date (Current)	Estimated Completion Date (Current)	Estimated Total Days (Current)	Actual Start Date	Actual Completion Date	Actual Total Days
Project Phase: 1 - Planning Milestone Milestone									
2 - Pre-design Milestone Milestone									
3 - Design Milestone Milestone									
4 - Implementation Milestone Milestone									
5 - Closeout Milestone Milestone									
6 - Land Acquisition Milestone									
Reasons for Early Completion or Delay:									

APPENDIX 3 (Continued)

Current Phase - Cnty Standard:

Current Phase - WTD In-House:

**PROJECT BUDGET**

COST ESTIMATE HISTORY	Estimated Total Project Cost	Range of Uncertainty (Low-End - Select)	Range of Uncertainty (High-End - Select)	Reasons for Selecting Range of Uncertainty Based on Potential Complications
<b>Project Phase:</b> Planning Estimate Pre-design (30%) Estimate Design (60%) Estimate Design (90%) Estimate Final Design (100%) Estimate Winning Bid		-20% to -50% -15% to -30% -10% to -20% -5% to -15% -3% to -10	+30% to +100% +20% to +50% +10 to +30% +5% to +20% +3% to +15%	

COST ESTIMATES BY PHASE (Based on Pre-design Estimate)	Estimated Cost of Phase	Estimated Percentage of Total	Actual Cost of Phase	Actual Percentage of Total
<b>Project Phase</b> 1 - Planning 2 - Pre-design 3 - Design 4 - Implementation 5 - Closeout 6 - Land Acquisition Total				

COST ESTIMATES BY WORK TYPE (Based on Pre-design Estimate)	Estimated Cost of Work Type	Estimated Percentage of Total	Actual Cost of Work Type	Actual Percentage of Total
<b>Project Phase:</b> Construction Allied Costs Land and ROW Acquisition Permits Art Allowance Sales Tax Contingency Total				

APPROPRIATION AND CASH FLOW	1999	2000	2001	2002	2003	2004	2005	2006
2222 CIP Appropriation Est. Cash Flow Actual	????							
1999 CIP Appropriation Est. Cash Flow Actual								
2000 CIP Appropriation Est. Cash Flow Actual								
2001 CIP Appropriation Est. Cash Flow Actual								
<b>Total</b>								

