

**PERFORMANCE AUDIT OF TRANSIT
SUMMARY REPORT**



King County

Presented to
the Metropolitan King County Council
Government Accountability & Oversight Committee
by the
County Auditor's Office

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Report No. 2009-01
September 15, 2009



King County

Metropolitan King County Council

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MEMORANDUM

DATE: September 15, 2009

TO: Metropolitan King County Councilmembers

FROM: Cheryle A. Broom, County Auditor

SUBJECT: Performance Audit of Transit

Attached for your review is the final summary report of the Transit Performance Audit. The audit objective was to review and evaluate several areas of Transit that are included in a series of technical reports that are also available for your review and include:

1. Technical Report A evaluates financial planning, capital planning, trolley replacement, and fare strategies;
2. Technical Report B describes bus service development;
3. Technical Report C includes discussion of operator and transit police staffing;
4. Technical Report D evaluates Access paratransit services;
5. Technical Report E reviews vehicle maintenance; and
6. Technical Report F includes ridership data and emergency customer communications.

The general audit conclusion is that some ways in which Transit pursues its mission have contributed to higher costs - a situation that is exacerbated by the economic environment. In addition, Transit could achieve cost savings and generate revenues through enhanced planning and more systematic data analysis. The audit identifies up to \$37 million in opportunities for annual savings and up to \$54 million in options for increased annual revenue in addition to \$105 million in one-time savings. Some of these savings or revenues would require specific policy choices by decision-makers. Depending on the approach taken by Transit to implement the recommendations, savings or revenues could be incremental and take multiple years to realize or could require additional resources.

The County Executive has provided a response to the 34 recommendations made in this report. The executive concurs with 31 of these recommendations, partially concurs with one recommendation, and does not concur with two recommendations. The response also includes proposed implementation timelines. See the appendices section for the complete text of the Executive Response and the Auditor's Comments to the Executive Response.

We appreciate the time and effort expended by Transit management and staff; they were professional and responsive. We were encouraged that, in some cases, Transit began implementing resolutions to audit concerns quickly after they were identified.

CB:KW:jl

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Through objective and independent audits and services, we promote and improve performance, accountability, and transparency in King County government.

Auditor's Office Vision

Our work is of the highest quality and integrity resulting in significant improvements in accountability, performance, and efficiency in county government, and it promotes public trust.



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The King County Auditor's Office provides oversight of county government

through independent audits and other studies regarding the performance and efficiency of agencies and programs, compliance with mandates, and integrity of financial management systems. The office reports the results of each audit or study to the Metropolitan King County Council.

The King County Auditor's Office performs its work in accordance with applicable Government Auditing Standards.



Audit and study reports are available on our Web site (www.kingcounty.gov/operations/auditor.aspx) in two formats: entire reports in PDF format (1999 to present) and report summaries (1992 to present). Copies of reports can also be requested by mail at 516 Third Avenue, Rm. W-1033, Seattle, WA 98104, or by phone at 206-296-1655.

Alternative Formats Available Upon Request

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EXECUTIVE SUMMARY

Overall, the audit finds that Transit is actively engaged and takes pride in fulfilling its stated mission: “Provide the best possible public transit services that get people on the bus and improve regional mobility and quality of life in King County.” We also found, however, the ways that Transit pursues this mission have contributed to higher costs – a situation that is exacerbated by the fact that in the past two years, Transit’s economic environment has resulted in dramatically reduced revenues, and in some areas, increased costs. In response, county decision-makers are reassessing Transit priorities and identifying opportunities for efficiencies. This audit contributes to this reassessment by identifying opportunities to increase Transit efficiency, generate revenues, and improve effectiveness.

**\$37 Million in Annual
Efficiencies, \$54
Million in Revenue
Options Identified**

Our performance audit of Transit, requested by the Metropolitan King County Council, examined six general areas: financial and capital planning including analysis of trolley replacement options and fare strategies; bus service development; bus operator and transit police staffing; Americans with Disabilities Act (ADA) paratransit; vehicle maintenance; and ridership data and customer communications during emergencies. This audit focuses on providing information that will result in cost savings and analyses that decision-makers can utilize when making policy decisions.

Through implementation of the recommendations in this report, we have been able to quantify potential annual savings in the range of \$37.2 million and opportunities to boost revenue by \$53.8 million per year. Added to this is a one-time cost savings of \$105 million. These potential savings are summarized in Exhibit A below. *This table should not be understood to be an amount that could be removed from Transit’s budget.* Achieving these

results may require trade-offs in Transit priorities but could be a better option than deeper service cuts. Some of these savings or revenues would require specific policy choices by decision-makers. Other savings or revenues could be incremental and take multiple years to realize depending on the approach taken by Transit to implement recommendations. Some of our recommendations were not quantified in terms of potential savings because there was not enough information to make a specific estimate. They are not included in this table, but would result in additional savings for Transit.

EXHIBIT A

Summary of Potential Annual Savings, Revenue Opportunities, and One-Time Savings or Available Funds From Audit Recommendations

Tools to Achieve Schedule Efficiency	Possible Annual Cost Savings	Opportunities for Increased Annual Revenue	One-Time Available Fund Balance
Revenue Fleet Replacement Fund Overfunding (Ch. 3)			\$105 million
Replace Trolley With Hybrids (Ch. 4)	\$8.7 million		
Fare Increases (Ch. 5)		Up to \$51 million	
Conduct Round Trip Cycle Time Analysis (Ch. 6)	\$12 to \$19 million		
Implement Advanced Blocking Techniques (Ch. 6)	\$0.7 million		
Implement Advanced Runcutting Techniques (Ch. 6)	\$3 million		
Reduce Access Services to ADA Requirements (Ch. 8)	\$1 million		
Increase Access Fares to ADA Levels (Ch. 8)		Up to \$2.8 million	
Meet Access Productivity Goal (Ch. 8)	\$2.8 million		
Access CAT Program Expansion (Ch. 8)	\$2 million		
TOTAL	\$30.2 to \$37.2 million	Up to \$53.8 million	\$105 million

Source: King County Auditor's Office

Summary of Executive Response

The County Executive provided a response to the 34 recommendations made in this report. The executive concurred with 31 of these recommendations, partially concurred with one recommendation, and did not concur with two recommendations. The response also included proposed implementation timelines. See appendices section for the complete text of the Executive Response.

Summary of Auditor's Comments

Auditor's comments to the executive response on the recommendations can be found in the appendices section. In summary, implementation of all the recommendations in this performance audit is important to ensure that Transit operates in the most cost-effective manner while balancing policy priorities. The executive's response to this audit acknowledges that several of the recommendations made by the auditors can result in significant operational efficiencies, service improvements, revenue enhancements, and other positive outcomes.

In two cases, the executive did not concur with audit recommendations and states that Transit is achieving or planning to achieve the same outcome in a different manner. After review of Transit's proposed alternatives, the auditors do not believe that these approaches meet the intent of our recommendations in solving the problems identified by the auditors. In one other case, Transit stated that an option that the auditors discuss may not be legal, but the division cannot provide us with case law citations to support their assertion.

Acknowledgement

Undergoing a performance audit can take staff time to collect data, communicate with auditors, and review documentation. In an audit of this breadth, Transit committed numerous hours to

working with the auditor's office and our consultants. We appreciate the time and effort expended by Transit management and staff; they were professional and responsive. We were encouraged that, in some cases, Transit began implementing resolutions to audit concerns quickly after they were identified.

1 INTRODUCTION

Transit Serves More Than 100 Million Riders per Year

Transit is a large and complex organization that provides many different programs and services to county residents. The King County Executive, King County Council, and the Regional Transit Committee all influence Transit policy. Other primary stakeholders include Transit customers, labor unions, and the public. Transit policy is also influenced by ballot measures, for example, Transit Now. Transit serves more than 100 million riders per year within a 2,134-square-mile area and maintains/operates a fleet of about 1,300 vehicles, including standard and articulated buses, electric trolleys, diesel buses, hybrid diesel-electric buses, and streetcars. Transit provides both regular bus service and paratransit van service for disabled riders and operates buses and light rail for Sound Transit.

Objectives

The entire Transit audit spanned multiple areas of work, including Transit's service practices, financial and capital planning, technology and information management, vehicle maintenance, operator and transit police staffing, and paratransit.¹ The objectives of each of the areas of the audit are shown in Exhibit B.

¹ Paratransit is a transit service for elderly and disabled riders that is required by the federal Americans with Disabilities Act (ADA).

EXHIBIT B
Table of Audit Objectives

Area of Audit Work	Chapter	Objectives
Financial Planning	2	Determine if Transit's financial plan and model are effective and serving their intended purposes.
Capital Planning	2	Determine if Transit effectively plans the capital budget, including planning for fleet replacement.
Trolley Replacement	2	Evaluate the costs and benefits of replacement alternatives for Transit's existing trolley fleet.
Fare Strategies	2	Evaluate the effectiveness of Transit's fare policy, fare policy goals, fare structure, and the downtown ride free area reimbursement formula.
Service Development	3	Determine if Transit's bus service is scheduled efficiently and effectively.
Operator and Transit Police Staffing	4	Determine the effectiveness of the methods Transit employs to determine and then allocate staffing resources for bus operators and Transit Police.
Paratransit	5	Evaluate Access's costs and productivity, current and potential cost containment strategies, and staffing efficiency and effectiveness.
Vehicle Maintenance	6	Evaluate Transit's vehicle maintenance management and practices.
Ridership Data	7	Determine if Transit is effectively utilizing its ridership data.
Emergency Communications	7	Determine how effectively Transit communicates with customers during emergencies and if their communication improvements are on schedule for winter 2009-2010.

Source: King County Auditor's Office

Methodology

To achieve the objectives noted above, the King County Auditor's Office competitively selected a team of independent consultants with expertise in transit management and operations noted in Exhibit B. The office and its consultants:

- Interviewed Transit leadership, management, and line staff in the following work groups:
 - General Manager's Office
 - Service Development
 - Transit Operations
 - Budget and Finance
 - Research and Management Information
 - Vehicle Maintenance

- Power and Facilities
- Design and Construction
- Information Technology
- Sales and Customer Service
- Paratransit/Rideshare Operations
- Transit Police Unit
- Interviewed Sheriff's Office management and staff
- Interviewed GIRO staff, the vendor of the bus scheduling software (HASTUS) and analyzed Transit data provided by GIRO
- Interviewed transit researchers at the University of Washington's Washington State Transportation Research Center (TRAC), various telecommunication/technology industry officials, and members of Transit's Transit Advisory Committee
- Observed Transit meetings and processes at bases and other Transit facilities
- Surveyed relevant industry literature and best practices
- Conducted peer reviews, including interviews of management and staff at peer transit entities
- Reviewed Transit documents, service contracts, and agreements
- Participated in a Transit Police ride along
- Performed analyses of Transit data from operating, personnel, and accounting systems, including but not limited to:
 - A copy of Transit's HASTUS database, system files, and historic information
 - Automatic Vehicle Location (AVL) data
 - Automatic Passenger Counter (APC) data
 - Transit's financial analysis model
 - Economic analyses of capital project alternatives
 - Fleet and vehicle maintenance data systems

- Capital project information systems
- Transit's diesel-hybrid cost model
- Maintenance Management Information System
- Annual performance reports for Vehicle Maintenance and Access
- Developed and/or utilized the following analytical tools:
 - Scheduling models using the HASTUS software for sample routes and bases
 - Lifecycle cost model comparing trolleys, hybrid diesel-electric, hydrogen battery, and fuel cell buses
 - Fare model
 - Operator staff cost model
 - Transit Police staffing model

**Scope of Work on Internal Controls and Data Reliability,
Government Auditing Standards**

We assessed internal controls relevant to the audit objectives. This included review of selected policies, guidelines for economic analysis, selected performance measures, strategic/comprehensive/business plans, service planning standards and processes, selected staff training, and selected contracts.

In many areas of this audit we relied on computer-generated data. We tested the reliability of the data using a variety of techniques depending on the data and our purposes. Data reliability testing techniques included evaluating Transit's actions to ensure data reliability, reviewing some system controls, increasing use of corroborating evidence, tracing to source or corroborating documentation, excluding questionable data from analyses, and/or scenario testing. We determined that the data used was sufficiently reliable for our intended purposes.

We conducted this audit in accordance with applicable Government Auditing Standards.

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2 NEED FOR IMPROVED PLANNING AND ANALYSIS

Improved Planning and Analysis Can Have Positive Fiscal Impacts

Chapter Summary

There are multiple opportunities for Transit to utilize planning and strategic approaches to problems to reduce costs and/or generate revenues. In addition, Transit collects a great deal of data, and in many cases, analyzes and uses it to make decisions. However, in many areas reviewed as part of this audit, Transit could expand and improve its utilization of data analysis to improve efficiency.

In order to resolve planning and analytical opportunities, we recommend many specific actions be taken in subsequent chapters of this report and which are detailed in individual Technical Reports A – F. These recommendations are intended to shift Transit’s organizational perspective more toward cost reduction and revenue enhancement by documenting and operationalizing an approach that includes systematic planning and effective data analysis.

Introduction

In his 2009 proposed budget, the County Executive announced that the county’s general fund faced the largest single-year deficit in its history, and a structural imbalance between the projected growth of revenues and expenditures. Transit is piloting biennial budgeting in King County. In its legally mandated mid-biennial review, Transit acknowledged that many of the assumptions it used in 2007 to prepare the 2008/2009 budget required significant revision, given the worsening economic environment the county – and country – were facing. Transit estimated that declining sales tax revenues, volatile diesel fuel prices, and other negative impacts of the economic downturn had lead to a

\$104 million gap in the current biennial budget, and based on sales tax revenue projections, a widening deficit to 2013.

The County Council requested this audit as part of the 2008 Auditor's Office work program. During the 2009 budget process, because of the emerging financial situation, the council directed that the audit of Transit be expanded and requested that results of the audit be provided prior to the 2010 budget process.

**There Are Trade-offs
Between Efficiency and
Other Transit Priorities
to Consider**

During our work, auditors observed Transit's commitment to service quality, high ridership, and regional mobility. Although there are many examples of how Transit focuses on efficient operations, we nevertheless found several opportunities for more emphasis on efficiency and/or revenue generation in the audited areas. The county's and Transit's current financial condition warrants making efficiency, cost reduction, and revenue enhancement higher priorities than they have been in the past. Again, because of the budget shortfalls, Transit and policy-makers may be balancing trade-offs between efficiency and other Transit priorities such as high ridership and service quality in order to avoid more extensive service cuts. Efficiency priorities should be documented and operationalized in a multifaceted approach that includes systematic planning and effective data analysis. Our audit includes recommendations to encourage this approach. Implementation of some of our recommendations will require decision-makers outside of Transit to make specific policy choices.

Our audit found many opportunities to implement cost-reduction and revenue-generating approaches. The two cross-cutting findings noted here are based on evidence gathered during our audit work taken as a whole.

Although Transit has engaged in a strategic planning process and utilizes its data for some analyses, there are multiple

opportunities for Transit to focus systematic planning approaches and effective data analysis in the reduction of costs and/or the generation of revenues. If Transit focused more of their planning and analysis on cost savings and revenue generation, it would help ensure that costs and revenues are key considerations as Transit evaluates its overall approach to meeting policy goals and priorities. In addition, by increasing this focus there is recognition of Transit's environment that can be used as a foundation to implement difficult, but needed, changes.

Gaps Exist in Transit's Strategic Planning

Transit Can Use a Strategic Approach to Planning to Create Cost Savings and Generate Revenues

We have identified many opportunities for Transit to implement even more effective planning, especially planning with more focus on efficiency and/or revenue generation. Although Transit is part of Department of Transportation's Business Plan, has a Comprehensive Plan, and has a Strategic Plan, these plans do not address all planning needs for the organization. This audit identified gaps in planning for those Transit operations that were subject to review in this audit. Transit could improve the strategic value of its approach by expanding planning efforts that include:

1. Fully understanding the problems they are working to solve;
2. Clearly specifying the outcomes they want to achieve; and
3. Identifying strategic, comprehensive approaches to achieving those outcomes.

One barrier that Transit sees in regard to planning is the amount of staff time and resources that it can devote to planning. Transit reports that staff cuts over the past few years have resulted in difficulty keeping up with the day-to-day workload and prevent a comprehensive approach to planning. Transit notes that they do not have a unified strategic business planning unit or structure. Transit also indicates a legitimate concern that, in this difficult budget cycle, funding for staff and other resources that would be

utilized to implement these efficiency-focused strategic approaches could be further reduced.

Because this audit is focused on cost savings, we made an effort to quantify the anticipated outcomes of our recommendations; however, when we recommend developing plans, goals, and measures it is often difficult to quantify the savings that could result. How much will be saved is dependent on the aggressiveness of Transit's implementation approach and the level of operationalization they achieve. In addition, some recommendations would involve council consideration and action.

To illustrate the opportunities to better utilize planning to create cost savings and generate revenues, during our audit analysis we found that:

- **Paratransit Productivity:** Transit does not have a strategic, comprehensive approach to investigating factors in productivity trends or identifying solutions to reach goal productivity levels. If Access had met its productivity goal in 2008, \$2.8 million would have been saved. *Chapter 8 describes productivity and other cost containment efforts in greater detail.*
- **Bus Service Efficiency:** Transit does not integrate efficiency metrics into planning processes that monitor operating cost efficiency over time. This limits their ability to monitor progress toward ensuring that resources are allocated to achieve lowest possible costs within the context of overall service delivery objectives. *Chapter 6 further describes Transit's use of efficiency metrics.*
- **Bus Service Scheduling Standards:** Transit does not have specific standards that establish a framework for the trade-offs between efficient operations and other scheduling objectives or that directs systematic application of Transit

data. If standards were in place, Transit staff would be increasingly able to make more consistent and effective choices to result in efficient bus service and would be accountable for the results. *Chapter 6 further describes service development standards.*

- **Fare Policy:** Transit's fare policies are not guided by goals that tie to other program goals and objectives. Depending on decisions of policy-makers, Transit could generate up to \$51 million per year in fare revenue. *Chapter 5 examines strategies and trade-offs related to fares.*
- **Facility Master Planning:** Transit has not yet completed Facility Master Planning that would examine Transit's current and projected facility needs, and the capacity and condition of Transit's existing facilities. Doing this would help Transit to determine the best and most economic facility investments in the future. *Chapter 3 further discusses facility planning.*

RECOMMENDATION S1

Transit should address opportunities to enhance and expand the use of planning across the organization, especially those practices which would lead to increased efficiency and revenue generation. This planning should utilize a strategic approach that includes clear problem identification, goals for outcomes, and methods to measure progress.

Transit Can Reduce Costs and Generate Revenues by Systematically Applying Effective Data Analysis

Transit collects a great deal of data, and in many cases, it is analyzed and used to make decisions. However, in many areas reviewed as part of this audit, Transit could expand and improve its utilization of data analysis to improve efficiency. When making decisions about significant amounts of taxpayer funds, using professional judgment in lieu of utilizing data is insufficient.

In 2005, our office requested that Transit provide examples of the analysis supporting several major expenditures. In lieu of providing written policies and guidelines and the analyses based on those guidelines, Transit provided narrative descriptions of its decisions. Transit acknowledged that it did not systematically evaluate or quantify the cost and benefits related to its important and/or costly decisions. Although there has been some progress since that time, this continues to be a significant theme in the findings of this audit. Using data analysis more consistently, systematically, and effectively would help Transit to be certain that the decisions that they are making or recommending to policy-makers are the most cost effective.

Decisions Should Be Based on Effective Data Analysis

As with effective planning, discussed in the previous section, Transit cites a lack of staff time and resources and concerns about further budget reductions as obstacles to implementing systematic data analysis. In addition, Transit identifies many areas that we believe are appropriate for analysis as policy decisions, and opts not to analyze the data but instead, to leave the question for policy-makers. In contrast to this approach, effective policy decisions should be based on accurate and systematic data analysis. The specific benefits of analyzing data vary depending on the data and the goals of the analysis. The following examples are difficult to quantify, but in some parts of the audit we were able to analyze data ourselves to estimate cost savings that might result from implementing recommendations.

To illustrate the opportunities to improve and better utilize data analysis to create cost savings and generate revenues, during our review, we found that:

- **Bus Service Development:** Transit does not currently utilize many of the high-level analytical processes provided by their scheduling software. Employing these tools would enhance productivity, and \$15.7 million to \$22.9 million could be saved

each year. *Chapter 6 discusses opportunities for service development analysis.*

- **Vehicle Replacement:** Transit does not base its fleet replacement decisions on economic replacement analysis. Transit spends hundreds of millions of dollars maintaining and replacing vehicles so even small replacement efficiencies could result in significant savings. *Chapter 3 shows current replacement criteria and discusses economic replacement analysis.*
- **Economic Analysis for Capital Decisions:** Transit's analysis for capital decisions does not accurately apply requisite principles of economic analysis. Improving accuracy of their analysis would allow Transit to make more cost-effective decisions. *Chapter 3 provides high-level detail of Transit's economic analysis.*
- **Downtown Ride Free Area:** Transit was unable to document or support the formula it uses as the basis for payments by the City of Seattle in support of the downtown ride free area. Ensuring a clear approach and rationale for the reimbursement methodology would allow negotiation of appropriate compensation for the downtown ride free area. *Chapter 5 details this issue more fully.*
- **Operator Staffing Data Analysis:** Transit lacks information on patterns of staff utilization, systemwide and by base. Gathering and analyzing this data would assist Transit to determine the most economic staffing levels for bus operators. *Chapter 7 discusses operator staff utilization.*
- **Transit Police Staffing Analysis:** Transit's method for determining Metro Transit Police (MTP) staffing levels is imprecise. Using more exact methods of staff resource planning would help MTP management more effectively plan its staff coverage, estimate costs, and choose the most

efficient staffing options. *Chapter 7 evaluates MTP staffing analysis techniques.*

- **Vehicle Maintenance:** Transit currently does not track and monitor unplanned vehicle maintenance. Doing so would enable Transit to more carefully plan staffing levels and reduce costs. *Chapter 9 evaluates planned and unplanned vehicle maintenance.*

RECOMMENDATION S2

Transit should ensure that systematic, effective data analysis drives organizational choices. When decision-makers are determining Transit policy, Transit should provide thorough data analysis to inform deliberations.

3 IMPROVE FINANCIAL AND CAPITAL PLANNING

Improvements in Financial Policies, Plan and Model; and Vehicle Replacement Analyses Can Lead to Savings and Greater Transparency

Chapter Summary

While Transit employs some core elements of financial and capital planning, there are opportunities to better manage costs and to enhance their use of analysis to produce the most cost-effective decisions. The Regional Transit Committee and King County Council will also play a role in implementation of the recommendations included in this report as some of the recommendations involve changes to financial policies. Other recommendations, for example, using economic replacement analysis to determine when vehicles should be replaced, can be implemented by Transit itself. There are recommendations in Chapter 2 that are repeated from past audits because they have not been fully implemented.

This chapter is a summary of a more detailed report. For more detailed explanations of concepts, findings and recommendations, please review *Technical Report A: Financial and Capital Planning*. The technical report also more fully explains calculations and the sources of numbers.

Transit Employs Core Elements of Financial and Capital Planning, but Opportunities Exist

Summary of Findings

Transit's financial planning and its financial model are thorough and prudent. However, its financial model is overly complex and lacks transparency, making it difficult for outsiders to understand or test the assumptions upon which Transit's financial plan is based. We also found that some of Transit's financial policies are outdated. Transit's financial plan holds more money in reserve than is needed in the Revenue Fleet Replacement Fund; although it is a one-time savings, \$105 million could be transferred out of that fund and used for other purposes.

Transit has made some progress in implementing earlier audit recommendations to support its capital decision-making with standard economic analysis techniques; however, there is still room for improvement. For example, Transit does not base its fleet replacement decisions on economic replacement analysis. Given that Transit spends almost \$200 million per year to purchase and maintain its bus fleets, even a small reduction in these costs could amount to millions of savings per year.

Summary of Recommendations

To resolve the issues identified in the analysis of Transit's financial and capital planning, Transit should undertake a number of activities and planning processes. In some cases, we recommend that policy choices be made that involve the review and/or approval of the Regional Transit Committee and/or the King County Council. These are noted in the text of the recommendation. Transit should:

- Create an updated version of the financial model.
- Propose updated financial policies to the Regional Transit Committee and council.
- Improve the accuracy of projections for capital expenditures and capital grant revenue.
- Develop a plan for reducing the size of the Revenue Fleet Replacement Fund balance.
- Address technical issues with its economic analysis model.
- Use economic replacement analysis to inform its vehicle replacement decisions.
- Complete a review of Fleet Administration's operations and maintenance data if they wish to utilize Fleet Administration's replacement criteria.
- Complete its comprehensive Asset Management Guidebook.
- Implement a Facilities Condition Index and systemwide targets for condition ratings.

- Ensure that all elements of facility master planning are incorporated as part of its 2010 update to the Comprehensive Plan.

A More Robust and Transparent Financial Model Needed by Transit

A financial model summarizes recent and forecasted revenues and expenditures. It is a key document for analyzing Transit's financial condition and informing crucial decisions about future service enhancements and capital improvements. In general, we found Transit's financial model to be comprehensive, thorough, and conservative. However, the model lacks documentation for some of its forecasts. For example, forecasts performed outside of Transit's finance group are not documented. In addition, since many assumptions are hard-coded and not calculated within the model, the model is not set up to evaluate the impact of individual changes. The model's complexity, lack of documentation, and the frequency of hard-coded variables (numbers without the formulas from which they were derived) make it difficult to use.

RECOMMENDATION A1

Transit should create an updated version of the financial model that facilitates sensitivity analysis and has complete documentation and explicitly identified assumptions. This model should be made available to external parties such as the Office of Management and Budget and council committee staff.

Updated Financial Policies Needed

Transit has adopted Transit Program Financial Policies which are annually submitted to the Regional Transit Committee for review and approval. The policies cover broad areas of fund structure

and reserves, resource allocation, capital funding and debt, fares and costs, and financial policies and development.

Financial Policies Do Not Reflect Current Fiscal Environment

We found, however, that some financial policies do not reflect the current operating environment. For example, the revenue allocation policy assumed a Motor Vehicle Excise Tax that is no longer in place. The combined effect of these changes has resulted in a higher proportion of Transit's revenue dedicated to the capital program than was the case when the policy for distributing sales tax revenue between operations and capital was set. While previously, operating revenues were used to support the capital program, now capital revenues support the operating program. In light of the above and additional findings (discussed below) relating to the size of the Revenue Fleet Replacement Fund balance, a change in the allocation of revenue between the capital and operating programs is warranted.

RECOMMENDATION A2

Transit should propose updated financial policies particularly those related to sales tax distribution and cost growth for consideration by the Regional Transit Committee and the King County Council.

Capital Expenditure and Grant Revenue Projections Have Not Been Historically Accurate

Transit has consistently overestimated capital expenditures and underestimated capital grant revenue. We analyzed six years of Transit financial plans (2003-2008) to assess the accuracy of each year's revenue and expenditure projections for the subsequent year. Over this period, Transit's forecasts of overall revenues and operating expenditures for the following year have been good. However, this analysis yielded two areas of particular

concern: Capital expenditures were overestimated in five of the six years evaluated; and, over six years, Transit forecasted receiving 17 percent (or \$75 million) more grants than it received.

The preceding paragraph discusses how Transit's *previous* projections of capital expenditures and capital grant revenue have overstated the amount of resources needed for the capital program due to a combination of overestimating capital expenditures and underestimating capital grant revenue. Based on our review of the projections in Transit's *current* financial plan, we question whether the current financial plan may also overstate the amount of resources needed for the capital program. Projected grant revenue in the future is significantly less than the amount of grant revenue currently being received.

RECOMMENDATION A3

Transit should revise its assumptions to improve the accuracy of projections for capital expenditures and capital grant revenue.

**Revenue Fleet Replacement Fund Overfunded by
\$105 Million**

The Revenue Fleet Replacement Fund (RFRF) provides a reserve for projected fleet expansion and for replacing old fleet vehicles. Based on vehicle acquisition schedules and projected costs, it identifies an annual amount of money that should be set aside in anticipation of future fleet acquisition expenditures. In almost every year, the amount of revenue dedicated to the RFRF (sales tax and preventive maintenance grant) is more than sufficient to cover that year's fleet acquisition expense. Between 2009 and 2020, excepting two years, each year's revenue to the RFRF exceeds what is needed to cover that year's fleet replacement expense.

\$105 Million Could Be Used From Revenue Fleet Replacement Fund While Still Funding All Planned Fleet Replacements

The size of the current reserve reflects Transit's old financial structure in which operating revenue had to support capital expenditures. Given the current financial structure in which dedicated annual capital revenues provide an excess of funds for fleet replacement, there is currently no need to maintain such a large balance in the RFRF. Using Transit's financial model, we calculated that in addition to the amount of transfers out of the fund balance projected by Transit in the financial plan, another \$105 million could be transferred out of the RFRF while still maintaining sufficient fund balance to fund all fleet replacements identified in the financial plan. Also, because spending down fund balance amounts to a one-time source of revenue, we caution against using the entire amount in one year if these funds are to be used to support ongoing operating expenditures because this source of revenue will not be available again once it is spent. It would be more prudent to use these funds more gradually.

RECOMMENDATION A4

Transit should develop a plan for reducing the size of the Revenue Fleet Replacement Fund balance and submit the plan for council approval.

Progress Made in Economic Analysis but Further Improvement Is Needed

Limitations in Transit's Approach to Economic Analysis Hinder Decision-Making

Economic analysis refers to the processes used to compare the benefits and costs of potential project alternatives based on standardized economic assumptions within an appropriate analytical framework.

In our 2005 audit, we found that Transit lacked guidelines for economic analysis and was inconsistent in identifying, quantifying, and analyzing the cost impacts of alternatives for major capital investments. We concluded that if Transit provided

the council with its analysis of a thorough array of alternatives, it could enrich the council's deliberations and support its decision-making process. We recommended that Transit develop and apply guidelines and models for economic analysis. Transit finalized their guidelines as well as an economic analysis model in August 2007.

For this audit, we evaluated three case studies of Transit economic analysis to test Transit's application of its new guidelines. We found that Transit has made progress in implementing previous audit recommendation related to economic analysis, but technical issues with their use of economic analysis remain.

RECOMMENDATION A5

Transit should address technical issues with its economic analysis model and provide it to the auditor's office to confirm its accuracy.

Transit Spends \$96 Million Annually on Buying Vehicles and \$94 Million Annually on Maintenance

Transit's Revenue Fleet Replacement Should Be Based on Economic Replacement Analysis

Transit does not conduct economic replacement analysis to identify the economic replacement point for its revenue vehicles, (this includes buses and Access, VanPool, and DART vans), and so it is likely that the cost of owning and operating its revenue vehicle fleet is higher than necessary. Exhibit C shows the criteria Transit uses when determining when to replace its fleets.

EXHIBIT C			
Replacement Criteria for Transit Fleets			
Fleet Type	Total Vehicles	Replacement Criteria	Criteria Basis
Revenue Fleet, buses, vans, and trolleys	1,336	Baseline of 7 years for vans, 12 years for buses, and 15 years for trolleys	FTA funding guidelines Ad hoc analysis of extending timeframe
Non-Revenue Fleet, light trucks, police vehicles, and vans	448	4 – 10 years	King County Fleet Administration criteria
Access Fleet, small buses, and vans	367	8 – 10 years	Professional judgment
Vanpool, vans	1,478	7 years	Professional judgment
DART Fleet, buses, and vans	50	N/A. 5-year service contract covers both provision and operation of new vehicles.	Contract length based on professional judgment
Total Fleet:	3,679		

SOURCE: King County Auditor's Office

The Cost of Owning and Maintaining Transit's Buses Is Likely Higher than Necessary

Each major category of vehicle has its own unique lifecycle costs, so in order to ensure that the total cost of owning and operating a vehicle is minimized, the replacement criteria for each category of vehicles should be based on a separate economic replacement analysis for that vehicle category. Given that Transit spends nearly \$200 million a year to acquire and maintain buses alone, even a small reduction in these costs resulting from optimizing the vehicle replacement decision could save millions of dollars per year.

RECOMMENDATION A6

Transit should create economic replacement analysis models to inform its vehicle replacement decisions starting with a model for the Revenue Fleet.

**Transit Should Evaluate
Model for Replacement
of Non-Revenue
Vehicles**

**Non-Revenue Fleet Replacement Currently Uses Fleet
Administration Data**

As part of our 2006 County Vehicle Replacement performance audit, we looked at the non-revenue vehicle fleet. We found that in lieu of developing a lifecycle cost model, Transit adopted its replacement criteria from Fleet Administration. Both its unique uses and differences in the way Transit employees maintain their fleet could lead to operations and maintenance costs that are different from those experienced by Fleet Administration vehicles. Therefore, it is unclear whether the replacement criteria used by Fleet Administration based on the cost patterns of Fleet Administration vehicles is valid for Transit vehicles. Transit received Fleet Administration's data in June 2009 and has not yet finished its analysis, but reports that analysis will be complete by late August 2009.

RECOMMENDATION A7

If Transit wishes to continue to use Fleet Administration's replacement criteria for its Non-Revenue Vehicle (NRV) Fleet, it should complete its review of Fleet Administration's operations and maintenance data. If Transit chooses not to use Fleet Administration's replacement criteria, economic replacement analysis should be used for non-revenue vehicles. Note: This recommendation is comparable to a 2006 County Vehicle Replacement performance audit recommendation.

Transit's Asset Management Plan Is Incomplete

In 2003, the Washington State Legislature required all transit agencies within the state to submit an asset management plan to the Washington State Department of Transportation (WSDOT). Our 2005 Transit Capital Planning and Management performance audit recommended that Transit consider using the state-mandated Asset Management Plan to document and

**Progress Made Toward
Asset Management
Plan; Updates Needed**

communicate its asset management approach both internally and externally. Our 2007 follow-up recommendation was for Transit to identify a new timeline for implementing a comprehensive asset management guidebook that satisfies both state and federal mandates. Transit developed Asset Management Guidebook in July 2008. It is not the comprehensive guidebook on asset management envisioned in Transit's 2007 response. According to Transit, the division has not worked on the document in over a year.

Our original recommendation in 2005 was intended to help Transit assimilate and communicate its approach to asset management, using an existing process (the state requirements). In order to implement the recommendation, Transit's guidebook needs to be comprehensive, including the elements of the state requirements, as well as other germane asset management efforts within the division. However, Transit has since created economic analysis guidelines and has made other changes that require the document to be updated to fully reflect Transit's current approach.

RECOMMENDATION A8

In 2005 we recommended that Transit complete its comprehensive Asset Management Guidebook, including all asset management efforts currently underway within the division. We continue to recommend that the comprehensive Asset Management Guidebook be completed.

Transit Should Implement a Facilities Condition Index

The Transit Asset Management Program (TAMP) is a program designed to preserve and replace Transit's facilities and equipment. Transit's TAMP budget is over \$15 million. The Transit Facilities Condition Report (TFCR) supports the TAMP by identifying the capital projects necessary to preserve Transit assets in the near term. TAMP and the TFCR embody many elements of strong asset management and facility planning. Industry best practices include compiling a comprehensive inventory, regularly performing condition assessments and updating the inventory with such information, and articulating program goals and objectives.

Targets and Tracking Could Improve Facility Conditions and Progress Toward Facility Condition Goals

While Transit tracks and maintains information on individual facility components, it does not set targets for or track systemwide condition. A Facilities Condition Index (FCI) can be used to track and monitor facility condition relative to targets.² Programwide facility condition ratings can be summarized to provide the percentage of buildings in excellent, good, fair, or poor condition, and targets can be set for how much of the system should be maintained in particular conditions. If, for example, a goal is to maintain 75 percent or more of an agency's facilities in good condition, the FCI can show progress toward that goal.

RECOMMENDATION A9

Transit should implement a Facilities Condition Index and systemwide targets for condition ratings for the Transit Facilities Condition Report.

² The FCI is expressed as the ratio of required repairs to the replacement value of the building. One example of the use of FCI is the Washington State Community College System, which provides a biennial report on the condition of its facilities systemwide.

Transit Should Implement All Elements of Facility Master Planning**Plan Needed to Determine Best Facility Investments**

Transit's capital projects are still not guided by a comprehensive facility master plan. Facility master planning is the practice of examining the current and projected facility needs of an organization and the capacity and condition of existing facilities in order to determine the best facility investments in the future. A facility master plan articulates the relationship between the department's strategic goals and its physical plant. A facility master plan also helps to clarify facility needs and priorities for CIP investments by providing comprehensive information on current facilities, their condition, and building standards to which the department adheres. Finally, a facility master plan identifies a rough level of investment needed to satisfy building needs, compared to current funding levels.

Transit reports that they intend to update the Transit Comprehensive Plan to establish the planning framework, including mission, goals, objectives, and policies to guide the Transit System. In addition, Transit plans to update the strategic plan to establish operating and capital program strategies sufficiently comprehensive to address service and capital master plan elements.

RECOMMENDATION A10

In its 2010 update to the Transit Comprehensive Plan, Transit should ensure that it fully incorporates all elements of facility master planning. This is comparable to a recommendation made in 2005.

4 OPTIONS FOR REPLACING TROLLEYS

Transit Scheduled to Replace Trolleys in 2014

Chapter Summary

Electric trolley buses (trolleys) are used on some routes within the City of Seattle as an alternative to diesel buses. Because trolleys are quieter and do not generate tailpipe emissions, they have environmental advantages in densely populated urban areas; however, trolleys are expensive to purchase and operate in comparison to other replacement options. Transit's trolley fleet is aging and is scheduled to be replaced in 2014. This chapter evaluates whether there are viable alternative technologies to the trolleys that provide similar benefits at a comparable or lower cost than the trolleys that could be considered during the replacement process.

Hybrids, Hydrogen Fuel Cell, and All-Battery Buses May Be Alternatives to Trolleys

Of the alternative technologies considered; hybrid diesel/electric buses (hybrids), battery powered buses, and hydrogen fuel cell powered buses; only hybrids are an economically viable alternative to the trolleys. Battery and fuel cell powered bus technologies are not sufficiently advanced to be a viable alternative to the trolleys for the 2014 replacement timeline. Replacing the trolleys with hybrids could save approximately \$8.7 million in vehicle purchasing and maintenance costs and operational costs. Replacing the trolleys with hybrids would result in some added tailpipe emissions and noise in the neighborhoods currently being served by the trolleys.

This chapter is a summary of a more detailed report. For more detailed explanations of concepts, findings and recommendations, please review Chapter 4 in *Technical Report A: Financial and Capital Planning*. The technical report also more fully explains calculations and the sources of numbers.

Summary of Findings

Fuel cell and battery-powered buses are not viable candidates for replacing the trolley fleet. However, Transit could save \$8.7 million per year by replacing the trolley buses with hybrid diesel/electric buses. The trade-offs for this potential savings would include increased noise and diesel exhaust emissions in the neighborhoods currently being served by the trolleys.

Summary of Recommendations

Transit should consider all relevant factors, including costs, when evaluating an appropriate fleet replacement for the trolley buses. This information will also need to be presented to council.

Hybrids Would Cost Less, but There Are Environmental and Social Factors to Consider

**Trolleys Would Cost
\$8.7 Million per Year
More Than Hybrid
Buses**

Four technologies were evaluated for this report: trolleys, hybrids, hydrogen fuel cell buses, and all-battery buses. No other alternate fuels technologies were identified in the Federal Transit Administration's current *Multi-Year Research Program Plan*. At this time hybrid buses are the most viable alternative to trolleys due to availability and reliability of the technology. Fuel cell buses still have technical and commercial challenges that make it unlikely that they will be a viable alternative by 2014, when Transit's trolleys are scheduled to be replaced. While the all-battery bus may be capable of supplementing an electric trolley bus fleet, all-battery buses also have technical, cost, and range limitations that make it an unlikely viable alternative to trolleys in 2014.

Lifecycle cost analysis evaluates both the ownership and operating costs of a vehicle through its entire life and takes into account the time value of money by discounting future costs (and cost savings, if applicable) to their present value. It is a standard financial technique for comparing options with different

procurement costs, operating and maintenance costs, and useful lives. The lifecycle cost analysis determined the annual per-bus costs for each of the four technologies:

Replacement Alternative	Annual per-bus Cost	Estimated Useful Life
Hybrid	\$141,878	16 years
Trolley	\$177,318	18 years
All-Battery	\$204,234	14 years
Fuel Cell	\$397,154	14 years

Based on these results, the annual lifecycle cost per vehicle is lowest for the hybrid, followed by the trolley, the all-battery bus and last, the hydrogen fuel cell bus. Extrapolating the annual cost to a fleet of 159 buses, replacing the trolley fleet with hybrids would save \$5.6 million per year in comparison to replacing the current trolley fleet with new trolleys. Replacing the trolley fleet with either fuel cell or battery-powered buses would be substantially more expensive than the current trolley fleet, while also having the operational limitations noted above.

Hybrids Offer \$3.1 Million per Year in Scheduling Efficiencies

In addition to the savings noted above, there are other cost savings that would be likely if the trolley fleet were replaced with hybrids. Analysis in *Technical Report B: Service Development* noted that the most inefficiently scheduled routes were the trolley routes. Characteristics unique to trolleys make these routes difficult to schedule efficiently; for example, trolleys can only travel in limited areas that are under overhead wire, one trolley cannot pass another, and detours to other streets are impossible without wiring. Replacing the trolley buses with hybrids would remove the scheduling constraints inherent in buses operating on fixed overhead wires, and improve scheduling efficiency. The audit team estimates that if the trolleys were replaced with hybrids, \$3.1 million per year could be saved by improved

scheduling efficiency. Adding the \$3.1 million of annual savings from improved scheduling efficiency to the \$5.6 million annual savings from lower owning and operating costs, we estimate that replacing the trolley fleet with hybrids would save \$8.7 million per year.

The availability of federal funding for trolley bus procurements is another consideration. The standard federal match for bus purchases is 80 percent using Section 5307 or fixed guideway funds. The federal match increases to 83 percent for transit agencies purchasing 'clean' vehicles, such as electric trolley buses. In addition, a separate federal program, the Clean Fuels Program, will fund most of the cost for vehicles that use clean fuels. Electric trolleys also qualify for this program.

There Are Social and Environmental Trade-Offs Between Hybrids and Trolleys

Many Other Factors Besides Cost Need to Be Considered in Replacing Trolleys

The lifecycle cost analysis did not attempt to place a value on the social or environmental impacts of the trolley replacement options. Some of the considerations might include the reduced noise of the trolleys or the improved visual impact of removing overhead wires. In addition, there may be some benefit of reduced carbon emissions resulting from the use of trolleys. Given this region's substantial use of hydroelectric power in the generation of electricity, the reductions in carbon emissions from using trolleys compared to hybrid buses is likely to be substantial. However, hydroelectric plants may cause their own environmental problems (e.g., damage to fish runs).

RECOMMENDATION A11

Transit and the council should consider all relevant factors, including costs, when determining an appropriate fleet replacement for the trolley buses.

5 FARE POLICIES AND STRATEGIES FOR GENERATING REVENUE

Chapter Summary

This chapter addresses four issues related to Transit fares:

- Transit's use of goals in guiding fare decisions,
- The impact of fare decisions on revenue and ridership,
- Seattle's ride free area, and
- Discounted fares.

There Are Opportunities to Increase Revenue and Achieve Other Fare Objectives

Multiple opportunities exist to increase revenues and achieve other fare objectives through changes to Transit's fare policies. However, Transit has not defined goals for its fare policies, making it difficult to tie fare changes to Transit's overall goals and objectives. As a result, there are gaps between Transit's fare policy and its underlying fare structure and prices. These gaps could be addressed with fare policy goals relating to optimizing market-based pricing strategies, developing partnerships, generating revenue, and leveraging smart card capabilities. Fare policies related to Access paratransit are discussed in Chapter 8 of this report.

Transit can neither fully explain nor provide backup documentation for operating cost savings that offset the fare revenues in the calculation of annual charges to the City of Seattle for the city's ride free area. We also found that in comparison to peers, Transit's discounted fares for seniors, persons with disabilities, and youth are unusually low. Finally, Transit has made changes in its fare structure to encourage the use of the ORCA regional smart card program and is considering other changes.

For more detailed explanations of concepts, findings, and recommendations, please review Chapter 5 in *Technical Report A: Financial and Capital Planning*. The technical report also more fully explains calculations and the sources of numbers.

Summary of Findings

Transit's fare policies are not guided by goals that are tied to organizationwide strategy. In addition, Transit was unable to fully document or provide support for the formula it uses as the basis for payments by the City of Seattle in support of the downtown ride free area. Finally, there are a variety of options for raising revenue by increasing fares or making strategic fare policy decisions.

Summary of Recommendations

We recommend that Transit develop and propose fare policy goals to the Regional Transit Committee and council as part of the update of the strategic plan. The goals should be the basis for making fare policy decisions. The fare policy goals should target policies that are clearly tied to Transit's strategic plan and are representative of Transit's agencywide goals and objectives. Transit should also define and monitor a target for a farebox recovery ratio that is calculated with only bus fares and bus fare related revenues divided by only bus operating expenses. Fare policy goals should specifically consider the need to generate revenue. Finally, as part of developing fare policy goals, Transit should reintroduce discounted fares, considering making discounts more in line with peers and pegged to the base fares by percentage. In addition, we recommend that Transit update, fully document, and consider revising the formula used to assess the City of Seattle's payment for the Downtown Seattle Ride Free Area.

Fare Policy Goals Needed

A transit agency's fare policy goals establish the principles that guide the agency's strategy for its fare policies and underlie the agency's fare structure and pricing decisions. These fare policy goals represent one way of pursuing the agency's overall goals. Best practices in the transit industry suggest that agencies' fare policies and goals should be linked to their overall organizational goals and objectives. Fare structure is a broad term that includes the fare prices, fare products, and fare media offered by a transit agency and the relationships among them.

**Fare Policy Decisions
Would Benefit From
Greater Linkage to
Division Goals and
Objectives**

Transit does not have adopted goals to guide fare policy decisions. These goals would steer the development of fare recommendations presented to policy-makers and link fare decisions to Transit's overall business strategy. In discussions of fare policies, such as Transit's February 2009 report to the council on transit fare policies and discounted fares, Transit has reviewed adopted fare policies and related them to commonly used fare policy goals, in part to explain how fare policy goals can influence fare decisions. Yet those goals were only illustrative and not adopted policy goals.

Since 1998 Transit's fare structure has been changed four times, a new regional fare collection system (ORCA) has been implemented, land use and travel patterns have shifted, and new transit modes are or will soon be operating in the region (light rail, commuter rail, RapidRide). In addition, both the comprehensive plan and the strategic plan were adopted in the last two years. All of these factors suggest the need for fare policy goals to define a predictable strategy and guidance for fare policy decisions.

**RECOMMENDATION
A12a**

Transit should develop and propose fare policy goals to the Regional Transit Committee and King County Council that are clearly tied to Transit's strategic plan and are representative of Transit's agencywide goals and objectives. These goals should be used as a basis for making fare policy decisions.

**Transit's Calculation
Showing Operating
Costs Recovered at the
Farebox Includes Non-
Fare Revenue**

**Transit Should Define and Monitor a Target Farebox
Recovery Ratio**

Transit's operating revenue to operating expense (OR/OE) calculation does not clearly show how much of the cost of operations are recovered by fares. Farebox recovery ratios and OR/OE ratios are often used interchangeably, but have important differences. Farebox recovery is the proportion of the cost of operating the bus service that is "recovered" through bus fares. In some cases, fares are "paid" not just at the farebox, but via fees paid in exchange for operating a specific route or service or by someone other than the rider (e.g., an employer or university) and are not typically included in the farebox recovery calculation but may make sense to include. OR/OE is similar, but includes revenues that are not related to fare payment, such as advertising. It is also important to understand which transit services are included in the ratio. Many transit entities operate rail, ferry, paratransit, and vanpool as well as bus service, and including these in their ratios can make the ratios not directly comparable to one another across transit entities. In this discussion, we address both the OR/OE and farebox recovery approaches, and we are looking at bus service only and not including other services operated by Transit, such as vanpool and paratransit.

Transit's financial policies, comprehensive plan and strategic plan currently specify the target for the OR/OE of at least 25 percent. Fares and fare-related revenue generate 93 percent

of operating revenue, and miscellaneous revenue (primarily advertising) generates the other seven percent. Because the OR/OE ratio includes non-fare related revenue, the OR/OE ratio is higher than the farebox recovery ratio. For example, in 2006 Transit's OR/OE ratio was 21.8 percent while its farebox recovery ratio was 19.6 percent. In the same year, the average bus-only farebox recovery for transit systems nationwide was 28 percent.

Over the last five years, Transit's OR/OE ratio has not exceeded 24.6 percent and the amended farebox recovery ratio that we recommend has not exceeded 22.9 percent, as shown in Exhibit D. Exhibit D also shows how the OR/OE ratio that Transit uses differs from the farebox recovery ratio that we recommend.

EXHIBIT D

Operating Revenue/Operating Expense and the Recommended³ Farebox Recovery Ratios

	2004 Actuals	2005 Actuals	2006 Actuals	2007 Actuals	2008 Actuals
Transit's Current OR/OE Ratio	22.7%	22.5%	21.8%	21.5%	24.6%
Recommended Farebox Recovery Ratio	21.5%	21.0%	20.0%	19.5%	22.9%

SOURCE: Modified from Public Transportation Fund Cash Flow, July 2009.

RECOMMENDATION

A12b

As part of adopting fare policy goals, Transit should define and monitor a target farebox recovery ratio. This ratio should include only bus fares and bus fare-related revenues divided by only bus operating expenses.

³ Recommended ratio includes fare revenue + fare-related revenue (i.e., Seattle Ride Free Area payment, School Service fee, UPass Service, Home Free Guarantee, Husky Stadium Supplemental Service, Seahawks Service, Mariner Service). It excludes advertising and miscellaneous revenue.

There Are Opportunities to Utilize Fare Policy to Generate Additional Revenues

Fares are a flexible tool to generate revenue for Transit that may assist in avoiding or lessening service cuts. We evaluated six distinct fare policy options designed to increase fare revenue. They are shown here as illustrations of opportunities for Transit and policy-makers to consider as they weigh revenue options and examine fare policies. The options shown in Exhibit E below could result in millions of dollars annually in additional revenues, although each would impact ridership.⁴

EXHIBIT E Policy Options to Increase Fare Revenue

Opportunity to Increase Fare Revenue	Annual Estimate of Revenue Generated	Potential Reduction in Ridership
Increase the PugetPass/ORCA monthly pass breakeven point to 40 trips. ⁵ The current Regional Fare agreement provides that riders would need to board 36 times in a month to breakeven if they were paying cash fare for each boarding.	\$6.6 million	0.3%
Increase the base and peak fares another \$0.25 (beyond the \$0.25 planned in 2010).	\$10.8 million	1.1%
Eliminate fare zones and increase the corresponding base and peak fares by \$0.25 (beyond the \$0.25 planned in 2010).	\$7.4 million	1%
Eliminate discounts for riding during off-peak times, while retaining the two-zone fare structure.	\$6.2 million	1.1%
Eliminate free transfer tickets while retaining the rest of the peak/off-peak and zoned fare structure.	\$16.5 million	3.8%
Eliminate free transfer tickets and introduce the option of purchasing a day pass (priced at 3.0 times the base fare) while retaining the peak/off-peak and zoned fare structure.	\$9.3 million	2.3%

SOURCE: King County Auditor's Office

These scenarios are accurate individually, but if more than one were implemented the revenue generation and ridership change

⁴ When fares change the number of people willing to pay the new fare changes as well. Typically, when fares increase fewer riders are willing to pay the fare. This phenomenon is called "elasticity" and must be considered when evaluating fare changes.

⁵ Changing PugetPass breakeven points would require agreement from all participating ORCA entities.

values would change. Combining multiple fare policy changes together results in an estimated \$64.3 million in fare revenue in 2010, with a ridership loss of 10.1 percent. Using the American Public Transportation Association's (APTA) elasticity rate instead of Transit's, \$51.0 million would be generated with a ridership loss of 15.6 percent. For more details on this analysis see Chapter 5 of *Technical Report A: Financial and Capital Planning*.

**RECOMMENDATION
A12c**

Transit and policy-makers should consider further utilizing fare policy changes to generate additional revenues to assist in funding Transit operations.

**Transit Exceeds Federal
and Policy
Requirements for Fare
Discounts**

**Transit's Senior, Disabled, and Youth Fare Discounts Are
More Generous than Peers**

The Federal Transit Administration (FTA) requires its grantees to allow seniors, persons with disabilities, and Medicare cardholders to ride fixed route services during the off-peak hours for a fare not to exceed 50 percent of the base fare charged full fare riders during the peak hours. Under the adopted fare structure, Transit's senior/disabled and youth discounts exceed this minimum for both peak and off-peak travel. Almost universally, Transit's regional and national peers do not offer fares discounted as much for seniors, disabled persons, and youth.

Transit's current fare structure exceeds the minimum discounts specified by the FTA and in Transit's own policies: discounts exceed 50 percent, and they are offered 24 hours per day/seven days per week instead of being limited to off-peak periods. They also extend to pass prices and cash fares. Transit prices other fares in relation to cash fares, but that practice does not extend to reduced fares beyond a Transit-only senior/disabled pass.

Transit has recommended this policy change in the past. Because Transit's reduced fares are set at flat rates that apply across all services and times of day, fares are easier to understand and enforce, but discounts are even higher for zoned, peak period fares.

Transit's reduced fare policies generate ridership, but at a cost. If Transit were to bring discounted fares more in line with federal requirements and its peers there could be additional revenue generated, with some corresponding reduction in ridership, as illustrated below in Exhibit F.

EXHIBIT F		
Potential Impacts of Policy Options to Increase Fare Revenue		
Option to Increase Fare Revenue	Annual Estimate of Revenue Generated	Potential Reduction Among All Riders and Senior/Disabled/Youth Patrons
Hold senior/disabled discounts at 50 percent of full fares and offer them 24/7	\$470,000 to \$500,000	0.2% all 2.1 to 2.2% S/D
Reduce youth discounts to 50 percent and offer the discount 24/7	\$1.6 to \$1.8 million	1.2% to 1.3% all 9.8% to 10.4% youth
Eliminate youth discounts	\$8.2 million annually	3.7 % all 29.5% youth

SOURCE: King County Auditor's Office

Transit proposed changes in fare policy in February 2009 that would make discounts more in line with peers and would peg discounted fares to the base fares by specifying the percentage discount; however, the change was not accepted by policy-makers at that time.

RECOMMENDATION
A12d

Transit should reintroduce senior/disabled/youth fare discounts in line with peers and peg discounted fares to base fares by specifying a percentage discount.

The Downtown Seattle Ride Free Area Payment Methodology Is Unsupported

Transit can neither fully explain nor provide backup documentation for the operating cost savings that offset the fare revenues in the calculation of the annual charges to the City of Seattle for the city's ride free area. In 2008 the City of Seattle reimbursed Transit \$380,500. We believe that the formula likely understates the cost of providing free rides in downtown Seattle. Transit is reimbursed by the City of Seattle based on a formula that has been described by Transit staff as including:

**Ride Free Area
Reimbursement Should
Be Based on Sound,
Transparent
Methodology**

- The fare revenue lost for trips that would have been taken within the ride free area if rides were not free; and
- Operational savings resulting from reduced time buses rest at stops as a consequence of not requiring fare payment and enabling boardings through all doors.

We evaluated the material that Transit provided to support the payment amount and found that the methodology has not been updated to reflect changing conditions, some of the assumptions in the methodology used to calculate lost fare revenue were questionable, and Transit could not document or validate the calculation of operational savings.

RECOMMENDATION

A13

Transit should update and fully document the formula used to assess the City of Seattle's payment for the Downtown Seattle Ride Free Area to reflect current ridership and operating conditions including trips that are attracted by virtue of free fares. Transit and the council should then consider revising the agreement with the City of Seattle.

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6 INCREASE EFFICIENCY OF SERVICE DEVELOPMENT

Service Development Balances Customer Service, Operating Cost, and Operator Working Conditions

Chapter Summary

Scheduling service for a transit system involves striking a balance among three elements: service to customers, operating cost, and operator working conditions. In many cases, Transit's service choices have put more emphasis on frequent, timely service to transit customers and favorable working conditions for operators. These choices have come at an added cost. This cost and opportunities to increase the system's efficiencies are described in this chapter. We recommend actions that, if implemented, could result in annual savings of \$16 to \$23 million.

This chapter is a summary of a more detailed report. For more detailed explanations of concepts, findings and recommendations, please review *Technical Report B: Service Development*. The technical report also more fully explains calculations and the sources of numbers.

Summary of Findings

Transit schedulers work to develop schedules that can be achieved during typical operating conditions while providing a cushion in case buses are running late. Nevertheless, we found opportunities for improving efficiencies without necessarily cutting service. For example, current scheduling approaches have resulted in Transit spending more time and resources than are required to maintain schedule reliability. Even with the current scheduling practices there are opportunities for service provision to improve.

There Are Opportunities for More Efficient Bus Service

There are opportunities to enhance the strategic approach to Transit's service. Transit does not yet utilize performance metrics that monitor operating cost efficiency over time. This limits their ability to set performance targets and monitor progress toward ensuring that resources such as vehicles and operators are allocated to achieve lowest possible costs within the context of overall service delivery objectives. In addition, Transit does not have specific standards or guidelines that establish a framework for the trade-offs between efficient operations and other scheduling objectives (such as on-time performance or passenger crowding) to direct the systematic use of Transit data in building more cost-efficient schedules.

Transit could more effectively use their software to improve productivity and service efficiency. Although Transit schedulers use many effective methods for building schedules and assigning staff resources, they do not currently implement many of the analytical processes afforded by their scheduling software that would result in more efficient operations. In addition, Transit has a limited working knowledge of their software and has not maintained the system appropriately. Consequently, Transit uses manual processes to build its schedules and assign resources rather than taking advantage of automated optimization functions.

Over Time, Implementing All Recommended Scheduling Tools Could Save up to \$23 Million per Year in Operating Costs

Summary of Recommendations

We recommend that Transit develop a plan to implement scheduling efficiency tools. The plan should identify efficiency targets and propose a timeline for putting each tool into operation. Transit's plan should include using a strategic approach to developing schedules, optimizing scheduling processes, and improving staff knowledge of scheduling software.

Background

Transit updates its routes three times a year – in February, June, and September. Transit also takes this opportunity to reallocate buses and operators. There are three phases of the process that results in the development of a new schedule:

1. Service trip definition - When Transit planners and schedulers define service trips, they identify the routes that buses should take, how long it takes each bus to complete its route, how frequently buses should run down each route and key connection or transfer points.
2. Blocking - Blocking activities take the information developed in the first phase of scheduling, service trip definition, and assign vehicles to each service trip to form vehicle “blocks.”
3. Runcutting - Finally, schedulers take each block and assign them to a “piece of work” that will be assigned to an operator. Operators then go through a “pick” process in which operators choose pieces of work based on seniority to determine which routes they will drive until the next schedule is developed. This process is heavily controlled by the labor agreement.

Transit Buses Wait at the End of Routes Longer Than Peers

Transit owns a scheduling software system, HASTUS, with multiple modules which are designed to work together to assist staff in addressing the highly technical and data driven process of schedule development. It is a complex scheduling package with sophisticated algorithms that have the ability to create very efficient transit schedules. To ensure that it produces usable results, Transit must program the software with the conditions inherent in the current labor agreement, available fleet, local geography, and other information about Transit’s unique environment. Because of its complexity, a very high level of expertise with the software is required to produce the most effective results.

**Implementing Service
Efficiency
Recommendations
Would Save Costs and
Alter Scheduling
Practices**

Transit Can Improve Efficiency of Its Bus System

The ratio of recovery time (time a bus is waiting at the end of a route) to in-service time (the time a bus is available to carry riders) is a common metric for analyzing scheduling efficiency. Transit's percentage of recovery time is 29.2 percent. This is 5.1 to 11.7 percent higher than at other transit agencies we reviewed.

Transit systems work to maximize the proportion of time that the bus is available to carry riders and to minimize wait times. Still, there are four primary reasons a system will have recovery time built into schedules:

- Provide a cushion to allow the bus to depart on time for the next trip;
- Maintain evenly spaced time periods between buses, often called headway and when set according to an even and easily divisible time, like every 30 minutes, is called a "clock-face headway;"
- Provide time for scheduled transfers between routes for customer convenience; and
- Allow time for operator breaks, which are also required by a collective bargaining agreement.

Transit schedulers work to develop schedules that can be achieved during typical operating conditions while providing a cushion in case buses are running late. Nevertheless, we found opportunities for improving efficiencies without necessarily cutting service. For example, current scheduling approaches have resulted in Transit spending more time and resources than are required to maintain schedule reliability. Even with the current scheduling practices there are opportunities for service provision to improve. In order for these practices to be implemented, a plan and approach must be formulated.

Transit Spends More Resources Than Needed to Maintain Reliability

We found opportunities for improving efficiencies without necessarily cutting service or abandoning existing scheduling practices. Current scheduling approaches have resulted in Transit spending more time and resources than are required to maintain schedule reliability. Transit schedulers work to develop schedules that can be achieved during typical operating conditions while providing a cushion in case buses are running late.

A two-year timeline would be an aggressive, but achievable, implementation target for a plan to improve efficiency, with full savings being realized about a year following completion of the first phase of implementation. It should be recognized that these recommendations, if adopted, would not be a one-time change, but would alter Transit's scheduling practices. The recommended practices would continue to be employed as part of all future service changes.

The next sections discuss elements that should be present in the efficiency improvement plan we are recommending. These recommendations will be labeled B1a-B1j.

RECOMMENDATION B1

Transit should develop a plan to implement the schedule efficiency tools related to service development in recommendations B1a-B1j. The plan should identify efficiency targets and propose a timeline for putting each tool into operation.

Transit Should Integrate Efficiency Targets into Planning

Although Transit tracks metrics related to system reliability and efficiency, it does not fully integrate efficiency targets into its planning processes. Efficiency ratios, when utilized over time, ensure that incremental schedule changes do not degrade the

Transit Tracks Some Metrics but Should Fully Integrate Metrics that Measure Progress Towards Achieving Scheduling Efficiency Standards

cost-effective allocation of resources across the system. Transit currently tracks key performance metrics such as on-time performance and adherence to budget. Scheduling staff focus on metrics related to operational reliability and available service hours, which are not efficiency measures. One observable result of not using and tracking efficiency metrics during the scheduling process is that Transit has maintained high levels of recovery time, the time buses wait at the end of a route, from one year to another without a mechanism for identifying and rectifying the situation. *Technical Report B: Service Development, Appendix A* recommends a set of metrics.

**RECOMMENDATION
B1a**

Transit should expand its set of efficiency indicators and goals as noted in *Technical Report B: Service Development, Appendix A* and use them as targets when developing schedules. These goals should be used by management to monitor the performance of the service development group and regularly communicated to decision-makers.

Specific Guidance for Service Design and Scheduling Decisions Would Clarify Appropriate Trade-offs

Specific Guidance for Service Development Decisions Is Needed

Although there is an array of documents available to schedulers and service planners that discuss Transit priorities and service best practices, Transit does not have specific documented guidance for service development decisions. Formal standards/guidelines would establish a framework for making decisions about the trade-offs between efficient operations and other scheduling objectives. They would also provide direction about how to utilize ridership and run time data during planning. Finally, they would provide accountability and transparency to the stakeholders who fund Transit's services, and along with the performance metrics recommended above, serve as a basis for

understanding the specific costs and rationale for decisions and assessing how efficiently and effectively those funds are used to deliver transit services.

Transit reports that an internal draft of the Ten-year Strategic Plan update includes a work program commitment to compile existing guidance for transit service to be used internally, by the public, and by Transit's partners. According to Transit officials, the draft work program also calls for the development of new standards and guidelines to replace outdated or missing information.

RECOMMENDATION

B1b

Transit's planned standards/guidelines document should be completed, formally adopted, and published, providing a policy guide for Transit staff and reference document for external stakeholders.

Systemwide Analysis of Schedules and Service Can Create Further Efficiencies

Systematic Global Optimization Could Reduce the Need for Buses During Peak Periods, Saving Money

Transit does not have a systematic global optimization process in place. Global optimization is a best practice for the efficient scheduling of bus service, offering scheduling efficiencies that may not be apparent when scheduling work is limited to the specifics of each individual base, but becomes visible when the entire system is considered utilizing the full capabilities of the software. As is common industry practice, schedules at each Transit base are currently developed independently by an assigned scheduler.

Because global optimization involves systematic evaluation of the entire system, no test at individual bases will necessarily identify all of the economies that may exist for the system; however, a test of global optimization strategies was completed

**\$459,000 Annually
Could Be Saved by
Modifying How Routes
Are Assigned to Each
Base**

for North, South, and Ryerson bases, looking for opportunities to dispatch buses from one base to provide service on routes that are normally fed from another base. This test identified 12 hours a day and 5 additional peak buses that could be removed without changing service levels. Expanding the concept to the entire system could achieve savings of \$459,000⁶ per year. Additional training for operators would be required to ensure that backup drivers were qualified to drive these routes.

In addition, because global optimization systematically analyzes the efficiency of alternative ways of linking bus trips, the deadhead matrix, a listing of travel times between the system's different terminus locations, needs to be completed.

**RECOMMENDATION
B1c**

Transit should develop a process and procedures for periodic global optimization of its bus system schedule. This should include reviewing and completing the deadhead matrix.

**Up to \$19 Million per
Year Could Result From
Analyzing Bus Cycle
Times**

Round Trip Cycle Time Analysis Is Needed

Round trip cycle time is the amount of time it takes for a bus to complete one full route cycle (run time *plus* recovery time). Transit's round trip cycle times are frequently inefficient, meaning that more time and financial resources are used than are required to maintain schedule reliability. If Transit's round trip cycle times are optimized, excess recovery time could be reduced, thus cutting the number of buses needed to meet route requirements and reducing operating costs. Please review *Technical Report B: Service Development* for a more in-depth discussion of round trip cycle time analysis. A test of round trip cycle time optimization based on 20 sample routes completed by the consultants suggests that a range of \$12 to \$19 million could

⁶ The \$459,000 in annual savings is rolled into the total savings and should not be added to it. It is included here to show the impact of implementing global optimization.

be saved annually across the system once new analysis processes have been fully implemented.

**RECOMMENDATION
B1d**

Transit should employ a systematic percentile-based cycle time analysis process systemwide. This system should consider both the variation of trip times within a time period (run time) and time gaps between buses (headways) to determine a minimum round trip cycle time that can be used with confidence for scheduling purposes.

**Savings Would Result From Using Blocking Efficiency
Techniques**

Blocking is the assignment of vehicles to a pre-set schedule of trips. A set of trips assigned to one vehicle is called a block. This function can be carried out with the advanced blocking techniques in the HASTUS software, which is generally designed to minimize the number of total vehicle hours from bus pull-out to pull-in and the number of vehicles needed at the busiest times of day.

**\$735,000 per Year
Could Result From
Efficient Assignment
Trips to Vehicles**

Although Transit achieves some efficiency in blocking, processes are primarily manual and incremental and the software's advanced blocking features are not being fully employed to create efficient vehicle schedules.

Transit should utilize the software to implement scheduling procedures that assign vehicles to service trips most efficiently. By running simulations on three bases, total platform hours were reduced by 1.6 percent to 1.8 percent for an average weekday. The reduction in number of buses needed during peak times ranged from 30 to 40 buses depending on the scenario considered which translates to an annual savings of \$735,095 in

operating costs. In addition, by requiring fewer buses at peak times, capital costs of procuring buses would be reduced.

RECOMMENDATION
B1e

Transit should utilize HASTUS' Minbus module to implement scheduling procedures that assign vehicles to service trips most efficiently.

Employing Techniques for Runcutting Efficiencies Would Result in Cost Savings

Runcutting involves breaking vehicle assignments into separate service trips that will be bid on and assigned to individual operators. When the runcut begins, schedules have already been written and combined into vehicle assignments – blocks.

**\$3 Million per Year
Could Result From
More Efficient
Runcutting**

Transit is not achieving the most efficient runcut, and, like blocking, runcutting is primarily manual and incremental. The scheduling software has a tool for efficiently assigning operators to blocks. This tool employs a complex methodology to minimize total costs and must be accurately programmed in order to produce accurate and efficient results. Transit does not currently utilize this module when runcutting. To test whether Transit would be able to create a more efficient runcut by using the software tool, our consultants developed a runcutting model that analyzed all bus runs and operator assignments at three bases. Exhibit G shows applying the model at three bases resulted in reductions of about 1.6 percent of total daily operator cost and \$1.3 million per year.

EXHIBIT G**Annual Savings Associated with Fully Using HASTUS for Runcutting**

Base	Percent	Annual Savings
South	1.7%	\$553,095
North	1.0%	\$208,080
Ryerson	2.0%	\$505,920
Total	1.6%	\$1,267,095

Note: Only weekdays were included in this analysis.

SOURCE: Nelson Nygaard and Courval Scheduling

With the caveat that this analysis was not conducted on the system as a whole and is highly dependent on careful control of the ratio of full- to part-time work that must also conform to the labor agreement and actual availability of personnel, if extended to the entire system, the optimization could yield savings of as much as \$3 million per year.

**RECOMMENDATION
B1f**

To develop the most efficient runcut, Transit's HASTUS CrewOpt module should be utilized rather than the current manual runcutting process.

**Optimal Use of
Scheduling Software
Can Achieve Benefits**

Transit Should Calibrate Software to Their Unique Contractual and Operating Needs and Priorities

Calibration is the process of customizing the HASTUS software to local operating conditions and collective bargaining agreement conditions. It entails the development of rules that work as part of the HASTUS scheduling system's automated scheduling functions to:

- improve scheduler productivity by further automating scheduling practices;
- improve the efficiency of a schedule by creating more cost-effective work; and

- allow schedulers to conduct scenario testing to quickly evaluate multiple approaches to solve a problem with the fewest resources.

Transit has not calibrated HASTUS to Transit's unique contractual and operating needs and priorities. As a result, schedulers do not have advanced knowledge of HASTUS and have limited insight into HASTUS use of information within algorithms.⁷ The last calibration predates the most recent labor contract. As a result, schedulers cannot use the software module for runcutting because it produces unworkable and unrealistic scheduling output that is inconsistent with the current labor rules. This recalibration of the system will require outside technical resources due to the specialized knowledge of HASTUS and its modules that is required.

**RECOMMENDATION
B1g**

Transit should ensure full calibration of HASTUS to support schedule efficiency and to reduce the time required to produce schedules.

**Incorrect Cost
Assumptions Have
Resulted in Unreliable
Software Outputs**

**Operating Cost Assumptions in HASTUS Have Been
Inaccurate**

Cost rules, especially operator wage and fringe benefit rates, are not up to date and have not been revised to reflect current conditions, and Transit does not employ a systematic methodology for identifying the costs that should be programmed into HASTUS. Inaccurate cost assumptions inhibit the system's ability to achieve the most economical schedule, and HASTUS will produce unreliable results. Transit scheduling staff do not take full advantage of the HASTUS system's automated runcutting capabilities, citing these unreliable results produced by

⁷ An algorithm is a step-by-step series of procedures or formulas used for solving a problem or answering a question.

the system and instead rely on manual runcutting routines in areas where automated capabilities are available.

**RECOMMENDATION
B1h**

Transit should develop a systematic process for ensuring that accurate costs are programmed into HASTUS and ensure that it is updated on a regular basis.

**Software Data Fields
Have Not Been
Properly Utilized**

HASTUS Data Fields Should Be Used as Intended

HASTUS data fields have not been maintained, or in some cases, the data fields have been reallocated for unrelated purposes. The HASTUS software requires maintaining accurate data, located in appropriate fields, to provide accurate and meaningful results. Schedulers cannot take full advantage of interactive features or automated optimization features without maintaining accurate data in data fields. This means they cannot use interactive features to improve their own productivity or to improve the efficiency of the schedules they produce, and instead employ manual scheduling practices which reduce their productivity.

**RECOMMENDATION
B1i**

Transit should maintain accurate data in HASTUS data fields, including restoring algorithm-related data fields to their intended use and creating new user-defined fields as needed for external systems; populating minimum recovery durations for each trip with performance-driven minimum recovery (using the results of cycle time analysis described on page 48); and populating allowed vehicle groups for each trip.

Transit Staff Need Additional HASTUS Training

Transit schedulers have a limited working knowledge of some modules in HASTUS and currently use manual scheduling

**Transit's Manual
Approaches Provide
Limited Opportunities
for Maximizing
Efficiency and
Productivity**

approaches in place of automated scheduling solutions, limiting opportunities to make Transit operations optimally efficient and to increase schedulers' productivity. Many scheduling issues facing Transit are a result of a lack of training in scheduling software to work faster and to build more efficient schedules.

Transit should ensure that schedulers and service planners understand the mathematical relationship between minimum cycle times, headways, route length, and the corresponding number of buses required. They should also understand how to enhance efficiency through operational data utilizing systematic statistical analysis. Schedulers and service planners should be skilled in the use of HASTUS interactive and automated features so they can produce schedules faster and meet service efficiency objectives established by Transit management. Finally, they should utilize HASTUS to the full extent that its modules allow.

**RECOMMENDATION
B1j**

Transit should ensure that service development staff have the knowledge to fully utilize the HASTUS system.

7 EXPAND EFFICIENT BUS OPERATOR AND TRANSIT POLICE STAFFING PRACTICES

Chapter Summary

The design of efficient transit service entails finding a balance that ensures scheduling flexibility and operating reliability without requiring more staff time and equipment than necessary for accomplishing these objectives.

Opportunities Exist Within Labor Provisions for Operational Efficiencies

Transit designs bus service and utilizes staff in accordance with the provisions of a collective bargaining agreement with operators in the Amalgamated Transit Union (ATU 587) that has some provisions that inhibit efficient service design and the most cost-effective utilization of staff resources. While recognizing that Transit cannot act unilaterally in changing practices governed by the bargaining agreement, there may be opportunities within Transit's discretion to plan and utilize staff more efficiently.

This chapter is a summary of a more detailed report. For more detailed explanations of concepts, findings and recommendations, please review *Technical Report C: Staffing*. The technical report also more fully explains calculations and the sources of numbers.

Summary of Findings

Transit Could Utilize Operators More Cost Effectively

Because Transit does not currently collect some types of staffing data, they cannot accurately predict service reliability at different staffing levels and costs. Nevertheless, we found that given its service objectives, and the constraints under which it operates, Transit has many strategies and approaches in place for utilizing staff in a cost-effective manner. There are opportunities to more effectively manage leave. Transit cannot act unilaterally in changing the practices governed by the collective bargaining

agreement; however, there are opportunities to utilize staff resources more efficiently and to achieve cost savings within the current labor agreement.

**Metro Transit Police
Costs Have More Than
Doubled Over the Past
10 Years**

Metro Transit Police (MTP) costs have more than doubled over the last decade, mostly due to the higher cost of employing full-time deputies rather than temporary off-duty police officers. MTP is using some effective practices to manage its staffing resources; however, its methods could be strengthened. To the MTP's credit, staffing practices are in place that minimize overtime and align staffing levels with priorities and workload levels. MTP's patrol shift schedule is consistent with Transit's downtown security priorities, and staffing levels are adequate to cover Transit's geographic service priorities. However, current MTP patrol staffing levels are not adequate to consistently provide Transit's desired level of coverage for outlying bus routes. In addition, Transit has not developed a plan that describes its long-term police and security goals and explains how ongoing changes in MTP services contribute to its goals.

Summary of Recommendations

We recommend that Transit capture additional data and modify current data sources to assist them in analyzing the relationship of staffing to bus system performance, more effectively manage leave, and investigate opportunities and incentives for more extensive use of overtime in lieu of full-time staff, when such use would be cost effective. Transit should also evaluate more extensive use of part-time operators to provide coverage for operator absences, and take additional steps to monitor and control operator absences.

We recommend that Transit use a more statistically sound approach to calculate its MTP staff coverage needs and costs, and use lower cost staffing options when they are consistent with

security objectives. We also recommend that Transit develop a more comprehensive approach to Sound Transit costs and develop a long-term plan and performance measures for the MTP.

Transit Should Capture Data to Assist Them in Analyzing the Relationship of Staffing to Performance

Data Is Key to Better Analysis of Performance and Identification of Potential Efficiencies

Report operators backfill for operator absences and cover random, immediate absences, such as operator illness. Extra Board operators also cover absences, but are given their assignments in advance to the extent possible. The relationship has not been established between bus service reliability, and the size of the Report and Extra Board staffing and related staff resource use such as overtime. This means that bus service reliability at different staffing levels and costs cannot be accurately predicted. Modeling this relationship would be difficult given the large number of constraints and variables that would need to be taken into account. In addition, current information systems have not been designed in a way that would facilitate this kind of modeling.

RECOMMENDATION C1

Transit should capture additional data and modify current data sources to aid in the analysis of the relationship of staffing levels and staffing resource utilization to performance.

Transit Could More Effectively Manage the Costs of Planned and Unplanned Leave

Planned absences include known absences such as scheduled vacation, holidays, and use of accumulated compensatory time. Unplanned absences include sick leave, unpaid leave of absence, and job injury. As levels of unplanned absenteeism

increase, the number and cost of maintaining contingency operators also increases.

Staffing costs are minimized if planned absences are controlled. We found that the major category of planned absences – vacations – cannot be tightly controlled under the constraints of the collective bargaining agreement, which means that Transit's approach to determining coverage for staffing needs does not work as intended. There is significant variability in absences for vacation leave. Transit and the union have not been able to reach agreement on one approach to minimize this variability; keeping vacations tied to bases instead of the more expensive practice of following operators as they move from base to base. Nevertheless, working within the collective bargaining agreement, Transit has taken several steps to keep vacation use predictable.

**Transit Faces
Challenges in
Managing Absences
and Controlling Related
Costs**

Unplanned absences are difficult for Transit and its peers to manage. There are three factors that result in Transit's reduced control over the cost of unplanned absences: labor agreement provisions, a payroll system process needing revision, and lack of needed data. Under the terms of the labor agreement, Transit cannot currently require medical verification from a licensed practitioner except in limited circumstances. Instead, Transit employees self-certify sick leave. While recognizing that this benefit was bargained for during the labor negotiation process, we found that the current labor agreement impacts Transit's ability to manage excessive sick leave absenteeism by preventing the agency from requiring medical verification. Transit operators who run out of accrued sick leave while absent are defaulted to Unpaid Leave of Absence through the payroll reporting system based on past practice even though the current labor agreement states that Transit must approve requests for unpaid leave of absence. Although Transit uses HASTUS to

track some instances of sick leave usage, Transit has not purchased the HASTUS Employee Performance Manager module (EPM). EPM assists users in managing disciplinary actions and awards based on rules configured to provisions of the collective bargaining agreement. Improved access to information like this, whether through EPM or another application that pulls data from HASTUS, would allow staff to better track a range of performance indicators based on rules configured in accordance with collective bargaining agreements.

Reducing Two Days of Sick Leave per Full-Time Operator Could Save \$1.2 Million per Year

In order to give an idea of the magnitude of the impact of unplanned absences, we calculated that if sick leave usage for full-time operators were reduced by two days per year, the cost savings could be in the range of \$1 million to \$1.2 million.

RECOMMENDATION C2

In order to more effectively manage the costs of planned and unplanned operator leave, the following issues should be addressed:

- Transit should quantify the cost impacts of leave procedures, and the county's representatives should take these costs into consideration when negotiating the next labor agreement.
 - Transit should adjust its payroll procedures so that operators who run out of sick leave do not automatically default to unpaid leave of absence in conformance with the labor agreement.
 - Transit should utilize data available in HASTUS to monitor sick leave usage in accordance with the collective bargaining agreement.
-

Having a Larger Pool of Coverage Operators Than Needed Costs \$0.5 to \$11.5 Million Each Year

There Are Opportunities for Transit to More Cost Effectively Manage Operator Staffing

Currently Transit employs approximately 1300 regular full-time operators and more than 900 part-time operators who have standard workday driving assignments. These operators take vacations, receive training, are sometimes sick, and are absent from work for other reasons during the course of the year. To ensure that their driving shifts are covered and that bus service remains reliable, Transit also employs approximately 500 additional full-time operators of two types, Report operators and Extra Board operators. A key distinction between Report operators and Extra Board operators is that Report operators cover more random, immediate absences, such as operator illness, and must be qualified on at least 75 percent of the routes at their assigned base at the beginning of a shakeup, and then qualified on 100 percent of routes within 30 days. In contrast, Extra Board operators are given their assignments in advance to the extent possible.

For the spring 2009 schedule change, the actual size of Report and Extra Board staffing was approximately 525, which was 132 operators more than the calculated need at the beginning of the schedule change. Over the last nine years, the range in actual staffing versus calculated need has ranged from 6 to 132.

Translated into current dollars, this range equates to approximately \$0.5 million to \$11.5 million, with the average of 70 operators more than needed were assigned to the Extra Board. This represents approximately \$6.1 million.

One reason the actual numbers exceed the calculated need is due to the emphasis on ensuring that sufficient staff resources are available to minimize the number of cancelled or delayed runs; however, it is not clear that there is a strong causal

relationship between Report and Extra Board size and service reliability.

Transit also makes use of overtime when there is not enough staff on duty to maintain service reliability. Due to the provisions in the current labor agreement, Transit does not use part-time operators on overtime for backfilling other than vacation relief even though it may be the least-cost alternative.

**The Cost of Options for
Backfilling Absences
Varies Widely**

Constraints on the use of overtime and part-time operators come at cost. The hourly cost for a full-time operator on overtime is approximately \$49.26, and the cost of a full-time operator, plus coverage for their absences, is almost the same -- \$49.11. A potential benefit of using overtime is that in most cases elimination of idle time, often called “bonus time,” is possible. For example, when the Extra Board is used to backfill for part-time operators, they may be paid for more time than they are needed since they must be paid for a minimum of eight hours but may actually work fewer hours.

The following is an example of the cost of each option for backfilling a part-time assignment and shows that backfilling a part-time assignment with a full-time operator can be the most expensive option.

The length of a typical assignment for part-time operators who were 0.5 FTE or greater and had single assignments was about 5 hours and 21 minutes.⁸ The options and costs for backfilling this length assignment would have been:

⁸ This assignment length was during the spring 2008 shakeup. The range was from 5 hours to 6 hours and 48 minutes. For the most recent shakeup in February 2009, for part-time operators who were 0.5 FTE or greater and had single assignments, the average was about 5 hours and 23 minutes, which is almost the same as the spring 2008 average.

Using Full-Time Staff to Provide Coverage for Part-Time Staff Can Be the Most Expensive Option		Cost per Day
	Backfill w/ a part-time operator	\$242.54
	Backfill w/ an extra board operator receiving a minimum 8-hour pay	\$392.91
	Backfill w/ a full-time operator working overtime	\$262.83
	Backfill w/ a part-time operator working overtime	\$238.60

Transit is utilizing full-time Report and Extra Board operators to fill in for part-time operators 65 percent of the time, which implies that there were numerous instances when less expensive overtime or part-time backfill could have been used, if these types of backfill had been available and permitted.

More extensive use of part-time operators, who could provide backfill in lieu of using the Extra Board, could result in cost savings. Currently, the number of part-time operators is capped by the collective bargaining agreement at 45 percent of the combined total number of full-time and part-time Transit operators, and part-time operators are not allowed to work on Saturdays and Sundays.

RECOMMENDATION C3

Transit should further investigate opportunities and incentives for more extensive use of overtime in lieu of full-time staff, when such use would be cost effective, and more extensive use of part-time operators to provide backfill in lieu of using the Extra Board.

Transit Police Costs Have More than Doubled since 2000 to \$13.7 Million in 2009

Metro Transit Police's (MTP) costs have increased substantially in recent years largely as a result of a 1993 council ordinance and 2003 motion that directed Transit to develop a full-time transit police organization using full-time King County Sheriff's

**Full-Time Deputies Are
More Expensive Than
Temporary Officers**

Office (KCSO) deputies and to gradually discontinue its practice of using temporary off-duty officers from the Seattle Police Officer's Guild. Most of MTP's increased cost is attributed to the higher cost of employing full-time deputies rather than temporary off-duty police officers. Full-time deputies receive days off each week, paid vacation, and sick leave that needs to be backfilled, and other county benefits such as health care and a police vehicle. The hourly rate for temporary off-duty officers is \$39.96 compared to an approximate hourly rate for Sheriff's Office officers of \$86.00, which includes benefits and an assigned take-home patrol car. Because Transit attempted to retain roughly the same level of police coverage using sheriff's deputies as it did with temporary off-duty officers, its overall costs for police coverage increased.

Exhibit H shows the comparative cost of staffing resources used by the MTP.

EXHIBIT H	
Metro Transit Police Comparative Staffing Resource Costs	
Staffing Type	Cost per Hour
Olympic Security Guards	\$14.99 - \$15.87
Off-Duty Police Officer (Seattle Police Guild)	\$39.96
KCSO Transit Police Deputy	\$86.00 to \$118.00 (with backfill)

SOURCE: King County Auditor's Office

As the exhibit shows, the cost of KCSO deputies is considerably higher than that of temporary off-duty officers and Olympic Security guards. Transit and the MTP have demonstrated that in some cases, such as security within the transit tunnel, less expensive staffing resources can be used to meet Transit's security objectives. Additionally, as found in past audits of the Sheriff's Office, using existing deputies working overtime to provide additional coverage can be a much less expensive staffing option compared to hiring additional full-time employees.

Deputies working overtime already have their assigned patrol cars, paid health benefits, and annual leave. These three cost advantages outweigh the fact that deputies working overtime earn one and one-half times their regular pay.

RECOMMENDATION C4 Transit and Metro Transit Police management should identify opportunities to use lower cost staffing options when they are consistent with security objectives.

Transit Police Staffing Methods Could Be Improved

MTP uses average absence rates to estimate the number of deputies needed to backfill, or provide coverage, when other deputies are on vacation or sick leave. While this approach can be accurate for larger groups of employees (100 plus), the use of average leave rates is not statistically accurate for estimating the number of daily absences for small groups of employees like MTP has on each shift. In addition, this approach does not take into account the inevitable need for overtime when planned staffing is not adequate to cover unexpected sick leave absences.

In 2008, Police Staffing Levels Did Not Provide Desired Coverage in Some Areas

MTP staff resources and shift plan are enabling MTP to achieve scheduled staffing levels for its highest priority geographic areas. Although staff were added in 2008 to provide additional coverage for South King County patrols, analysis shows that staffing was not adequate to provide the level of coverage desired. This is likely a result of their current approach to estimate staffing needs, as it typically underestimates the backfill staffing needs of very small groups. Transit and MTP report that they have been unable to provide the desired level of police coverage to the North and South King County areas due to insufficient staffing.

RECOMMENDATION C5 The Metro Transit Police should strengthen its staffing management practices by employing a more statistically sound approach to planning its staffing needs and by regularly updating its employee absences to reflect actual absences and backfill needs of Metro Transit Police Officers.

Compensatory Time Practices Are Not Predictable

One area of ongoing concern is that of compensatory time (comp time). As found in previous audits of the Sheriff's Office, deputies receive "comp time on demand," which means that management must grant their requests to use their earned comp time even if very short notice is given. Although not in the collective bargaining agreement, this is an established practice that limits management's ability to plan for absences and reduce overtime expenditures. If a comp time absence must be covered by another deputy then this results in an additional cost to Transit. However, there is no extra cost if the absence does not need to be backfilled. MTP management could mitigate the cost impacts of comp time by getting advance notice when possible and by scheduling employee comp time absences when extra scheduled staff are already available.

RECOMMENDATION C6 The Metro Transit Police should work with its employees to schedule their comp time absences and avoid the need to backfill whenever possible.

Reimbursement for Transit Police Services Supporting Sound Transit Is Not Comprehensive

MTP's activities support Sound Transit buses (which are operated by Transit drivers) as well as the transit tunnel. The services MTP provided to Sound Transit accounted for approximately nine percent of total Metro Transit Police costs in

2008, and an estimated 19 percent in 2009. The increase is a result of the extended tunnel operating hours to support light rail operations. Sound Transit reimburses Transit for the cost of these services.

**Recovery Calculations
for Police Services
Supporting Sound
Transit Should Be More
Precise**

Our review of the cost-allocation method used to calculate costs of providing MTP staffing for the transit tunnel appears to be reasonable for general planning, but should be refined for cost-recovery purposes. The method used to estimate staff resources allocated to Sound Transit services is the same method used to plan MTP staffing coverage, which, as noted in the previous section, is not the best method to use for small groups of staff. Finally, as discussed, the use of an overall average amount of available deputy time for post coverage purposes is not a statistically accurate means of estimating staffing needs. The method used to calculate Sound Transit's share of MTP deputy costs could be strengthened by using binomial analysis⁹ to model and calculate the most cost-effective mix of staffing resources.

RECOMMENDATION C7

Transit should develop a more precise approach to calculating and charging for Sound Transit's portion of tunnel-related police costs.

A Long-Term Vision and Plan Needed to Provide Clear Policy for Transit Security Operations

Our review found that Transit does not have a long-term plan for the MTP function that describes what its priorities and long-term goals are for the organization. Transit's efforts over the last decade have focused on responding to immediate needs such as

⁹ This staffing analysis approach calculates annual amounts of vacation leave and the number of deputies needed to cover these absences. This amount can be determined ahead of time and will have very little variability if leave is closely managed. Historical sick leave rates and planned staffing levels are used to statistically estimate the likelihood that enough deputies will report for work to provide the planned level of shift coverage and to estimate the number of shift hours that cannot be covered with scheduled staff.

operating changes in the tunnel, Light Rail implementation, and transitioning its force to a permanent, full-time transit police organization. Important policy decisions have also been made about Transit's top security priorities that have impacted operational decisions and greatly increased costs. However, this was done in the absence of a clear policy framework and plan.

**Plan Would Guide
Internal Prioritization
and Monitor Progress
Toward Goals**

Transit would benefit from having a clear long-term plan for MTP, with goals, objectives, performance measures, and targets. Such a plan would guide internal planning and prioritization of security activities and resource use decisions, and be used to monitor and evaluate progress towards meeting Transit's security-related goals. It would also be a useful tool to communicate information on goals, priorities, activities, and resource use with outside stakeholders such as Transit's ridership, the general public, and county decision-makers.

RECOMMENDATION C8

Transit should develop a long-term vision and plan for the Metro Transit Police that includes a vision, goals, and objectives, as well as, measures and targets to track progress towards achieving these goals and objectives. This should be integrated with Transit's strategic plan.

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8

IMPROVE PARATRANSIT COST EFFECTIVENESS AND POLICY CHOICES

**Access Costs Have
Risen While
Productivity Has
Generally Declined**

Chapter Summary

Access is Transit's paratransit program, required by the Americans with Disabilities Act (ADA). The service is expensive: it costs nearly \$40 a ride to provide, but recovers less than \$1 per ride in fares. Although there has been an increase in productivity in 2009, for the most part, the program's costs have risen while productivity has declined. Transit has devoted significant staff resources to contain paratransit costs, creating unique programs and functions that appear to be cost effective but may reduce paratransit productivity.

We recommend that Transit develop a strategic plan to improve paratransit productivity, continue its cost-containment efforts, and provide council with policy options to deliver more efficient service, including the option to scale back service to baseline levels required by the ADA.

This chapter is a summary of a more detailed report. For more detailed explanations of concepts, findings and recommendations, please review *Technical Report D: Paratransit*. The technical report also more fully explains calculations and the sources of numbers.

Summary of Findings

We found that Access sets goals and monitors reports related to productivity, but does not have a strategic plan for investigating factors for productivity declines or identifying solutions to reach goals. Access has developed several successful programs to contain costs. Access provides service and fare levels that are more generous than required by the ADA.

Access's contracted reservationist and scheduler staff appear to be effective and are well-trained and experienced in comparison to peer agencies. Access has many more agency staff than peers and does not currently conduct comprehensive staffing analyses. Transit has not enforced its contractual incentives to promote contractor productivity.

Summary of Recommendations

In order to improve Access's productivity and reduce costs, Transit should:

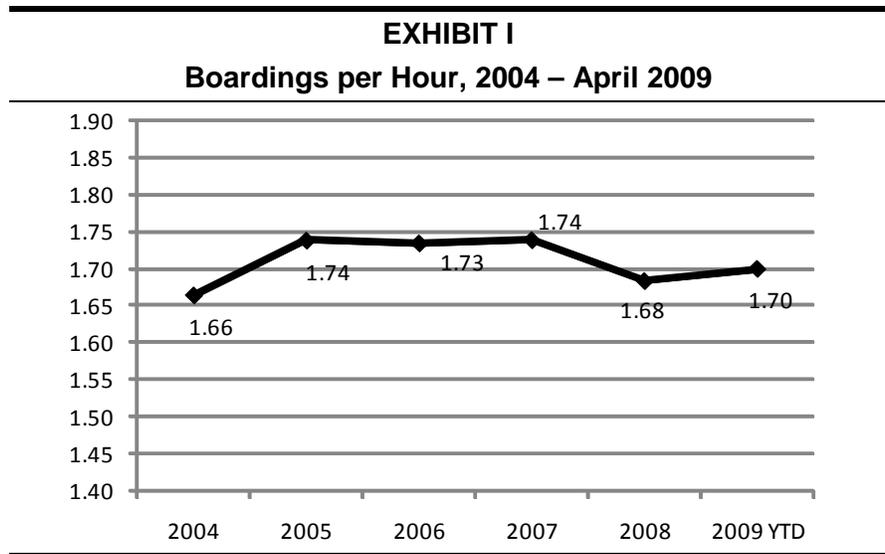
- Adopt a comprehensive, fully documented strategic plan and approach to address how productivity goals are to be met and should regularly reassess its paratransit productivity goal, based on historical trends and the anticipated future service environment.
- Continue Access's cost containment efforts and monitor their effectiveness while expanding Community Access Transportation (CAT) and other alternative service programs proven to effectively offset the cost of the more expensive Access services.
- Submit a plan to council detailing the potential savings and impacts on customer service if Transit adjusts paratransit service and fares to levels allowed by the ADA.
- Develop a thorough staffing model that incorporates workload factors and processes, efficiency benchmarks, impacts of workload changes on staffing needs, and the effects of staffing changes on Access performance.
- Monitor and enforce its contract incentives and penalties for a period of one year, and then re-evaluate their usefulness as a tool for improving productivity.

If Access's 2008 Productivity Goal Was Met, Transit Would Have Saved \$2.8 Million

Access Has Not Defined a Strategy for Achieving Its Productivity Goal

A common practice among large transit agencies is to develop strategic plans for achieving productivity goals and objectives that support the agency's mission. Access has implemented some features of a strategic plan. However, Access has not defined a strategy for achieving its performance goal. It should be noted that there are factors in productivity that are outside the control of Access while others are fully or partially within the agency's control.

Exhibit I shows recent trends in Access productivity in terms of boardings per hour.



SOURCE: Nelson Nygaard

Every .04 Increase in Boardings per Hour Saves \$1 Million per Year

As Exhibit I indicates, there was a 4.8-percent increase in Access's productivity as measured by boardings per hour in 2005. Productivity remained relatively constant between 2005 and 2007 and declined 3.4 percent in 2008. While these changes in productivity may seem inconsequential, very small changes in productivity equate to very large changes in expenditures. In 2008 each increase of 0.01 saves nearly \$240,000 per year. For

example, if productivity was 1.72, or 0.04 more than what is recorded for 2008, the service would have cost \$950,000 less to provide. The cost impact of Access not attaining its productivity goal can be quantified by examining the reduction in hours that would be possible at the higher productivity rate of 1.8 boardings per hour. If 2008's goal was met, Access would have saved \$2,842,000.

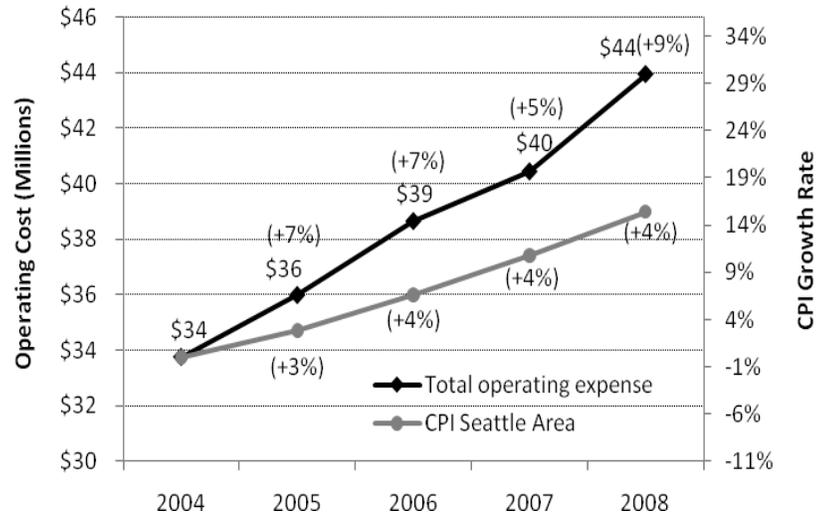
RECOMMENDATION D1 Transit should adopt a comprehensive, fully documented strategic plan and approach to address how productivity goals are to be met and should regularly reassess its paratransit productivity goal based on historical trends and the anticipated future service environment.

Access's Costs Are Growing Despite Cost Containment Efforts

Access Operating Costs Grew 30 Percent Over the Past Five Years

The trends show steadily growing costs for the program as measured by cost per hour, cost per mile, and cost per boarding. In addition, Exhibit J indicates the total program operating costs grew nearly 30 percent over the past five years, while the CPI grew by 15.4 percent. Access's costs exceed those of its peers. Its cost per hour and cost per mile are the highest of the peer group. Access's cost per boarding is exceeded only by Denver.

EXHIBIT J
Growth in Total Operating Expenses Compared to Growth in
CPI 2004 - 2008



SOURCE: Accessible Services Year-End Performance Reports, Bureau of Labor Statistics CPI Index for Seattle

Each Trip on Access
Costs Nearly \$40

Access, along with some of the peers, seeks to control the growth of the ADA paratransit system and therefore overall costs of the program. One of the multiple programs that Access has put in place is the Community Access Transportation (CAT) program. CAT was established in 2003, with the purpose of providing used vehicles to community agencies in exchange for those agencies providing service to their own clients, as well as to certified ADA eligible persons who would otherwise have qualified for more expensive Access services. In 2008, the average cost for a CAT trip was \$4.80, compared to an Access trip of \$39.17. In 2008, CAT provided 155,456 trips. Thirty eight percent of these trips would have been eligible for ADA Access service. This resulted in potential cost savings of up to \$1,567,712. Access estimates that CAT could grow by 25 percent over the next two years, which would yield an additional \$2 million in savings.

Expanding the CAT
Program Could Yield \$2
Million

RECOMMENDATION D2 Transit should continue Access's cost containment efforts and monitor their effectiveness while expanding CAT and other alternative service programs proven to effectively offset the cost of the more expensive Access services.

Limiting Access to ADA Requirements Would Save More than \$3.8 Million, But Would Impact Service

Transit Exceeds ADA Service Requirements for Hours, Area, Level

Access exceeds minimum ADA requirements, which also drives up costs. Access exceeds legal requirements in relation to service area, service hours, service level,¹⁰ and fares.

The potential cost savings and net revenue increases are estimated to be between \$1.9 and \$3.8 million plus any savings from reduction in level of service, as illustrated in Exhibit K.

EXHIBIT K

Cost of Exceeding ADA Standards and Potential Revenue from Meeting ADA-Allowed Fare Levels

Service category exceeding ADA standards	Boardings in 2008	2008 net costs
Service hours	26,533	\$858,149
Service area	14,133	\$166,286
Level of service	595,641	Unquantified. High cost.
Total costs		\$1 Million

Fare Options	Boardings in 2008	Potential additional revenue
Fares at \$1.75	1,121,776	\$841,000
Fares at \$3.50	1,121,776	\$2,804,000
Total potential revenue		\$0.8 - \$2.8 Million

SOURCE: Nelson Nygaard

¹⁰ Transit believes that there may be legal issues that would arise from reducing this level of service. The auditors did not evaluate related risk or legal issues.

These changes would impact the level of service for Access customers. This audit did not attempt to quantify the magnitude of these service impacts. Decisions about level of service and fare amounts will be dependent on policy goals.

RECOMMENDATION D3 Transit should submit a plan to council detailing the potential savings and impacts on customer service if Transit adjusts paratransit service and fares to levels allowed by the ADA.

**Access Call Center Staff
Have Longest Tenure
Compared to Peers**

Transit's Call Center Staff Are More Experienced and Effective by Some Measures than Peers

Access's call center primarily employs three employee classifications: reservationists, schedulers, and dispatchers. Reservationist effectiveness is measured by looking at several key indicators, including average time on hold, percent of reservation calls answered within three minutes, and average time to process trip requests. These measures show Access reservationist staff to be effective when compared to its peers and draft industry standards. Training and experience is measured by looking at several key indicators, including initial and ongoing training provided, average length of experience, and turnover rate. The amount of training provided to Access staff is considerably higher than two peers, but lower than one other. Access reservationists have an average tenure of four years on the job. Access has the longest tenured staff relative to the peer group.

There Are Opportunities to Develop a Comprehensive Staffing Model

A total of 24 non-contracted staff works in Access, which exceeds the number of agency staff at any of the peers contacted. Access provided a listing of staff that they believe

Access Has More In-House Staff Than Peers

provide services that are not provided by peer agencies, as shown in Exhibit L. When these staff are subtracted, Access still has four more agency staff than its next closest peer.

EXHIBIT L				
Comparison of King County Access Agency Staff to Peer Agency Staff				
	King County Access Staff	Denver Staff	Minneapolis Staff	Portland Staff
Total agency staff	24	6	9	10
King County Access staff who provide services that peers do not				
Service Quality	1			
CAT Program	2			
Grant Funded Programs	1			
Trip by Trip Eligibility	2			
Recertification	4			
Total agency staff minus King County Access staff who provide services that peers do not	14	6	9	10

SOURCE: King County Auditor's Office, Nelson Nygaard

Transit Does Not Have Objective Method to Determine Actual Staffing Needs

Access has not developed a comprehensive staffing model. Using a staffing model to analyze Access's workload and productivity could provide objective guidance for establishing the most efficient staffing level. Such models analyze current staffing needs and identify the costs and benefits of alternative staffing arrangements.

Access's three service providers have a total of 495.5 employees: 403 drivers, 36.5 mechanics, 6 training and safety staff, 17 administrative staff, 11 schedulers/dispatchers, 21 operations staff, and 1 IT staff. The call center contractor employs 91.5 people: 10 training and safety staff,

4 administrative staff, 37 schedulers/dispatchers, 7 IT staff, 10 passenger service staff, and 23.5 reservationists.

If extended to contractor responsibilities, the staffing model could assist Access in determining appropriate staffing and compensation levels during the contracting process.

RECOMMENDATION D4

Transit should develop a thorough staffing model that incorporates workload factors and processes, efficiency benchmarks, impacts of workload changes on staffing needs, and effects of staffing changes on Access performance.

Transit Has Not Enforced Contract Performance Provisions and Penalties

New contracts between Access and its providers took effect in August 2008, and they include incentives and penalties related to exceeding or not meeting established productivity or service quality standards.

**Productivity Goals
Have Not Been Met by
Contractors**

The productivity goal established in the contracts has not been met, so there has been no opportunity to implement incentive payments for that purpose. Although the county has the option to impose penalties for failure to meet productivity and other standards, management has elected not to impose them in this contract period. Because they are not enforced, there is no incentive for providers to mitigate or minimize conditions specific to the service penalties included in the contracts. Access's current practice of not enforcing expectations and consequences sends a mixed message to contractors, and is not likely to result in changing performance. Furthermore, it is possible that prospective service contractors, in anticipation of incurring fines or penalties, may include these costs in their estimates when bidding on the service. However, at present it is not possible to

fully understand the consequences or impact the inclusion of incentives and penalties may have on performance.

RECOMMENDATION D5 Transit/Access should monitor and enforce its contract incentives and penalties for a period of one year, and then re-evaluate their usefulness as a tool for improving productivity and performance.

9 IMPROVE PRODUCTIVITY ANALYSIS OF VEHICLE MAINTENANCE

Transit Has High Standards for Vehicle Maintenance

Chapter Summary

This chapter evaluates two aspects of Transit's vehicle maintenance program: preventive maintenance and maintenance productivity. Although Transit has an outstanding record of on-time preventive maintenance inspections, it is not currently tracking unplanned maintenance, which is a useful measure of preventive maintenance productivity. Transit employs some productivity standards and performance measures, but has opportunities to better manage its productivity by developing standards for more maintenance activities and establishing its standards and measures systemwide.

This chapter is a summary of a more detailed report. For more detailed explanations of concepts, findings and recommendations, please review *Technical Report E: Vehicle Maintenance*. The technical report also more fully explains calculations and the sources of numbers.

Summary of Findings

For 2008, Transit conducted 98.8 percent of its preventive maintenance inspections on time, which exceeds both Transit's own goal and the Federal Transit Administration's standards. However, Transit's high standards may result in some unnecessary costs. In addition, although monitoring the amount of unplanned work is an important management tool that helps contain maintenance costs, we found that Transit does not monitor such work hours on a regular basis.

While Transit has established productivity standards for certain vehicle maintenance activities, enforcement of these standards

varies from base to base. In addition, Transit has not yet implemented productivity standards for tasks that would be appropriate for standards beyond preventive maintenance inspections. At the agency level, Transit tracks a variety of vehicle maintenance productivity indicators. However, each maintenance base manages its own maintenance activities and performance measurement. Transit has not formalized a maintenance productivity program across the agency.

Summary of Recommendations

To resolve the issues identified in the analysis of Transit's vehicle maintenance, Transit should:

- Initiate a pilot program to shift the preventive maintenance interval on a control fleet at the Bellevue base.
- Track and monitor planned and unplanned work and formulate a strategic approach to manage unplanned work.
- Monitor adherence to vehicle maintenance and inspection productivity standards and work to ensure consistency in the standards across bases.
- Expand productivity standards beyond Preventive Maintenance Inspections (PMIs) to other routine jobs.
- Establish a systemwide maintenance productivity program, expanding on current productivity standards and performance measures.

Transit's On-Time Performance for Preventive Maintenance Is Outstanding

Preventive Maintenance Inspections

An effective maintenance program requires regular preventive maintenance inspections (PMIs) designed to ensure maximum vehicle longevity. PMIs include a series of diagnostic tests and checks as well as scheduled replacement of fluids and filters. Well-planned and scheduled PMIs will reduce the incidence of unscheduled repairs and ensure the vehicles meet their useful life. While early inspections are undesirable because they

commit resources sooner than needed, late inspections may compromise safety as well as drive up costs.

Transit Has Stricter Inspection Intervals Than the FTA

The FTA specifies that inspections that are conducted within 10 percent of scheduled mileage intervals are considered on-time and requires that 80 percent or more of the inspections must be performed on time. As long as that standard is achieved, grantees meet FTA's requirements. Transit's inspection target is stricter than the FTA standard. To be considered on time, Transit targets a window of plus or minus 400 miles of the scheduled inspection interval for diesel and hybrid buses. Transit's target for on-time trolley bus inspections is plus or minus seven days of the scheduled time interval. In 2008, Transit inspected its buses on time 98.8 percent of the time, exceeding its systemwide goal of 98 percent of inspections on time. Transit also far exceeds FTA's 80 percent standard for on-time PMI adherence.

Overall, Transit's on-time performance of preventive maintenance inspections is outstanding. This performance helps ensure maximum vehicle longevity and reliability. However, Transit's window of tolerance for these inspections (every 400 miles instead of every 600 miles) may result in some level of unnecessary inspection. For the Bellevue base, it is estimated that conducting PMIs within a 400-mile window rather than a 600-mile window increases the level of effort associated with PMIs by 5.2 percent.

Transit may have an opportunity to save maintenance resources by extending its on-time window to the FTA standard. In order to evaluate this possibility, Transit could extend the window at one base and monitor the resulting maintenance costs and reliability statistics. If the program shows cost savings and no degradation of reliability statistics, then Transit should expand the practice to other bases.

RECOMMENDATION E1 Transit should initiate a pilot program to extend the preventive maintenance interval to +600/-200 miles on a control fleet at Bellevue base.

**Decreasing Unplanned
Maintenance Increases
Reliability, Reduces
Costs**

Planned Versus Unplanned Work

Planned maintenance increases service reliability, reduces overtime expenditures, and supports planning for staffing levels. Not all activities can be planned in advance; accidents, vandalism, trouble calls, and other “reactive” work are not completely avoidable. While there is no industry standard on the ideal balance between planned and unplanned maintenance, the distribution of maintenance labor by activity type is a critical management tool to assess the efficiency of the maintenance operation.

Transit has not set a target for unplanned work. Rather than specifically tracking planned and unplanned maintenance, Transit tracks maintenance work by more discrete categories in its Maintenance Management Information System. While acknowledging that Transit does not track the number, vehicle maintenance supervisors estimated that 70 percent of their maintenance operation was planned work. Exhibit M shows the percentage of planned maintenance work was 47 percent systemwide in 2008.

EXHIBIT M**Percentage of Planned Maintenance Work by Base,¹¹ 2004-2008**

Year	System	AB	BB	CB	EB	NB	RB	SB
2008	47.4%	46.1%	46.3%	55.8%	54.3%	45.6%	41.5%	51.4%
2007	48.3%	47.9%	48.3%	58.1%	57.2%	42.9%	40.2%	52.1%
2006	48.0%	45.2%	61.1%	56.3%	54.8%	45.2%	42.4%	50.6%
2005	48.6%	48.0%	58.7%	54.1%	53.1%	46.1%	52.1%	47.9%
2004	47.0%	47.0%	56.4%	49.5%	52.6%	45.4%	52.6%	43.5%

SOURCE: Transit's Maintenance Management System, Booz Allen Hamilton

The percentages of planned work may be higher than shown in Exhibit M. Transit staff estimate that approximately 21 percent of shop requests could be reclassified as scheduled work, since maintenance chiefs typically bundle shop and operator requests to be performed when the bus is being serviced for other non-safety reasons. Transit does not currently code these activities as scheduled work.¹²

RECOMMENDATION E2 Transit should track and monitor planned and unplanned vehicle maintenance work and formulate a strategic approach to manage unplanned work.

Transit Has Opportunities to Improve and Manage Productivity Standards

Transit Does Not Regularly Assess Adherence to Its Productivity Standards

Productivity standards specify the duration of time, generally in hours, that is expected to carry out a particular maintenance activity. Multiplying workloads by internal time standards provides vehicle maintenance decision-makers with a clear estimate of the staff resources needed for these activities. In addition to its usefulness as a planning tool, closer oversight of the standards can help managers improve workforce productivity, identify

¹¹ AB=Atlantic Base, BB=Bellevue Base, CB=Central Base, EB=East Base, NB=North Base, RB=Ryerson Base, SB=South Base

¹² Transit's current practice of excluding this work from planned work is consistent with industry definitions.

problem areas that can be addressed with remedial training, and enhance overall accountability.

Base Supervisors Take Some Steps to Monitor Productivity, More Can Be Done

Transit has implemented what they call “internal time standards” for the major preventive maintenance inspections that meet collective bargaining agreement provisions. The standards vary by base and by type of bus. Although there is some attention to standards at some bases, at the system level Transit does not run regular reports to assess adherence to productivity standards. Such reports would not only allow Transit to evaluate its performance against its standards, it would also allow Transit to refine its standards when appropriate.

Regular comparisons of actual inspection times to productivity standards are a powerful means to evaluate actual performance and to establish meaningful standards.

**RECOMMENDATION
E3a**

Transit should regularly monitor adherence to vehicle maintenance productivity standards and work to ensure consistency in the standards across bases.

Productivity standards could easily be expanded beyond PMIs to heavy repair activities, as well as other replicated maintenance activities at the operating bases, such as component removal and replacement, brake relines, and AC servicing. While Transit has conducted research into expanding productivity standards to other repeatable maintenance activities, it has not yet implemented these standards.

**RECOMMENDATION
E3b**

Transit should expand vehicle maintenance productivity standards beyond preventive maintenance inspections (PMIs) to other routine jobs.

**A Consistent and Documented Productivity Program
Could Improve Transit's Productivity**

A well-documented and consistent productivity program facilitates tracking and monitoring productivity. Over time, agencies manage productivity improvement by tracking and monitoring their progress toward achieving their productivity program goals. Transit does not have a formal maintenance productivity program that is consistent across the system. However, Transit has established a performance reporting framework that tracks key maintenance productivity and performance metrics, and a number of other productivity indicators are used informally throughout the year, both by the base supervisors and by members of Vehicle Maintenance Administration.

**Transit Could Expand
on Current Productivity
Practices**

Without a well-documented and consistent productivity program, productivity changes cannot be measured incrementally by category. While the autonomy of the base supervisors has some benefits (such as trying new approaches that can evolve into best practices), carrying out systemwide improvements requires all bases to conform to the same productivity measures and targets. In order to identify the most productive (and replicable) practices at different bases, Transit needs to be able to compare operations using the same metrics.

**RECOMMENDATION
E3c**

Transit should establish a systemwide vehicle maintenance productivity program, expanding on current productivity standards and performance measures.

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10 ENHANCE PLANNING FOR RIDERSHIP DATA, EMERGENCY COMMUNICATIONS

Chapter Summary

This chapter discusses the tools that Transit uses to collect and process data about ridership and their communication with customers during emergency events such as severe weather. These topics are quite discrete, but both involve analysis of technology and its interface with users, whether the users are Transit analysts or Transit customers. Ensuring that the right technology tools and approaches are used and that the outputs of the technology achieve Transit's goals is important to the organization's success.

Transit Is Currently Upgrading Major Systems

Transit is currently upgrading its technologies to better communicate with customers during emergencies, to process rider fares, to count passenger boardings and alightings,¹³ and to track the physical location of the buses. Individually, this information is important, and when combined it provides critical information to Transit's service development analysts that can help them to provide the best service to the riding public. During the process of transitioning to new technology, Transit must ensure that service development staff have the resources to provide the most efficient and effective service. This will include ensuring that they have the best data to process and that systems are integrated to allow them to process it quickly.

Transit is actively working on initiatives to improve customer communication during emergencies; however, there are opportunities for Transit to develop and implement improved strategies, plans, and communication tools that will result in improved customer communication during emergencies and

¹³ The act of a passenger exiting a bus is called an "alighting."

severe weather. If our recommendations are implemented, Transit will be in a position to achieve its emergency communication objectives in a more cost-effective manner and customers will have better access to information where and when they need it.

This chapter is a summary of a more in-depth report. For more detailed explanations of concepts, findings and recommendations, please review *Technical Report F: Ridership Data and Communication*.

Summary of Findings

New Technologies Provide Opportunities for Better Data Analysis

Transit is currently transitioning from older ridership data systems to new fare system and an onboard ridership data system. In general, we found that Transit's use of this data is timely and automated and will likely become more so with the full implementation of the new systems. However, Transit has not yet developed detailed plans for integrating new sources of data with their existing data processing tools or data streams.

Although Transit completed a snow after-action report and received significant customer feedback during the snow event, Transit's strategic plan does not include elements of strategic planning related to effective communication with customers during emergencies and there is little feedback solicited from customers on this issue. Transit has been developing a prioritized plan of customer communication applications, but according to agency managers, other priorities have diverted planning and analytical resources. While progress in implementing new communication methods or processes has occurred at Transit, effectively communicating with customers will increasingly require them to provide information that is more user-centric and delivered via e-mail, text messages, or through a Web site.

Summary of Recommendations

Transit should develop a detailed plan and timeline for integrating new data sources with their existing data.

Transit should improve its customer communications during emergencies. These efforts should include specific communication goals in the upcoming strategic plan update, a prioritized implementation plan, and redesigned communication media.

Transit Has Not Yet Thoroughly Planned for Integrating Data

Detailed Plans for Integrating New Data Systems Should Be Developed

Transit plans to roll out new Automatic Passenger Counter (APC) and Automated Vehicle Location (AVL) systems beginning 2010. The new systems will ensure that passenger counts and vehicle location data will be integrated onboard the buses and create a single integrated data stream. However, Transit has not yet developed detailed plans for integrating these new sources of data with their existing data.

RECOMMENDATION F1

Transit should develop a detailed implementation plan and timeline for integrating new onboard and central communications systems (OBS/CCS) data with their existing data processing tools and data streams as the new system comes online.

There Are Opportunities to Improve Customer Communications During Emergencies

Transit's Ability for Real-Time Communication May Still Be Years Away

In the winter of 2008-2009, snow and ice created dangerous road conditions impacting Transit operations. Transit customers expressed frustration about Transit's inability to communicate accurate and up-to-date information about bus service. For example, customers had difficulty finding critical weather-related information online. Information was not available on snow

reroutes, and Transit's call center was only able to answer 21 percent of calls received. Transit reports that the snow event and subsequent after-action report were an intense learning process and acknowledges that there were gaps in communication and that they were not able to meet customers' emergency communication expectations.

The Baldrige National Quality Program notes that organizations should have strategic plans and objectives that focus on core competencies and results that matter to customers. Neither Transit's Comprehensive Plan for Public Transportation nor Transit's Ten-Year (2007-2016) Strategic Plan for Public Transportation currently include specific objectives or metrics related to customer emergency communication. Without specific objectives and metrics, Transit is not in a position to know whether it is successfully communicating with customers or able to prioritize potential communication improvement projects to ensure that such objectives are achieved.

**Partnering With Third
Party Developers
Brings Opportunities
and Risks**

Opportunities exist for Transit to provide additional customer communication tools economically by partnering with application developers outside the agency. Collaborating with organizations or individuals outside the agency who develop communication applications related to customer information is an area where Transit could leverage agency resources by providing transit data on schedules, routes, and other information so third party developers could build tools and applications useful to Transit's customers.

Transit has been developing a prioritized plan of customer communication applications, but according to agency managers, other priorities have diverted planning and analytical resources. Much analysis remains to be done before Transit decides what direction a number of projects will take, how much they will cost,

and other variables. Transit notes that a prioritized plan is still being developed subject to staff availability and budget constraints.

**Transit's Plan for
Customer Emergency
Communication
Applications Needs
Further Analysis to
Ensure Cost-Effective
Use of Resources**

While progress in implementing new communication methods or processes has occurred at Transit, effectively communicating with customers will increasingly require them to provide information that is more user-centric and delivered via e-mail, text messages, or through a Web site. Compared to five transit peers we reviewed, however, Transit does not yet have important communication improvements in place.

RECOMMENDATION F2

Transit should continue to improve its customer communications during emergencies. Their efforts should include:

- Ensuring that the update to its strategic plan includes elements related to effective customer communication, standards for Transit's communication of changes in bus schedules or reroutes to customers, and metrics for measuring Transit's performance that include customer feedback.
- Completing analysis of the communications options and developing a prioritized implementation plan. The analysis should assess how each option would meet Transit's communications goals and the potential costs and benefits of each option.
- Updating the Web site so applications customers use during adverse weather are accessible and easy to use; implementing a route specific e-mail notification system; and finally, implementing alert information via text messaging to rider cell phones and make key Web site pages available to customers in a format compatible with mobile devices.

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APPENDICES

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SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES

Recommendation S1

Implementation Date: Ongoing

Transit should address opportunities to enhance and expand the use of planning across the organization, especially those practices which would lead to increased efficiency and revenue generation. This planning should utilize a strategic approach that includes clear problem identification, goals for outcomes, and methods to measure progress.

Estimate of Impact: This will assist Transit in achieving their goals, especially as they relate to increased efficiency and generating revenues. Implementing this recommendation will require Transit staff time.

Recommendation S2

Implementation Date: Ongoing

Transit should ensure that systematic, effective data analysis drives organizational choices. When decision-makers are determining Transit policy, Transit should provide thorough data analysis to inform deliberations.

Estimate of Impact: This will help Transit to be certain that the decisions that they are making or recommending to policy-makers are the most cost effective and would inform policy-makers' deliberations. Implementing this recommendation will require Transit staff time and potentially training costs if current staff do not have the required skill sets.

Recommendation A1

Implementation Date: 3rd Quarter 2010

Transit should create an updated version of the financial model that facilitates sensitivity analysis and has complete documentation and explicitly identified assumptions. This model should be made available to external parties such as the Office of Management and Budget and council committee staff.

Estimate of Impact: This will help Transit to be certain that the financial planning decisions that they are making or recommending to policy-makers are the most cost effective and would inform policy-makers' deliberations. Implementing this recommendation will require Transit staff time.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

Recommendation A2

Implementation Date: 3rd Quarter 2010

Transit should propose updated financial policies particularly those related to sales tax distribution and cost growth for consideration by the Regional Transit Committee and the King County Council.

Estimate of Impact: This will make financial policies more appropriate to the current environment. Implementing this recommendation will require Transit staff time.

Recommendation A3

Implementation Date: 3rd Quarter 2010

Transit should revise its assumptions to improve the accuracy of projections for capital expenditures and capital grant revenue.

Estimate of Impact: This will result in more accurate budgets and potentially more funds available for operations

Recommendation A4

Implementation Date: 3rd Quarter 2010

Transit should develop a plan for reducing the size of the Revenue Fleet Replacement Fund balance and submit the plan for council approval.

Estimate of Impact: This would result in more funds available for operations.

Recommendation A5

Implementation Date: 1st Quarter 2010

Transit should address technical issues with its economic analysis model and provide it to the auditor's office to confirm its accuracy.

Estimate of Impact: This will help Transit to be certain that the decisions that they are making or recommending to policy-makers are the most cost effective and would inform policy-makers' deliberations. Implementing this recommendation will require Transit staff time and potentially training costs if current staff do not have the required skill sets.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

Recommendation A6

Implementation Date: 4th Quarter 2010

Transit should create economic replacement analysis models to inform its vehicle replacement decisions starting with a model for the Revenue Fleet.

Estimate of Impact: This could result in savings of millions per year in capital and operating costs. Implementing this recommendation will require Transit staff time.

Recommendation A7

Implementation Date: 2011 budget proposal

If Transit wishes to continue to use Fleet Administration's replacement criteria for its Non Revenue Vehicle (NRV) Fleet, it should complete its review of Fleet Administration's operations and maintenance data. If Transit chooses not to use Fleet Administration's replacement criteria, economic replacement analysis should be used for non-revenue vehicles. Note: This recommendation is comparable to a 2006 County Vehicle Replacement performance audit recommendation.

Estimate of Impact: This could result in cost savings through more accurate determination of the point for needed replacement and will help Transit to be certain that the decisions they are making or recommending to policy-makers are the most cost effective. Implementing this recommendation will require Transit staff time.

Recommendation A8

Implementation Date: 4th Quarter 2009

In 2005 we recommended that Transit complete its comprehensive Asset Management Guidebook, including all Asset Management efforts currently underway within the division. We continue to recommend that the comprehensive Asset Management Guidebook be completed.

Estimate of Impact: This will help Transit to be certain that the capital decisions that they are making or recommending to policy-makers are the most cost effective and would inform policy-makers' deliberations. In addition, it will improve reporting to external stakeholders. Implementing this recommendation will require Transit staff time.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

Recommendation A9

Implementation Date: 4th Quarter 2010

Transit should implement a Facilities Condition Index and systemwide targets for condition ratings for the Transit Facilities Condition Report.

Estimate of Impact: This will improve allocation of resources to capital preservation and could potentially result in cost savings from better maintained facilities. Implementing this recommendation will require Transit staff time.

Recommendation A10

Implementation Date: 4th Quarter 2010

In its 2010 update to the Transit Comprehensive Plan, Transit should ensure that it fully incorporates all elements of facility master planning. This is comparable to a recommendation made in 2005.

Estimate of Impact: This will help Transit to be certain that the facility decisions that they are making or recommending to policy-makers are the most cost effective and would inform policy-makers' deliberations. Implementing this recommendation will require Transit staff time.

Recommendation A11

Implementation Date: 4th Quarter 2010

Transit and the council should consider all relevant factors, including costs, when determining an appropriate fleet replacement for the trolley buses.

Estimate of Impact: This will help Transit to be certain that the replacement decisions that they are making and recommending to policy-makers are the most cost effective and would inform policy-makers' deliberations. Choosing hybrid diesel-electric buses to replace the trolleys could result in savings of \$8.7 million per year.

Recommendation A12 a-d

Implementation Date: 4th Quarter 2010

- a. Transit should develop and propose fare policy goals to the Regional Transit Committee and King County Council that are clearly tied to Transit's strategic plan and are representative of Transit's agencywide goals and objectives. These goals should be used as a basis for making fare policy decisions.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

- b. As part of adopting fare policy goals, Transit should define and monitor a target farebox recovery ratio. This ratio should include only bus fares and bus fare related revenues divided by only bus operating expenses.
- c. Transit and policy-makers should consider further utilizing fare policy changes to generate additional revenues to assist in funding Transit operations.
- d. Transit should reintroduce senior/disabled/youth fare discounts in line with peers and peg discounted fares to base fares by specifying a percentage discount.

Estimate of Impact: This will help Transit to be certain that the fare decisions that they recommend to policy-makers achieve agency goals and would inform policy makers' deliberations. There is the potential for additional fare revenue of up to \$51 million per year. Implementing this recommendation will require Transit staff time.

Recommendation A13

Implementation Date: 3rd Quarter 2010

Transit should update and fully document the formula used to assess the City of Seattle's payment for the Downtown Seattle Ride Free Area to reflect current ridership and operating conditions including trips that are attracted by virtue of free fares. Transit and the council should then consider revising the agreement with the City of Seattle.

Estimate of Impact: This would improve the likelihood that compensation for the Downtown Seattle Ride Free Area is more representative of the cost of the service. At a minimum, policy-makers would better understand the cost of providing the Downtown Seattle Ride Free Area.

Recommendation B1 a-j

Implementation Date: 1st Quarter 2010 for plan and 1st Quarter 2012 for efficiency tools

Transit should develop a plan to implement the schedule efficiency tools related to service development in recommendations B1 a-j. The plan should identify efficiency targets and propose a timeline for putting each tool into operation.

- a. Transit should expand its set of efficiency indicators and goals as noted in *Technical Report B: Service Development, Appendix A* and use them as targets when developing schedules. These goals should be used by management to monitor the performance of the service development group and regularly communicated to decision-makers.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

- b. Transit's planned standards/guidelines document should be completed, formally adopted, and published, providing a policy guide for Transit staff and reference document for external stakeholders.
- c. Transit should develop a process and procedures for periodic global optimization of its bus system schedule. This should include reviewing and completing the deadhead matrix.
- d. Transit should employ a systematic percentile-based cycle time analysis process systemwide. This system should consider both the variation of trip times within a time period (run time) and time gaps between buses (headways) to determine a minimum round trip cycle time that can be used with confidence for scheduling purposes.
- e. Transit should utilize HASTUS' Minbus module to implement scheduling procedures that assign vehicles to service trips most efficiently.
- f. To develop the most efficient runcut, Transit's HASTUS CrewOpt module should be utilized rather than the current manual runcutting process.
- g. Transit should ensure full calibration of HASTUS to support schedule efficiency and to reduce the time required to produce schedules.
- h. Transit should develop a systematic process for ensuring that accurate costs are programmed into HASTUS and ensure that it is updated on a regular basis.
- i. Transit should maintain accurate data in HASTUS data fields, including restoring algorithm-related data fields to their intended use and creating new user-defined fields as needed for external systems; populating minimum recovery durations for each trip with performance-driven minimum recovery (using the results of cycle time analysis described in Chapter 4); and populating allowed vehicle groups for each trip.
- j. Transit should ensure that service development staff have the knowledge to fully utilize the HASTUS system.

Estimate of Impact: If these service development efficiency tools are implemented, it could result in annual savings of \$16 to \$23 million annually the year following the implementation period. This will also help Transit to be certain that the decisions that they are making or recommending to policy-makers are the most cost effective and would inform policy-makers' deliberations. Implementing this recommendation will require Transit staff time and may also require additional professional support.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

Recommendation C1

Implementation Date: 4th Quarter 2010

Transit should capture additional data and modify current data sources to aid in the analysis of the relationship of staffing levels and staffing resource utilization to performance.

Estimate of Impact: This will help Transit to be certain that the staffing decisions they are making are the most cost effective. Implementing this recommendation will require Transit staff time. Savings will come from identifying the most cost-effective mix of staffing resources to meet service objectives.

Recommendation C2

Implementation Date: For next bargaining agreement negotiations

In order to more effectively manage the costs of planned and unplanned operator leave, the following issues should be addressed:

- Transit should quantify the cost impacts of leave procedures, and the county's representatives should take these costs into consideration when negotiating the next labor agreement.
- Transit should adjust its payroll procedures so that operators who run out of sick leave do not automatically default to unpaid leave of absence in conformance with the labor agreement.
- Transit should utilize data available in HASTUS to monitor sick leave usage in accordance with the collective bargaining agreement.

Estimate of Impact: Transit can achieve cost savings or realign efforts by reducing the number of operators and by reducing the amount of time that operators are absent from their assignments. Implementing this recommendation will require Transit staff time. If sick leave usage for full-time operators were reduced by two days per year, the cost savings could be in the range of \$1 million to \$1.2 million.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

Recommendation C3

Implementation Date: 1st Quarter 2010

Transit should further investigate opportunities and incentives for more extensive use of overtime in lieu of full-time staff, when such use would be cost effective, and more extensive use of part-time operators to provide backfill in lieu of using the Extra Board.

Estimate of Impact: Savings can result from more extensive use of overtime and use of part-time operators. The extent of savings will depend on how much overtime and part-time usage can be accomplished, which will also depend on the results of labor contract negotiations.

Recommendation C4

Implementation Date: 3rd Quarter 2010

Transit and Metro Transit Police management should identify opportunities to use lower cost staffing options and implement them when they are consistent with security objectives.

Estimate of Impact: This would result in cost savings.

Recommendation C5

Implementation Date: 1st Quarter 2010

The Metro Transit Police should strengthen its staffing management practices by employing a more statistically sound approach to planning its staffing needs and by regularly updating its employee absences to reflect actual absences and backfill needs of Metro Transit Police Officers.

Estimate of Impact: This could result in cost savings. Implementing this recommendation will require Transit staff time.

Recommendation C6

Implementation Date: 3rd Quarter 2010

The Metro Transit Police should work with its employees to schedule their comp time absences and avoid the need to backfill whenever possible.

Estimate of Impact: This would result in cost savings for Transit.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

Recommendation C7

Implementation Date: 1st Quarter 2010

Transit should develop a more precise approach to calculating and charging for Sound Transit's portion of tunnel-related police costs.

Estimate of Impact: This would increase revenue recovery in the areas of overtime, supervision and command staff.

Recommendation C8

Implementation Date: 3rd Quarter 2010

Transit should develop a long-term vision and plan for the Metro Transit Police that includes a vision, goals, and objectives, as well as, measures and targets to track progress towards achieving these goals and objectives. This should be integrated with Transit's strategic plan.

Estimate of Impact: This would guide internal planning and prioritization of security activities and resource use decisions, and be used to monitor and evaluate progress towards meeting Transit's security-related goals. It would also be a tool to communicate information on goals, priorities, activities, and resource use. Implementing this recommendation will require Transit staff time.

Recommendation D1

Implementation Date: 2nd Quarter 2010

Transit should adopt a comprehensive, fully documented strategic plan and approach to address how productivity goals are to be met and should regularly reassess its paratransit productivity goal based on historical trends and the anticipated future service environment.

Estimate of Impact: Improved productivity of paratransit service could result in significant cost savings. If Access had met its 2008 productivity goal it would have resulted in \$2.8 million in savings. Implementing this recommendation will require Transit staff time.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

Recommendation D2

Implementation Date: 1st Quarter 2012

Transit should continue Access' cost containment efforts and monitor their effectiveness while expanding CAT and other alternative service programs proven to effectively offset the cost of the more expensive Access services.

Estimate of Impact: Continuing cost containment efforts resulted in net savings each year in 2008: pathway review \$477,800; travel training \$1,155,628, and CAT program up to \$1,567,712. Expanding the CAT program by 25 percent over the next two years would yield an additional \$3,287,743 in savings. Implementing this recommendation will require Transit staff time and expanding the CAT program may require additional staff.

Recommendation D3

Implementation Date: 3rd Quarter 2010

Transit should submit a plan to council detailing the potential savings and impacts on customer service if Transit adjusts paratransit service and fares to levels allowed by the ADA.

Estimate of Impact: If policy-makers choose to reduce Access services and increase fares to levels allowed by ADA, it could result in up to \$3.8 million in savings and revenue.

Recommendation D4

Implementation Date: 3rd Quarter 2010

Transit should develop a thorough staffing model that incorporates workload factors and processes, efficiency benchmarks, impacts of workload changes on staffing needs, and effects of staffing changes on Access performance.

Estimate of Impact: This will help Transit to be certain that the staffing decisions that they are making or recommending to policy-makers are the most cost effective and would inform policy-makers' deliberations. Implementing this recommendation will require Transit staff time.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

Recommendation D5

Implementation Date: 1st Quarter 2011

Transit/Access should monitor and enforce its contract incentives and penalties for a period of one year, and then re-evaluate their usefulness as a tool for improving productivity and performance.

Estimate of Impact: Contractors could improve their performance. Access could recover funds from penalties assessed.

Recommendation E1

Implementation Date: 3rd Quarter 2010

Transit should initiate a pilot program to extend the preventive maintenance interval to +600/-200 miles on a control fleet at Bellevue base.

Estimate of Impact: Transit may save maintenance resources. Implementing this recommendation will require Transit staff time.

Recommendation E2

Implementation Date: 1st Quarter 2011

Transit should track and monitor planned and unplanned vehicle maintenance work and formulate a strategic approach to manage unplanned work.

Estimate of Impact: Planned maintenance increases service reliability, reduces overtime expenditures, and supports planning for staffing levels. Implementing this recommendation will require Transit staff time.

Recommendation E3 a-c

Implementation Date: 1st Quarter 2011

- a. Transit should regularly monitor adherence to vehicle maintenance productivity standards and work to ensure consistency in the standards across bases.
- b. Transit should expand vehicle maintenance productivity standards beyond preventive maintenance inspections to other routine jobs.
- c. Transit should establish a systemwide vehicle maintenance productivity program, expanding on current productivity standards and performance measures.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

Estimate of Impact: This will help Transit to be certain that the staffing decisions they are making or recommending to policy-makers are the most cost effective and would inform policy-makers' deliberations. Implementing this recommendation will require Transit staff time. It will also help managers improve workforce productivity, identify problem areas that can be addressed with training, and enhance overall accountability.

Recommendation F1

Implementation Date: 1st Quarter of 2011

Transit should develop a detailed implementation plan and timeline for integrating new onboard and central communications systems data with their existing data processing tools and data streams as the new system comes online.

Estimate of Impact: Integration of data will provide additional useful ridership data from multiple sources to Transit's service development staff and will reduce manual effort involved in summarizing and integrating data from multiple sources for users. Implementing this recommendation will require Transit staff time.

Recommendation F2

Implementation Date: 4th Quarter 2010

Transit should continue to improve its customer communications during emergencies. Their efforts should include:

- Ensuring that the update to its strategic plan includes elements related to effective customer communication, standards for Transit's communication of changes in bus schedules or reroutes to customers, and metrics for measuring Transit's performance that include customer feedback.
- Completing analysis of the communications options and developing a prioritized implementation plan. The analysis should assess how each option would meet Transit's communications goals and the potential costs and benefits of each option.
- Updating the Web site so applications customers use during adverse weather are accessible and easy to use; implementing a route specific e-mail notification system; and finally, implementing alert information via text messaging to rider cell phones and make key Web site pages available to customers in a format compatible with mobile devices.

SUMMARY OF RECOMMENDATIONS AND IMPLEMENTATION TIMELINES (Continued)

Estimate of Impact: This will improve customer communication and help Transit to achieve larger agency goals. This could also reduce costs to Transit while providing customers with improved communication during emergencies. Implementing this recommendation will require Transit staff time.

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EXECUTIVE RESPONSE



King County

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KING COUNTY AUDITOR

SEP 09 2009

RECEIVED

September 9, 2009

Cheryle Broom
King County Auditor
King County Courthouse
516 Third Ave., Room 1033
Seattle, WA 98104

Dear Ms. Broom:

I want to thank you for the opportunity to respond to your proposed final report on the Performance Audit of Transit dated August 24, 2009. The cooperative and collaborative approach used by the audit team resulted in a generally positive experience. Many Metro Transit staff hours have been devoted to supporting the audit team and reviewing and commenting on findings and recommendations. We appreciate the quality of the audit team and their consultant experts.

As you know, Metro Transit is facing perhaps its gravest financial crisis in its history. Identifying more efficient business practices is, and will continue to be, a high priority. I am very pleased that in many cases, the audit team found that Metro Transit performs its duties with a high degree of professionalism and purpose.

I am also happy to report that Metro Transit is already moving to implement various elements of the audit recommendations. As part of my nine-point budget plan, we are proposing to use \$100 million from the Revenue Fleet Replacement Fund to sustain service over the next four years. Metro Transit planners are already working to implement initial scheduling efficiencies as early as the next service change in February, 2010, and are actively seeking training support for the enhanced scheduling tools. Metro Transit has been working throughout the year to develop and implement numerous improvements to service emergency communications before the winter season consistent with the audit recommendations. And, earlier this year, we submitted to council a proviso response that addressed fare policies and discounted fares that is consistent with several audit findings.



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EXECUTIVE RESPONSE (Continued)

Cheryle Broom
September 9, 2009
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FINDINGS AND RECOMMENDATIONS

General Overview:

The audit findings and recommendations, which touch on many areas of Metro Transit's business, have a consistent theme: that Metro Transit can and should perform more rigorous business and strategic planning to assure the most cost effective business practices are followed, whether in daily operations or longer term capital planning. At a fundamental level, we agree that a large, complex organization such as Metro Transit should maintain a robust business planning and analysis structure. These enhanced analytical "best practices" require additional skilled resources. This need was acknowledged by the audit team, and the audit report identifies the need to commit resources to comply with many of the recommendations.

However, it must be acknowledged that over the years, Metro Transit has cut back on resources that could have been devoted to non-direct service activities such as planning and analysis. As recently as the 2009 supplemental budget, positions associated with activities such as organizational development, succession planning and research and analysis were eliminated. Since 2000, a total of more than \$40 million has been eliminated from the organization in efforts to respond to economic and other factors. Given the priority to maintain and improve services, these reductions have disproportionately impacted the 'administrative' activities of the organization. Further, similar reductions will be included in my proposed 2010/11 budget.

The audit report often cites best general practices and then suggests that better, more cost effective results would follow if additional time was spent on planning and analysis. These better results were often not quantified by the audit team. In short, the audit recommends that Metro Transit invest in many enhanced practices to pursue what might be a more cost effective program. Many of these enhanced practices cannot be accomplished without additional resources or a profound shift in elements of Metro Transit's work program. My 2010/11 budget proposal will include a request for resources to implement audit recommendations. I look forward to working with council during the budget process to prioritize the resources necessary to address improvements to current planning and analysis efforts.

Service Scheduling Efficiencies

My staff was impressed with the depth and quality of the audit work in this area. We have already begun to move forward with some of the recommendations associated with scheduling efficiencies. The audit report clearly acknowledges that to fully implement the recommendations, staff will need training in advanced elements of our scheduling software, HASTUS.

EXECUTIVE RESPONSE (Continued)

Cheryle Broom
September 9, 2009
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We estimate, and your report confirms, that it will likely take two or more years to develop, implement, evaluate changes to our scheduling processes and fully realize the benefits of these recommendations. During this time we will be confirming the theoretical analyses performed by the audit team. We have serious concerns about the potential impact on service quality for our customers as well as operator job satisfaction. As a result, great care will be taken during the implementation process to strike the appropriate balance between service quality and efficiency. While we will implement some changes this coming February, until this work is further along, we cannot confirm the potential ongoing savings identified in the report. I expect that Metro Transit's planners will have a much better sense of the possibilities later next year, perhaps after the June service change.

Financial and Capital Planning

We appreciate the support for considering revisions to the financial policies and will be working with the Regional Transit Committee during 2010 to make needed revisions. With respect to the Revenue Fleet Replacement Fund, the 2010/2011 budget includes a plan to reduce reserve funds over the next 4 years to help sustain service.

We do have concerns about the recommendations for development of a comprehensive Asset Maintenance Guidebook and implementation of a Facility Condition Index. With respect to the Asset Maintenance Guidebook, we do not dispute the need for policies and practices, but rather are concerned about the redundancy with existing reporting to Washington State and the Federal Transit Administration. For the Facility Condition Index, rather than develop something that would be unique to Metro Transit we believe it would be more effective to implement emerging FTA standards associated with "state of good repair." Metro has been selected to serve on an expert panel to develop these standards. Implementing industry-consistent methods would enable comparison and benchmarking against our peers, something that an independent Facility Condition Index would not.

Accessible Services

Paratransit service is very expensive to operate, so finding savings is something that we are always pursuing, which was confirmed by the audit. The audit acknowledges that Metro Transit has successfully concentrated on multiple, industry-leading cost containment efforts aimed at "mainstreaming" people who might be Access eligible but could use bus service. Similarly, our Community Access Transportation (CAT) program is acknowledged by the audit team as being a cost-effective alternative to paratransit service. These programs combined are yielding more than \$3 million in annual savings. Increasing productivity, generally measured as "passengers per hour," has been and will continue to be a focus of management attention. However, we must avoid creating planned trips for Access customers that are too long and arduous in an effort to increase passengers per hour through more aggressive group riding.

EXECUTIVE RESPONSE (Continued)

Cheryle Broom
September 9, 2009
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Trolley Replacement

Metro Transit is currently planning to replace the existing trolley fleets in the 2013-2014 timeframe. Prior to developing a recommendation regarding the replacement of this fleet, Metro Transit will complete a comprehensive review and analysis. While this will include fleet and infrastructure life cycle cost and economic replacement analyses, it will also consider the environmental factors that are associated with the operation of this fleet, including of zero emissions and quiet vehicles. In light of the costs as well as the history of trolley service in the City of Seattle, reaching a decision on trolley replacement will have to be approached with great care and consideration.

Fare Strategies

The audit makes a number of important observations about Metro Transit's fares and fare policies. Metro Transit's fare system is complex and has over the years evolved to accommodate many specific policy, market and rider interests. As a result, Metro Transit's fares are complicated and provide a number of deep discounts. Many of the proposals made in the audit would increase fares for various different user groups including youth, seniors, people with disabilities and customers who must transfer to complete their transit trips. It therefore comes as no surprise that opportunities exist to generate additional farebox revenue by increasing the price of transit trips for all Metro Transit customers.

I agree with the audit finding that where and how such fare increases are implemented must be accomplished in the context of a clear set of policy objectives that align fare policy with revenue, ridership and equity considerations. Further, I believe it is time to simplify Metro Transit's fare policies and make maximum use of the new ORCA smart card technology. For this reason, I recommend that the Executive, Council and Regional Transit Committee convene a joint effort in 2010, in collaboration with our regional transit partners, to study fare policy with the aim of improving our fare structure.

I have mentioned only a few areas of the audit report. The attached matrix provides our feedback on each of the 34 recommendations contained in the document.

Again, I want to thank you for the opportunity to respond to the draft audit report and to commend both your audit team as well as Metro Transit staff for their work on this audit.

EXECUTIVE RESPONSE (Continued)

Cheryle Broom
September 9, 2009
Page 5

If you have any questions, please contact Kevin Desmond, General Manager, Metro Transit Division, at 206-684-1619.

Sincerely,


Kurt Triplett
King County Executive

Enclosure

cc: Harold S. Taniguchi, Director, Department of Transportation (DOT)
Laurie Brown, Deputy Director, (DOT)
Caroline McShane, Deputy Director, Finance and Business Operations
Beth Goldberg, Deputy Director, Office of Management and Budget

Attachment –Performance Audit of Transit-Response Matrix

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>S1: Transit should address opportunities to enhance and expand the use of planning across the organization, especially those practices which would lead to increased efficiency and revenue generation. This planning should utilize a strategic approach that includes clear problem identification, goals for outcomes, and methods to measure progress.</p>	<p>Concur</p>	<p>Ongoing</p>	<p>This recommendation outlines a process rather than a specific deliverable. Revising business processes will require commitment of resources that have been depleted over the past several years.</p>
<p>S2: Transit should ensure that systematic, effective data analysis drives operational choices. When decision-makers are determining Transit policy, Transit should provide thorough data analysis to inform deliberations.</p>	<p>Concur</p>	<p>Ongoing</p>	<p>This recommendation outlines a process rather than a specific deliverable. Revising business processes will require commitment of resources that have been depleted over the past several years. We believe that we have been very responsive to RTC and Council policy review requests.</p>
<p>A1: Transit should create an updated version of the financial model that facilitates sensitivity analysis and has complete documentation and explicitly</p>	<p>Concur</p>	<p>3rd Quarter 2011 for use with the 2012/2013 biennial budget.</p>	<p>A revised model will be developed.</p>

EXECUTIVE RESPONSE (Continued)

EXECUTIVE RESPONSE (Continued)

Attachment –Performance Audit of Transit-Response Matrix

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>identified assumptions. This model should be made available to external parties such as the Office of Management and Budget (OMB) and Council committee staff.</p>			
<p>A2: Transit should propose updated financial policies, particularly those related to sales tax distribution and cost growth for consideration by the Regional Transit Committee and the King County Council.</p>	Concur	Propose in 3Q 2010	<p>Proposed changes will be submitted to the Regional Transit Committee (RTC). Implementation of changes will be dependent on RTC action.</p>
<p>A3: Transit should revise its assumptions to improve the accuracy of projections for capital expenditures and capital grant revenue.</p>	Concur	<p>3rd Quarter 2011 for use in the 2012/2013 biennial budget</p>	<p>This is an ongoing effort with steps taken annually to evaluate and revise the projections. A revised approach to estimating project under expenditures will be reflected in the 2010/2011 proposed budget. Grants are exclusively reimbursements, so future awards are dependent on the availability of eligible project costs. As evidenced with the 2010/2011 proposed budget, grant awards are increased commensurate with new project costs. Similarly when capital expenditures are not incurred in a given year, projected grant revenue will not be received. Additional refinements will be implemented for the 2012/2013 biennial budget.</p>

EXECUTIVE RESPONSE (Continued)

Attachment –Performance Audit of Transit-Response Matrix

Recommendation	Agency Position	Schedule for Implementation	Comments
A4: Transit should develop a plan for reducing the size of the Revenue Fleet Replacement Fund balance and submit the plan for Council approval.	Concur	3 rd Quarter 2010 (with other financial policies above)	While questions remain about the implications of the auditors calculations (e.g. does this change the fund to a 'pay as you go' model), the 2010/2011 budget will include a reduction in the fund balances held in the RFRF. New methodology/policy will be developed and proposed.
A5: Transit should address technical issues with its economic analysis model and provide it to the Auditor's Office to confirm its accuracy.	Concur	1 st Quarter 2010	The majority of the issues revolved around the use of inflated cost and revenue estimates. As acknowledged by the audit team, when inflation is included in the underlying numbers, the discount rate needs to be revised to reflect inflation as well. This will be more clearly documented in future analyses. Use of life cycle costing has been expanded within Transit over the past two years. As more project managers utilize this approach, we need to continue to provide education on the proper use of the tool.
A6: Transit should create economic replacement analysis model to inform its vehicle replacement decisions, starting with a model for the Revenue Fleet.	Concur	4 th Quarter 2010	Transit's Finance and Budget group will establish a framework and work with each group to create economic replacement and lifecycle cost models associated with each type of revenue fleet purchased. The purpose of the framework/models will be to inform both the timing as well as alternatives for replacement.
A7: If Transit wishes to continue to use	Concur	2012/2013 biennial budget proposal	This recommendation from earlier audits was delayed while Fleet Administration provided their

Attachment –Performance Audit of Transit-Response Matrix

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>Fleet Administration's replacement criteria for its Non Revenue Vehicle (NRV) Fleet, it should complete its review of Fleet Administration's operations and maintenance data. If Transit chooses not to use Fleet Administration's replacement criteria, economic replacement analysis should be used for non-revenue vehicles.</p> <p>Note: This recommendation is comparable to the 2006 County Vehicle Replacement performance audit recommendation.</p>	<p>Do not concur</p>	<p>2nd Quarter 2010</p>	<p>model. Fleet's model is currently being evaluated. If it is determined that replacement criteria will be revised, changes will be incorporated into the 2012/2013 biennial budget.</p>
<p>A8: In 2005 we recommended that Transit complete its comprehensive Asset Management Guidebook, including all Asset Management efforts currently underway within the division. We continue to recommend that the comprehensive Asset Management Guidebook be completed.</p>	<p>Do not concur</p>	<p>2nd Quarter 2010</p>	<p>Transit currently complies with both Washington State and Federal requirements for asset maintenance and will continue this compliance. Compliance is evidenced by the fact that the Asset Maintenance information provided to Washington State has been certified more than once and our programs have been recognized as models for others during routine FTA Triennial audits. In addition, Metro Transit staff are actively involved in a Federal Transit Administration working group which is defining</p>

EXECUTIVE RESPONSE (Continued)

EXECUTIVE RESPONSE (Continued)

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>A9: Transit should implement a Facilities Condition Index and system wide targets for condition ratings for the Transit Facilities Condition Report.</p>	<p>Do not concur</p>	<p>4th Quarter 2010 ; dependent upon FTA process</p>	<p>Creation of a stand alone Asset Management Guidebook has limited value to the organization and is likely to be redundant with State and Federal reporting.</p> <p>As mentioned in A8 above, Metro Transit staff are participating in an effort led by the Federal Transit Administration to develop 'state of good repair' standards for the transit industry. As these standards will likely become a reporting and audit requirement for the FTA, Metro Transit's adherence may be required. Implementation of the audit recommendation on top of this would be duplicative and could require more resources.</p>
<p>A10: In its 2010 update to the Transit Comprehensive Plan, Transit should ensure that it fully incorporates all</p>	<p>Concur</p>	<p>4th Quarter 2010 (or with Comprehensive Plan review and adoption schedule)</p>	

Attachment –Performance Audit of Transit-Response Matrix

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>elements of facility master planning. This is comparable to a recommendation made in 2005.</p>			
<p>A11: Transit and the Council should consider all relevant factors, including costs, when determining an appropriate fleet replacement for the trolley buses.</p>	Concur	<p>The later of 2nd Quarter 2011 or by the time that a decision is required to meet fleet procurement requirements.</p>	<p>The model provided needs to be modified to reflect industry standard useful lives for alternative vehicles and to include environmental factors such as emissions and noise impacts. Transit will perform a full scale review in advance of Trolley retirement and procurement.</p>
<p>12a: Transit should develop and propose fare policy goals to the Regional Transit Committee and King County Council that are clearly tied to Transit's strategic plan and are representative of Transit's agency wide goals and objectives. These goals should be used as a basis for making fare policy decisions.</p>	Concur	4 th Quarter 2010	<p>Transit agrees that a full review should be undertaken to align fare policy with revenue, ridership and equity considerations and that our fare policy can be simplified. Will be recommending that the Council and the RTC convene a joint effort with our regional partners to study fare policy with an aim of reforming our fare structure. Transit notes that, while perhaps not in the form of policy goals, adopted fare policies do exist.</p>
<p>12b: As part of adopting fare policy goals, Transit should define and monitor a target farebox recovery ratio. This ratio should include only bus fares</p>	Concur	4 th Quarter 2010	<p>Historic ratios will not be comparable. Financial policies will also need to be modified to reflect this change.</p>

EXECUTIVE RESPONSE (Continued)

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Attachment –Performance Audit of Transit-Response Matrix

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>and bus fare related revenues divided by only bus operating expenses.</p> <p>12c: Transit and policy makers should consider further utilizing fare policy changes to generate additional revenues to assist in funding Transit operations.</p>	Concur	4 th Quarter 2010	<p>Transit agrees that a full review should be undertaken to align fare policy with revenue, ridership and equity considerations and that our fare policy can be simplified. Will be recommending that the Council and the RTC convene a joint effort with our regional partners to study fare policy with an aim of reforming our fare structure.</p>
<p>12d: Transit should reintroduce senior/disabled/youth fare discounts in line with peers and peg discounted fares to base fares by specifying a percentage discount.</p>	Concur	Completed	<p>Transit has proposed changes to these discounts as required per Ordinance # 16310; Section 4; proviso # 3. At this point, implementation is dependent on actions by policy makers.</p>
<p>A13: Transit should update and fully document the formula used to assess the City of Seattle's payment for the Downtown Seattle Ride Free Area to reflect current ridership and operating conditions including trips that are attracted by virtue of free fares. Transit and the Council should then consider revising the agreement with the City of</p>	Concur	3 rd Quarter 2010	<p>Efforts to evaluate and/or revise the methodology will need to be done in cooperation with the City of Seattle. Resources will be required to conduct additional research to support revising the existing methodology.</p>

EXECUTIVE RESPONSE (Continued)

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>Seattle.</p> <p>B1 a-j: Transit should develop a plan to implement the schedule efficiency tools related to service development in recommendations B1 a-j. The plan should identify efficiency targets and propose a timeline for putting each tool into operation.</p>	<p>See a-j below</p>	<p>1st Quarter 2010 for plan and 1st Quarter 2012 for efficiency tools (see dates for individual recommendations a-j below)</p>	<p>See a-j below</p>
<p>a. Transit should expand its set of efficiency indicators as noted in Technical Report B: Service Development, Appendix A and goals and use them as targets when developing schedules. These goals should be used by management to monitor the performance of the service development group and regularly communicated to decision makers.</p>	<p>Concur</p>	<p>3rd Quarter 2010 although some elements can be implemented sooner</p>	<p>All of the metrics can be assembled and reported on for each service change using existing data sources. Transit agrees that using these types of cost efficiency metrics have not taken priority over other metrics that focus more on customer satisfaction in making service decisions. More frequent review of these types of metrics may result in some different decision-making with regard to future service decisions.</p>
<p>b. Transit's planned standards/guidelines document should be completed, formally adopted, and</p>	<p>Concur</p>	<p>2nd Quarter 2011</p>	<p>Transit believes that the consolidation of identified service and passenger facility standards, best practices, and service guidelines used by planners and schedulers should be</p>

EXECUTIVE RESPONSE (Continued)

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>published, providing a policy guide for Transit staff and reference document for external stakeholders.</p>			<p>consolidated into one single document. Transit believes that this would strengthen the system development processes, promote consistency, and improve outcomes. Transit also agrees that a standards and guidelines document would improve stakeholder awareness of design tradeoffs, and improve the accountability and transparency of the planning and decision making process.</p> <p>As the Audit describes, Transit was about to offer an update of the 10 Year Strategic Plan for Public Transportation when the national recession changed the conditions that were the basis of the update. The draft update included a work program action to develop a service and facility guidelines document by 2011. This document would compile existing guidance and engineering standards for transit service and facilities, and where existing guidance was missing or obsolete, prepare new guidance based on industry best practices and input from stakeholders.</p>
<p>c. Transit should develop a process and procedures for periodic global optimization of its bus system schedule. This should include reviewing and completing the</p>	<p>Concur</p>	<p>Initiate 3rd Quarter 2010 and continue with each service change thereafter</p>	<p>While Transit essentially agrees with the recommendation concerns exist with some of the assumptions that support the recommendation. Transit agrees that more can and will be done to review the potential for finding new scheduling efficiencies in the system by performing routine global optimization efforts.</p>

EXECUTIVE RESPONSE (Continued)

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Recommendation	Agency Position	Schedule for Implementation	Comments
<p>deadhead matrix.</p>			<p>The audit correctly notes that Transit already makes great use of "interlining" to more cost effectively deliver transit service. More recently, Transit has identified some of these interlined services as some of their worst performers in "on time performance", so Transit is hesitant to assume that there are many more efficient interlines available that will produce efficiencies without the sacrifice of poorer "on time" performance.</p> <p>Transit disagrees that the decision-making process behind placing routes at various bases is "mostly manual", as there is a good deal of both careful thought and base capacity modeling that goes into the proper distribution of both service and buses to the 7 transit bases. Transit also is obliged to point out that there are added operational costs not mentioned in this audit document that come from running routes out of multiple bases (something that might occur more frequently with this proposed approach). These costs include, but are not limited to, training operators so that they qualify on more routes and providing the right vehicle mix to maintain system flexibility and meet service needs.</p> <p>Nonetheless, Transit agrees that using its scheduling software to more powerfully review the proper placement of routes is an effort that should be undertaken. This includes reviewing and updating the deadhead matrix (something</p>

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Recommendation	Agency Position	Schedule for Implementation	Comments
<p>d. Transit should employ a systematic percentile-based cycle time analysis process system-wide. This system should consider both the variation of trip times within a time period (runtime) and time gaps between busses (headways) to determine a minimum round trip cycle time that can be used with confidence for scheduling purposes.</p>	<p>Concur with caution</p>	<p>Initially in February 2010 and continuing with service changes thereafter.</p>	<p>Transit is already beginning to do in light of preliminary audit findings).</p> <p>As the auditor suggests, using Cycle Time Analysis will result in shorter "layover"/"recovery" times for Operators. It follows that the use of Cycle Time Analysis will result in cultural change for Operators, and it may also impact customers' perceptions of the timeliness of transit service.</p> <p>While the audit team consistently suggested that a transit agency must determine for itself whether using a 90th and 95th percentile approach to cycle time analysis (because either is appropriate) all of the costing/savings estimates used in the audit report are based on the more aggressive, 90th percentile approach.</p> <p>Since, as the audit points out, Transit's current layover to in service ratios are not in line with other transit agencies mentioned in the report, using the 90th percentile approach is likely to be more problematic to some of Transit's operators, and customers as well. Transit is concerned that the use of Cycle Time could produce transit schedules that are far less convenient for customers. By shifting the scheduled arrival and departure times of transit trips, Cycle Time Analysis could introduce more risk of loss of ridership as some customers find it increasingly difficult to transfer and make their needed</p>

EXECUTIVE RESPONSE (Continued)

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Recommendation	Agency Position	Schedule for Implementation	Comments
e. Transit should utilize HASTUS' Minibus module to implement scheduling procedures that assign vehicles to service trips most efficiently.	Concur	Initially in February 2010 and continuing with service changes thereafter.	This may lead to more efficient use of resources; however, costs of operator qualification must be included via a parameter or calculated separately to adequately address total costs. Scheduled costs alone are not the only agency cost. Once Minibus is functioning, a parameter needs to be added to prevent the program from assuming no operator cost in relocating a trip.
f. To develop the most efficient run cut, Transit's HASTUS CrewOpt module should be utilized rather than the current manual runcutting process.	Concur	Initially in February 2010 and continuing with service changes thereafter.	
g. Transit should ensure full calibration of HASTUS to support schedule efficiency and to reduce the time required to produce schedules.	Concur	Initially in February 2010 and continuing with service changes thereafter.	Consistent with responses to recommendations B1e and B1f, Metro agrees that along with using Minibus and CrewOpt tools, they must also be calibrated to produce useful results.
h. Transit should develop a systematic process for ensuring that accurate costs are programmed into HASTUS and ensure that it is updated on a regular basis.	Concur	4 th Quarter 2009	

EXECUTIVE RESPONSE (Continued)

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>i. Transit should maintain accurate data in HASTUS data fields, including restoring algorithm-related data fields to their intended use and creating new user-defined fields as needed for external systems; populating minimum recovery durations for each trip with performance-driven minimum recovery (using the results of cycle time analysis described in Chapter 4); and populating allowed vehicle groups for each trip.</p>	<p>Concur</p>	<p>3rd Quarter 2010</p>	<p>As Schedulers begin to train and effectively use Minibus (per recommendations B1e and B1g), populating these fields becomes a necessary requirement for getting the best scheduling results.</p>
<p>j. Transit should ensure that Service Development staff have the knowledge to fully utilize the HASTUS system.</p>	<p>Concur</p>	<p>Initially in February 2010 and continuing with service changes thereafter.</p>	
<p>C1: Transit should capture additional data and modify current data sources to aid in the analysis of the relationship of staffing levels and staffing resource utilization to performance.</p>	<p>Concur</p>	<p>4th Quarter 2010</p>	<p>We will outline specific activities associated with implementing this recommendation. Any resolution of this recommendation will likely be subject to collective bargaining.</p>
<p>C2: In order to more effectively</p>	<p>Concur</p>	<p>For next bargaining agreement negotiations -</p>	

EXECUTIVE RESPONSE (Continued)

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Recommendation	Agency Position	Schedule for Implementation	Comments
<p>manage the costs of planned and unplanned operator leave, the following issues should be addressed:</p> <ul style="list-style-type: none"> • Transit should quantify the cost impacts of leave procedures, and the county's representatives should take these costs into consideration when negotiating the next labor agreement. • Transit should adjust its payroll procedures so that operators who run out of sick leave do not automatically default to unpaid leave of absence in conformance with the labor agreement; and • Transit should utilize data available in HASTUS to monitor sick leave usage in accordance with the collective bargaining agreement. 		<p>contract expires October 2010</p>	

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>C3: Transit should further investigate opportunities and incentives for more extensive use of overtime in lieu of full-time staff, when such use would be cost-effective, and more extensive use of part-time operators to provide backfill in lieu of using the Extra Board.</p>	<p>Concur</p>	<p>For next bargaining agreement negotiations – contract expires October 2010</p>	<p>This will become part of the objectives for 2010 labor negotiations.</p>
<p>C4: Transit and Metro Transit Police management should identify opportunities to use lower cost staffing options and implement them when they are consistent with security objectives.</p>	<p>Concur</p>	<p>3rd Quarter 2010</p>	<p>Metro Transit Police will continue to examine shared cost models, particularly with the ST transit police unit. In addition, any future procurement of contract security services will consider this recommendation.</p>
<p>C5: The Metro Transit Police should strengthen its staffing management practices by employing a more statistically sound approach to planning its staffing needs and by regularly updating its employee absences to reflect actual absences and backfill</p>	<p>Concur</p>	<p>1st Quarter 2010</p>	<p>The KOSO Contracting Unit will conduct a test of the MTP staffing plan using an analysis that reflects actual absences and backfill needs of Metro Transit Police Officers. The results of this work will determine the need to modify staffing practices.</p>

EXECUTIVE RESPONSE (Continued)

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Recommendation	Agency Position	Schedule for Implementation	Comments
needs of Transit Police Officers.			
C6: The Metro Transit Police should work with its employees to schedule their comp time absences and avoid the need to backfill whenever possible.	Concur within constraints of the labor agreement	3rd Quarter 2010	The KCSO will examine the amount of backfill required in recent months, work with Sergeants to review comp time rules, provide training as appropriate, and then measure the amount of MTP backfill required due to comp time in a similar period in 2010. Efficiencies associated with this recommendation may be constrained by the labor agreement which states that backfill cost is not an allowable reason for management to deny comp time.
C7: Transit should develop a more precise approach to calculating and charging for Sound Transit's portion of tunnel-related police costs.	Concur	1 st Quarter 2010	KCSO will track DSTT police responses for a 3 month period and determine if MTP's current method of calculating and charging for DSTT police costs needs adjustment.
C8: Transit should develop a long term vision and plan for the Metro Transit Police that includes a vision, goals and objectives, as well as measures and targets to track progress towards achieving these goals and objectives. This should be integrated with Transit's	Concur	3 rd Quarter 2010	As part of the KCSO, Special Operations Division, the Metro Transit Police share the KCSO's vision statement and are regularly required to identify and track progress on a myriad of department and division goals and objectives. Within Metro Transit Police, there are additional goals and objectives that are monitored and tracked. Transit will review the KCSO's vision statement in the context of Transit's System Safety and Security Plan to

EXECUTIVE RESPONSE (Continued)

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Recommendation	Agency Position	Schedule for Implementation	Comments
strategic plan.			ensure consistency, and make changes as necessary.
D1: Transit should adopt a comprehensive, fully documented strategic plan and approach to address how productivity goals are to be met and should regularly reassess its paratransit productivity goal, based on historical trends and the anticipated future service environment.	Concur	2 nd Quarter 2010	Transit concurs with the recommendation, however, the underlying cost savings may be overstated. We have taken steps to begin this work. An evaluation of the cost savings will be included in our analysis.
D2: Transit should continue Access' cost containment efforts and monitor their effectiveness while expanding CAT and other alternative service programs proven to effectively offset the cost of the more expensive Access services.	Concur	1 st Quarter 2012	Transit concurs with the recommendation; however, as was pointed out during the technical review, the savings associated with this recommendation may be overstated. We will be including an evaluation of these impacts in our analysis.
D3: Transit should submit a plan to Council detailing the potential savings and impacts on customer service if Transit adjusts paratransit service and	Partially Concur	3 rd Quarter 2010	While we generally concur with this recommendation more information is required on the implications of Washington State law (WAC 162-26-070) associated with fare levels. One ruling has indicated that raising the fare for Access service to the level suggested by the

EXECUTIVE RESPONSE (Continued)

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Recommendation	Agency Position	Schedule for Implementation	Comments
fares to levels allowed by the ADA.			audit team may not be legal.
D4: Transit should develop a thorough staffing model that incorporates workload factors and processes, efficiency benchmarks, impacts of workload changes on staffing needs, and effects of staffing changes on Access performance.	Concur	3 rd Quarter 2010	
D5: Transit/Access should monitor and enforce its contract incentives and penalties for a period of one year, and then re-evaluate their usefulness as a tool for improving productivity and performance.	Concur	1 st Quarter 2011	
E1: Transit should initiate a pilot program to extend the preventive maintenance interval to +600/-200 miles on a control fleet at Bellevue Base.	Concur	3 rd Quarter 2010 initiate; evaluation of impacts may require up to 3 years to fully assess.	Changing the window from +/-400 miles for performing preventative maintenance to +600/-200 miles for a single base can be accomplished; however, it may be necessary to choose an alternative base in order to determine the effects on a broader spectrum of the fleets and service type. In order to determine the

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Recommendation	Agency Position	Schedule for Implementation	Comments
<p>E2: Transit should track and monitor planned and unplanned vehicle maintenance work and formulate a strategic approach to manage unplanned work.</p>	<p>Concur</p>	<p>1st Quarter 2011</p>	<p>longer term effects on both preventative maintenance and reactive repairs resulting from this change will probably take at least three years as there will only be a marginal change (less than 1 inspection per bus) in the number of inspections performed annually.</p> <p>VM recognizes the value of monitoring unplanned work. The existing coding structure in M5 (VM maintenance mgmt system) was designed to identify the source of the work but was not intended to track and report the manner in which it was performed (planned v/s unplanned). The auditor and KCM agreed that the percentages of planned versus unplanned work is different than what is portrayed in the raw data. To more clearly report the differences, VM will establish a basis for identifying planned v/s unplanned work within the M5 structure and create standards against the definition.</p> <p>Transit will develop a plan for implementing this recommendation.</p>
<p>E-3: a. Transit should regularly monitor adherence to vehicle maintenance productivity standards and work to ensure consistency in the standards</p>	<p>Concur</p>	<p>1st Quarter 2011</p>	<p>VM has already begun the process of establishing productivity standards. 533 performance standards already exist for PMIs and defined standard preventive maintenance jobs. With increased resources, VM could expand the use of standards to routine repairs not already included in the preventive</p>

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Recommendation	Agency Position	Schedule for Implementation	Comments
<p>across bases</p> <p>b: Transit should expand vehicle maintenance productivity standards beyond preventive maintenance inspections (PMIs) to other routine jobs.</p> <p>c: Transit should establish a system-wide vehicle maintenance productivity program, expanding on current productivity standards and performance measures.</p>	<p>Concur – in place</p>	<p>Ongoing and with system implementations in 2010-2012</p>	<p>maintenance program. It is anticipated that this could create between 3,000 and 5000 additional standards to review, prioritize, analyze, establish, report on, and monitor.</p> <p>Transit will develop an implementation plan for this recommendation.</p>
<p>F1: Transit should develop a detailed implementation plan and timeline for integrating new on-board and central communications systems (OBS/CCS) data with the existing data processing tools and data streams as the new system comes online.</p>	<p>Concur</p>	<p>4th Quarter 2010 (all elements; some may be implemented sooner)</p>	<p>Detailed implementation plans and timelines are updated on an ongoing basis noting the interdependencies between the systems data. As designed, the new systems will enhance the data available for analysis.</p>
<p>F2: Transit should continue to improve its customer communications during emergencies. Their efforts should</p>	<p>Concur</p>	<p>4th Quarter 2010 (all elements; some may be implemented sooner)</p>	<p>Metro's "After Action Report" issued 2/6/09 following last winter's unusual snow storms identifies many of the actions being recommended by the audit. Consequently,</p>

EXECUTIVE RESPONSE (Continued)

Recommendation	Agency Position	Schedule for Implementation	Comments
<p>include:</p> <ul style="list-style-type: none"> a. Ensuring that the update to its strategic plan includes elements related to effective customer communication, standards for Transit's communication of changes in bus schedules or reroutes to customers, and metrics for measuring Transit's performance that include customer feedback. b. Completing analysis of the communications options and developing a prioritized implementation plan. The analysis should assess how each option would meet Transit's communications goals and the potential costs and benefits of each option. c. Updating the website so 			<p>many of the improvements are already underway or planned for the upcoming winter season. Other elements noted by the auditors will require more time and technical resources to develop, whether directly by Metro or in partnership with application developers. We agree that the strategic plan should reference effective public and customer communications during emergencies.</p>

EXECUTIVE RESPONSE (Continued)

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applications customer use during adverse weather are accessible and easy to use; implement a route specific e-mail notification system; and finally, implement alter information via text messaging to rider cell phones and make key website pages available to customer in a format compatible with mobile devices.			

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AUDITOR'S COMMENTS TO EXECUTIVE RESPONSE

Implementation of all the recommendations in this performance audit is important to ensure that Transit operates in the most cost-effective manner while balancing policy priorities. The executive's response to this audit acknowledged that several of the recommendations made by the auditors can result in significant operational efficiencies, service improvements, revenue enhancements, and other positive outcomes.

We recommend that Transit complete a comprehensive Asset Management Guidebook in order to assemble and fully develop their asset management practices. The executive did not concur with this approach, stating that they comply with Washington State and Federal requirements for asset maintenance. As we note in our report, Transit concurred with this recommendation when issued in our 2005 performance audit and again in our 2007 follow-up review. The intent of the recommendation was not to meet guidelines, but rather to develop an asset management product that would embody asset management practices – as envisioned by the state Blue Ribbon Commission on Transportation. Such a comprehensive document could be excerpted for different reporting requirements. We continue to recommend that Transit complete its guidebook.

We also recommend that Transit implement a Facility Condition Index and targets for condition ratings for their Transit Facilities Condition Report. The executive does not concur with this approach, stating that they are participating in a FTA working group. Audit team is open to a different approach for setting goals for and measuring the progress of Transit's facility preservation activities. However, we point out that since Transit already regularly evaluates the condition of its facilities, the implementation of a facilities condition index would take little additional effort. In addition, Transit has not indicated an implementation timeline for the results of the FTA working group effort. Without implementing our recommendation, Transit will continue to lack goals and tools for tracking progress into the future.

We recommend that Transit submit a plan to council detailing the potential savings and impacts on customer service if Transit were to meet, rather than exceed, ADA requirements. The executive partially concurs with this recommendation, while expressing concern that a paratransit fare increase may not be legal. However, the ruling cited by Transit as the basis for this assertion was made 27 years ago, prior to the federal enactment of ADA laws and in circumstances that are not comparable to Transit's. If Transit continues to have concerns about the legality of paratransit fares, those concerns should be resolved through consultation with the Prosecuting Attorney's Office before Transit submits its plan to the council in 2010.

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