Final Report

Contract Number: DTFH61-96-C-00077
Task Number: BA7744

Evaluation of the Central Puget Sound Regional Fare Coordination Project

Prepared for:

U.S. Department of Transportation
ITS Joint Program Office, HOIT-1
Washington, DC 20590

By:

Battelle
and
CRA International

April 13, 2006

Battelle
The Business of Innovation

CRA

Quality Assurance Statement

The Federal Highway Administration provides high-quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle **Evaluation of the Central Puget Sound Regional Fare Coordination Project**		5. Report Date: April 13, 2006 6. Performing Organization Code
7. Author(s) Chris Cluett, Jon Bottom, Patrick Balducci, Catherine Taylor		8. Performing Organization Report No.
9. Performing Organizations Name and Address Battelle 1100 Dexter Avenue North Suite 400 Seattle, WA 98109-3598 CRA International John Hancock Tower 200 Clarendon Street, T-33 Boston, MA 02116-5092		10. Work Unit No. (TRAIS) 11. Contract or Grant No. DTFH61-96-C-00077
12. Sponsoring Agency Name and Address Federal Highway Administration, HOTO 400 Seventh Street, SW Washington, DC 20590		13. Type of Report and Period Covered Final, February 2003 – July 2005 14. Sponsoring Agency Code
15. Supplementary Notes: Contracting Officer's Technical Representative (COTR) – Joe Peters, FHWA		

16. Abstract

The Central Puget Sound Region in western Washington State covers over six thousand square miles and a population of 3.5 million persons. Seven public transportation agencies, operating bus, rail, and ferry services in four counties in this region, are partnering to offer their public transportation customers a single electronic fare medium – a *fare card* – that will enable seamless travel across the region using multiple transportation service providers. The Regional Fare Coordination (RFC) Project partners currently include: King County Metro Transit (the largest agency), Community Transit, Everett Transit, Kitsap Transit, Pierce Transit, Sound Transit and the Washington State Ferries. The Federal Highway Administration (FHWA) of the U.S. Department of Transportation (USDOT) contracted with Battelle to evaluate the RFC Project. The FHWA sees great value for other locations and agencies in documenting the processes that have been followed by the partners and the strategies that they have applied to address institutional, technical, organizational, governance, financial, contractual, and other challenges. Battelle, teamed with CRA International (CRA), has conducted interviews with representatives of each partner agency, as well as with the staff of the Regional Team that is responsible for administering the vendor contract and overseeing the complex day-to-day system development process. The RFC Project holds great promise not only to improve the transit travel experience of residents of the Central Puget Sound region but also to serve as a template for the implementation and operation of a large, complex fare card system for transit agencies across the nation. The evaluation seeks to convey a clear understanding of the range of institutional, organizational and governance issues addressed throughout the development of the project and how they were resolved. The report offers an objective outside perspective on those institutional and process elements, including a set of "lessons learned," that will be of most value to a general audience, including in particular other transit agencies that are considering developing or participating in similar regional fare card initiatives. Building on the experience of the Central Puget Sound RFC Project, and the lessons of this and other fare card systems around the country, offers transit agencies perhaps the best opportunity to identify a path to successful project implementation. Working with these examples, the challenge will be to adapt them to successfully fit the unique needs and conditions in other locations.

17. Key Words	18. Distribution Statement		
Fare card; fare coordination project; public transportation; transit; evaluation; institutional assessment; lessons learned; Washington State	No restrictions. This document is available to the public through the National Technical Information Service, Springfield, VA 22161.		
19. Security Classif. (of this report) None	20. Security Classif. (of this page) None	21. No. of Pages 111	22. Price

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

TABLE OF CONTENTS

List of Figures

List of Tables

EXECUTIVE SUMMARY

Background. Seven public transportation agencies operate bus, rail, and ferry services in four counties in the central basin surrounding Puget Sound in western Washington State. Using public and private funding, these agencies are partnering to offer their public transportation customers a single electronic fare medium – a *fare card* – that will enable seamless travel across the region using multiple transportation service providers. This is a large region, covering over six thousand square miles and a population of 3.5 million persons residing in both rural areas and densely populated urban areas centered on Seattle. The Central Puget Sound Regional Fare Coordination (RFC) Project partners currently include: King County Metro Transit (the largest agency), Community Transit, Everett Transit, Kitsap Transit, Pierce Transit, Sound Transit and the Washington State Ferries.

Travel by highway and rail is substantially constrained by the geography of Central Puget Sound to take place in a north-south direction. One consequence of this geography and the large population residing and commuting in the Central Puget Sound region is a high level of traffic congestion. Early in the decade of the 1990s the Washington State Legislature, recognizing the worsening transportation problems in the region, encouraged the formation of the Regional Transit Authority and focused attention on the need for greater coordination among transportation agencies throughout the region. Several limited fare integration projects were implemented that have laid a strong foundation for the current RFC Project. These include the U-PASS and Puget Pass projects. The RFC Project seeks to replace over 200 separate fare media with a single fare card and cash payment options for travelers.

Evaluation Objectives. The Intelligent Transportation System (ITS) Joint Program Office (JPO) of the U.S. Department of Transportation (USDOT) contracted with Battelle to evaluate the RFC Project. The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) see great value for other locations and agencies in documenting the processes that have been followed by the partners and the strategies that they have applied to address institutional, technical, organizational, governance, financial, contractual, and other challenges. Battelle has teamed with CRA International (CRA) to carry out the evaluation, and the findings and lessons learned, based on the early organizational and project design elements of the project are documented in this report. Specific objectives of this evaluation have evolved based on project schedule changes and discussions with the ITS JPO and the local partners. They now include the following:

- Document the RFC Project's institutional and organizational history, and a timeline of the important milestones.
- Analyze the processes by which the project partners identify, address and resolve issues associated with planning and implementing the RFC Project.
- Identify the ways in which the RFC Project integrates the partner agencies.
- Identify findings that are applicable to other agencies and settings.

- Assemble historical and projected cost data, and coordinate with the JPO cost database to contribute to a current understanding of the cost implications of the RFC Project.
- Prepare a set of Lessons Learned for on-line posting based on the findings from the evaluation.

In order to meet these objectives, the evaluation team reviewed a comprehensive set of project documentation and prior relevant research studies. The team interviewed numerous staff and management in each of the seven partner agencies, the vendor representative, regional FHWA staff, and members of the Regional Team who are responsible for the administration of the project and the contract with the vendor. In addition, the team has reviewed reports and evaluations of several other national fare card projects, such as TransLink® in the San Francisco Bay Area and the ORANGES Field Operational Test (FOT) program in Orlando, Florida.

RFC Project Timeline. Transit agencies and elected officials in the Seattle area began planning for the RFC Project over a decade ago, and the project is currently (early 2006) testing and installing a subset of the equipment prior to a limited "beta" test of revenue service operations. The milestone events that launched the development phase of this project were the official signing on April 29, 2003 of the agreement among these partners (the Interlocal Agreement) and a contract with the vendor selected to provide the hardware and software for the electronic fare card systems (ERG Corp.) The revenue service operational test of the system is anticipated to occur in the third quarter of 2006, with full installation taking place in the first, second and third quarters of 2007, and commencement of regular system operations in the fourth quarter of 2007. The RFC partners are faced with implementing a fundamentally new way of doing business among agencies that have their own long-established systems and procedures, as well as a desire and willingness to arrive at a common, operable regional fare card system.

The Battelle team began working on a "lessons learned" evaluation of the project in February 2003. Since then, the Battelle team has conducted interviews with many representatives of each partner agency, as well as with the staff of the Regional Team that is responsible for administering the vendor contract and overseeing the complex day-to-day system development process. This report provides a timeline that outlines the history of this project and the events that have shaped it into its current form. This history is still being created, and the project continues to evolve as it is developed and tested.

Evaluation Findings: Lessons Learned. The RFC system is one of the few current national examples of large-scale regional fare card implementation projects. It holds great promise not only to improve the transit travel experience of residents of the Central Puget Sound region but also to serve as a template for the implementation and operation of a large, complex fare card system for transit agencies across the nation. The evaluation seeks to convey a clear understanding of the range of institutional, organizational and governance issues addressed throughout the development of the project and how they were resolved. The report offers an objective outside perspective on those institutional and process elements, including a set of "lessons learned," that will be of most value to a general audience, including in particular other transit agencies that are considering developing or participating in similar regional fare card initiatives. Building on the experience of the Central Puget Sound RFC Project, and the lessons of this and other fare card systems around the country, this evaluation offers transit agencies in

other regions perhaps the best opportunity to identify a path to successful project implementation.

This evaluation has captured its main findings in a series of lessons learned. There are of course many lessons that could be derived from the partners' experiences to date, and many more will undoubtedly emerge in the future. The lessons highlighted here seek to address the broad areas of project governance, the importance of understanding the context in which the project is being implemented, the factors that appear to motivate participation in a regional project like this one, and a number of key issues associated with project management, technology risk, project finance, and legal issues. These are the issues that can be expected to be faced in a regional fare card project anywhere in the country. The important point is to view these lessons as a form of awareness-building or sensitizing to institutional aspects of these programs that require careful consideration from the early stages of such a project. None of these lessons should be accepted uncritically; rather, their potential relevance to an evolving program should be carefully assessed in the course of program design and decision-making. With this approach in mind, it is hoped that the findings and lessons derived to date from the Central Puget Sound RFC Project will prove useful and suggestive to others who seek to implement a regional fare card project of their own. Principal lessons include:

- *Consider a "consensus" organizational model to help assure support and participation of partners in a regional fare card project.*
  Allowing each partner an equal say in decision making in the regional partnership helps build trust, understanding and buy-in by ensuring that no one agency will dominate the process. The consensus approach emphasizes the values associated with a philosophy of regionalism over individual agency self-interest. A likely consequence of the consensus approach, however, is that it will require more staff time and cost than a structure with one lead agency. Either approach should be guided by a formal agreement, endorsed by the highest levels of management in each participating agency, which specifies roles, responsibilities and organizational structure. The Interlocal Agreement served that purpose for the Central Puget Sound RFC Project.

- *Examine the contextual factors that characterize the region and the participating agencies, and carefully manage the associated issues that will determine the success or failure of a regional fare card project.*
  Contextual factors include each agency's customer base, regional geography, agency size and services, agency governance structure, technology applications and needs, and existing fare structure. Each agency will experience a unique mix of these factors, and they need to be carefully understood with regard to their implications for regional decision making and devising good solutions in support of approaches that meet the needs of the entire region.

- *Understand the issues, strategies and trade-offs that motivate agencies to join in a regional partnership and provide appropriate support.*
  The state legislature is in a good position to recognize the region-wide value of a fare card program and can encourage broad participation. The larger partner agencies can assume more of the risks and can set a good example as early adopters of the new

technologies. Central Puget Sound has benefited by having Sound Transit help underwrite some of the costs and liabilities for the smaller agencies to join the partnership, even though the project may not have appeared to "pencil out" for some of these agencies.

- *Consider the value of implementing a limited fare pass program initially to serve as an interim experience base for a comprehensive region-wide electronic fare card system*
  The Puget Sound region benefited from several precursor fare programs that helped "break the ice" by giving travelers and agencies some experience with smaller scale implementations that demonstrated the value and viability of such fare systems. At this point in the evolution of regional fare card programs across the country, the lessons from Puget Sound and elsewhere may be just as useful as, and likely more cost-effective than, implementing limited deployments in a step-wise fashion. Nevertheless, partial implementations may still be of great value, and the individuals who gain first-hand experience with such initial fare pass programs can be of assistance in guiding the development of a full region-wide system.

- *Provide for appropriate legal support services to address the many significant legal issues faced in implementing a regional fare card project.*
  Regional fare card projects will likely face a variety of legal challenges, from the initial preparation of the RFP and negotiations with the candidate vendors to aspects of contract language, change amendments, specification of terms and conditions, intellectual property issues, warranty and maintenance, indemnification against lost revenue and claims, and contractor performance security[1]. It may be helpful to consult with partnerships that have already undertaken a regional program to better understand the likely legal issues and ways to address them. The Central Puget Sound RFC Project established a legal advisory team to deal with these issues, and this has proven to be a very useful structure for them.

- *The technical, procedural and organizational complexity of a regional fare card program implementation suggests the need to plan for greater time, cost and management challenges than might be expected.*
  Assigning a full time site manager with the needed skills and experience in each partner agency seems to be a prerequisite for success. The consensus model of governance is particularly time consuming, as discussed above. It is critical to allow adequate time in the project schedule for document reviews, legal review, meeting attendance, technical integration, working with the vendor, and management oversight and coordination. Also, more time and cost will be associated with a need to modify or customize hardware and software systems than with adopting an off-the-shelf solution. Flexibility and willingness to change as the project evolves are critical organizational success factors.

- *Provide for a regional team, sufficiently staffed, to support and lead the project.*
  The Regional Team on the RFC Project includes a Contract Administrator and a Technical Manager. The Interlocal Agreement did not provide for a traditional project

[1] A deposit of funds to guarantee performance.

manager position. The Regional Team plays a crucial role in supporting the extensive regional coordination and leadership workload of a project of this magnitude, but experience to date has shown that the Regional Team has been understaffed and lacked adequate focus on standard project management activities involving project planning, scope, schedule, direction, and guidance of key elements of the project. In recognition of this need, additional resources have been provided, and a new position of Regional Implementation Manager has been created to help meet these pressing needs.

- *Anticipate, understand, address and manage the risks associated with fare card technologies and the vendor relationship.*
  The risks of modifying an off-the-shelf system or selecting a customized fare card technology (hardware and software) are potentially much greater than the risks associated with accepting an off-the-shelf technology that is already proven. One way to manage the risks is to establish a large performance security requirement at the outset of the vendor selection process to help assure that only financially secure firms are likely to respond. It is preferable to select a vendor with established electronic fare card systems deployed elsewhere that also meet most of the requirements of the project. This helps avoid the risks of adopting unproven technologies. Customized software may need to be developed in order to accommodate the partners' existing legacy systems with which a new fare card system must be integrated. These risks usually cannot be avoided, though in the case of Puget Sound not all the partner agencies had legacy integration issues. Other ways to control risk include (1) establishing an escrow account to protect source code and documentation against the risk of vendor default, and contractually require the vendor to deposit its proprietary source code, build documentation, and periodically update them, (2) requiring a conservative payment schedule that allows for major milestone payments at limited points in the contract, each associated with a significant and satisfactory completion of work, and (3) requiring extensive and comprehensive insurance coverage from the vendor.

- *Understand the fare policy objectives and fare structure of each partner agency and establish a regional framework that can accommodate these different structures and is viable for all the partners.*
  The Central Puget Sound partner agencies selected a coordinated fare arrangement that enables passengers to use a single fare medium but allows partner agencies to retain autonomy in setting their fare policies. The main alternative is an integrated fare structure that operates on a single standard when calculating fares. The coordinated regional framework is likely to be perceived by the customer as more complicated and to entail greater programming costs for the agencies.

- *Complex regional fare card projects likely will involve finance plans that include a diverse array of funding sources and demand significant flexibility and creativity on the part of the partner agencies.*
  The Central Puget Sound RFC Project finance plan includes federal, local and private funding sources. A unique aspect of this project is the provision of funding to selected partner agencies by Sound Transit to subsidize the first few years of capital and operating

costs. This early financial support has been a critical factor in encouraging several of the partner agencies to participate in the regional program.

Conclusion. While these lessons address many of the larger issues associated with the implementation of a regional fare card program, they by no means cover them all. Recognizing the nature of these issues and seeking to address them early in program development will, however, help agencies anticipate many of the governance and policy challenges inherent in such programs and avoid many of the major pitfalls. The challenge will be to adapt these examples to successfully fit the needs and conditions of each region and their participant agencies.

1. INTRODUCTION

1.1 Background

The Intelligent Transportation System (ITS) Joint Program Office (JPO) of the U.S. Department of Transportation (USDOT) contracted with Battelle to evaluate the Central Puget Sound Regional Fare Coordination (RFC) project in Washington State. Battelle teamed with CRA International to carry out the evaluation.

The goal of the RFC Project is to offer public transportation customers in the Central Puget Sound region a single electronic fare medium – a *fare card* – that will enable them to travel seamlessly across the region using multiple transportation service providers. The RFC Project currently includes seven partner agencies operating in four counties in the Central Puget Sound region. These agencies are: King County Metro Transit (the largest agency), Community Transit, Everett Transit, Kitsap Transit, Pierce Transit, Sound Transit and the Washington State Ferries.[2] Backing up the fare card itself is an extensive set of agreements between the partner agencies regarding revenue sharing, fare policies, business processes and other issues; as well as hardware and software that process fare transactions, communicate transaction data, reconcile revenues, and others.

Transit agencies and elected officials in the Seattle area began planning for the RFC over a decade ago, and the project is currently (early 2006) testing and installing a subset of the equipment prior to a limited "beta" test in revenue service operations. The milestone events that launched the development phase of this project were the official signing on April 29, 2003 of the agreement among these partners (the Interlocal Agreement) and a contract with the vendor selected to provide the hardware and software for the electronic fare card systems (ERG Corp.) The beta test of the system is anticipated to occur in the third quarter of 2006, with full installation taking place in the first and second quarters of 2007, and commencement of regular system operations in the third quarter of 2007. The RFC partners are faced with implementing a fundamentally new way of doing business among agencies that have their own long-established systems and procedures, as well as a desire and willingness to arrive at a common, operable regional fare card system.

The Federal Highway Administration (FHWA) and the Federal Transit Administration see great value for other locations and agencies in documenting the processes that have been followed by the partners and the strategies that they have applied to address institutional, technical, organizational, governance, financial, contractual, and other challenges. To this end, the Battelle Team began working on a "lessons

An Interlocal Agreement officially launched the development and testing of the Regional Fare Coordination project on April 29, 2003.

[2] There are provisions for other agencies to join in the future, but the current partnership configuration represents the great majority of regional travelers who stand to benefit from a coordinated fare card system.

learned" evaluation of the project in February 2003. Since then, the Battelle Team has conducted interviews with many representatives of each partner agency, as well as with the staff of the Regional Team that is responsible for administering the vendor contract and overseeing the complex day-to-day system development process.

This report provides a timeline that outlines the history of this project and the events that have shaped it into its current form (Table 2). This history is still being created, and the project continues to evolve as it is developed and tested.

The RFC system is one of the few current national examples of large-scale regional fare card implementation projects. It holds great promise not only to improve the transit travel experience of residents of the Central Puget Sound region but also to serve as a template for the implementation and operation of a large, complex fare card system for transit agencies across the nation.

1.2 The Central Puget Sound Region

Figure 1 presents a map of the Central Puget Sound region served by the seven RFC partner agencies. The map shows the major urban centers in the counties that comprise the jurisdiction of the Central Puget Sound Regional Council of Governments, which is the Metropolitan Planning Organization for the region.[3] Figure 1 shows the major rail and freeway links connecting Everett in the north, Tacoma in the south, and Seattle and Bellevue in the middle. It also includes the Washington State Ferries terminals that link cities in Kitsap and Island Counties with the west side of Central Puget Sound.

[3] The PSRC membership includes King, Kitsap, Pierce and Snohomish counties, 70 cities, three ports, two Indian tribes, Washington State DOT, and the Transportation Commission. The region's transit agencies and six associate members also participate in the Regional Council. See www.psrc.org for details.

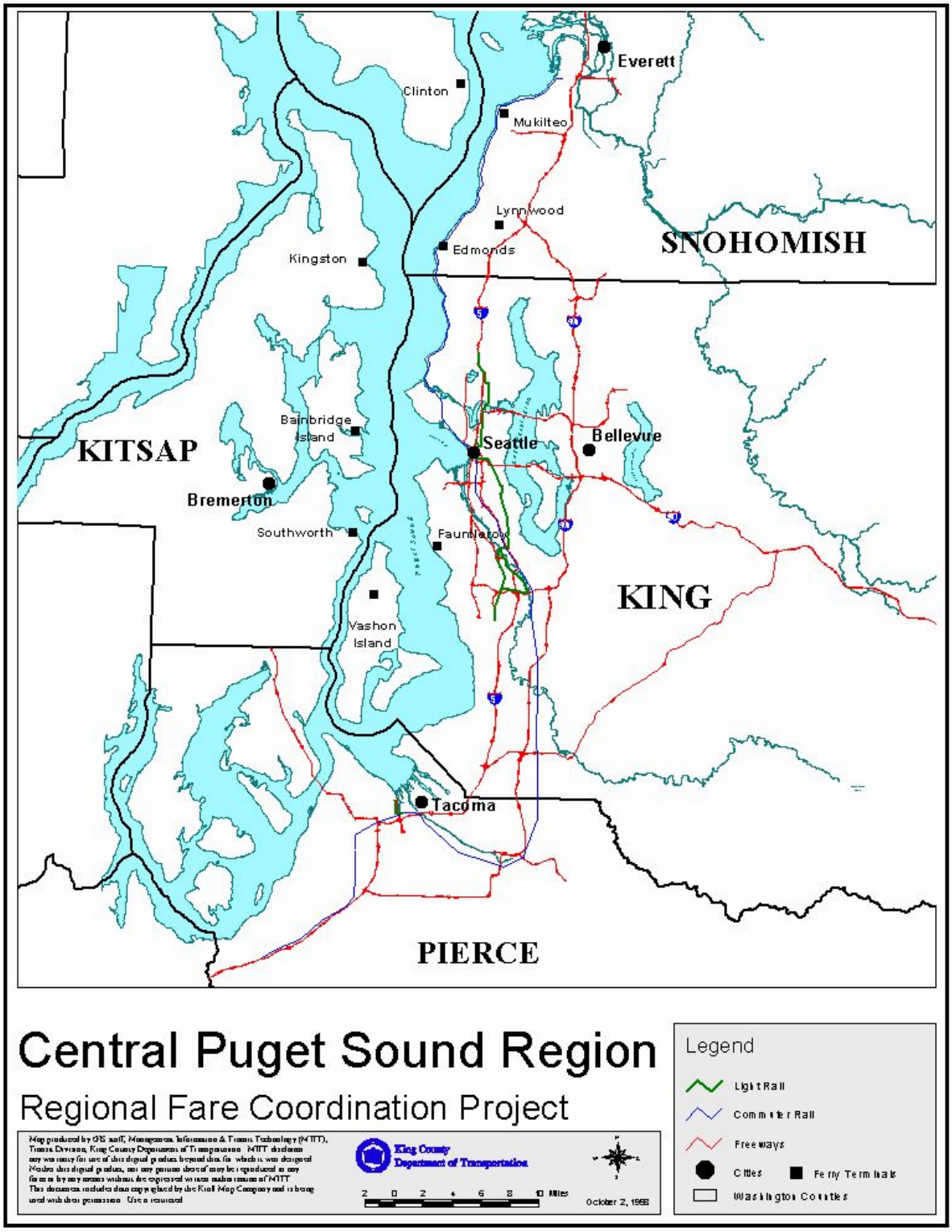

Figure 1. Map of Central Puget Sound.

Table 1 indicates the size of the region covered by the RFC Project in terms of population and land area.

Table 1. Population and land area for the Central Puget Sound region.

County	Population (2005)*	Land Area (Sq. Mi.)**
King	1,808,300	2,131 sq. mi.
Kitsap	240,400	393 sq. mi.
Pierce	755,900	1,676 sq. mi.
Snohomish	655,800	2,098 sq. mi.
Region Total:	3,460,4600	6,298 sq. mi.

**2005 Population Trends for Washington State,* OFM Forecasting Division, State of Washington, September 2005, T3.

***Quick Facts about the Central Puget Sound Region, Puget Sound Regional Council, 2000.

As shown in Figure 1, travel by highway and rail is substantially constrained by the geography of Central Puget Sound to take place in a north-south direction. One consequence of this geography and the large population residing and commuting in the Central Puget Sound region is a high level of traffic congestion. The Texas Transportation Institute (TTI) annual assessment of congestion in U.S. urban areas has consistently placed the Seattle area among the more congested areas in the country.[4]

In the TTI's 2005 report, Seattle ranks as the 12th most congested out of 85 urban areas, with a Travel Time Index for 2003 (the most current data) of 1.38, indicating that travel in the area takes 38% longer during peak periods compared with free flow conditions. In just over 20 years, the index has risen to its current level from 1.07 in 1982 when Seattle ranked as the 27th most congested city. The region's public transportation system serves a significant ridership and substantially mitigates this mobility problem. One long-term objective of the RFC Project is to enhance further the ease and attractiveness of the region's public transportation system.

Data on travel flows between home and work are compiled under the year 2000 Census Transportation Planning Package (CTPP), the product of a cooperative program between the US Census Bureau, the American Association of State Highway and Transportation Officials (AASHTO) and individual state Departments of Transportation. CTPP data can be used to examine current patterns of public transportation use for the journey to work, as well as cross-jurisdictional flows and changing socio-economic and travel patterns over time. Figure 2 shows the number and percent of workers in 2000 who worked outside their home within the four counties (King, Kitsap, Snohomish, and Pierce) that comprise the region covered by the RFC Project. In 2000, roughly 10 percent of all King County residents who worked outside of their home used public transportation to travel to work, up from 9 percent in 1990. The important role that King County Metro Transit plays in the regional transportation system is apparent from this chart.

[4] Schrank, D. and T. Lomax. 2005. *The 2005 Urban Mobility Report.* Texas Transportation Institute. (May).

The Puget Sound Regional Council has published results of a recent study on the work trips in the region.[5] Trips to the region's five major downtown business districts represent about 17% of all trips to work. About one-third of all the daily work trips from Pierce County (6,019 work trips) and Snohomish County (15,769 work trips) to the Seattle Central Business District (CBD) are by bus.

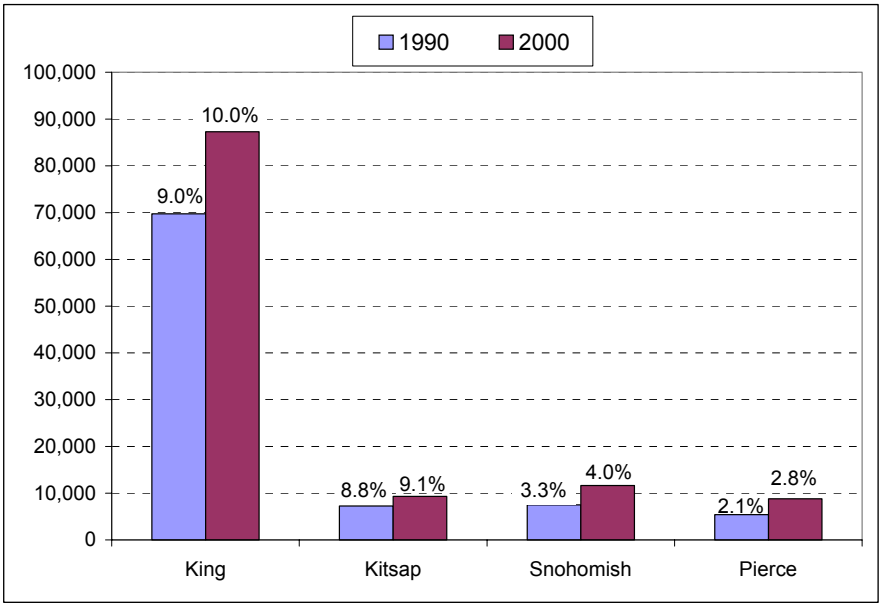

Figure 2. Average daily number and percent of persons 16 years and older who work outside of their home and use public transportation to travel to work, by county and year (1990 and 2000).

1.3 Organization and Objectives of Report

This report focuses on the process of developing a regional fare card system in Central Puget Sound, and the experiences and lessons learned by each of the partner agencies as they sought to address their needs, to meet the travel needs of their customers, and to achieve a workable regional consensus. It is not intended to be a comprehensive evaluation of all aspects of this complex project; rather, it seeks to convey a clear understanding of the range of institutional and organizational issues addressed throughout the development of the project and how they were resolved. The report seeks to offer an objective outside perspective on those institutional and process elements that will be of most value to a general audience, including in particular other transit agencies that are considering developing or participating in similar regional fare card initiatives.

This report focuses on identifying practical "lessons learned" from an evaluation of the experiences of the Puget Sound area RFC partners.

[5] Puget Sound Regional Council. 2004. *Origin of Work Trips to the Region's CBDs.* Puget Sound Trends. No. T24. (August).

The evaluation addresses the evolution of regional and agency-specific policies, the motivations for and against participation, the issues and challenges faced by each agency, and the decisions and compromises that were made. It seeks to tell the story of how this particular project was developed, in a way that will be useful and informative to others who may be considering implementing a similar fare card system. The report describes the context in which the RFC Project is being implemented, the historical timeline and key events, and the characteristics and experiences of the partner agencies as they sought to work through a host of organizational, institutional, contractual and technical challenges. It seeks to extract from this evaluation lessons that will be useful to others across the nation. The report contains the following chapters:

Chapter 2. Evaluation Approach and Objectives
Chapter 3. Partner Agency Characteristics and Relationships
Chapter 4. Motivations for Partnership
Chapter 5. RFC Project Timeline
Chapter 6. Governance, Communications and Decision-Making
Chapter 7. Project Management
Chapter 8. Issues and Challenges
Chapter 9. Conclusions and Lessons Learned

1.4 Lessons Learned

There are many lessons that have been learned and are yet to be learned in the course of planning, developing, implementing, testing, and eventually operating the RFC Project in Central Puget Sound. In addition to its broader analysis and discussion, this report attempts to distill its investigation of the particular issues, challenges and successes of the RFC Project that are most likely to be of value to others into succinct statements of specific "lessons learned."

> This evaluation provides valuable "lessons learned" for agencies that are considering implementing a regional fare card system. Lessons learned are presented in shaded text boxes throughout this report.

Each lesson is a synopsis of a set of related issues. They reflect the thoughts and perspectives of the partners and other participants from the early conceptualization of the regional fare card system through the final design review, but short of actual system testing and implementation. They have been drawn from the Battelle Team's observations and interactions with the participants over the course of this evaluation. Given the complex institutional and political environment in which the RFC Project has been developed, opinions on many of the issues covered in this set of lessons learned will inevitably vary.

The evaluation team has tried to present each lesson as objectively as possible, but caution is in order when considering the applicability of a lesson to different external situations and conditions. The reader is encouraged to seek additional background and evidence both from this evaluation report and from related documentation produced by the RFC Project Regional Team staff. Users of these lessons will want to adapt them to their particular circumstances based on their knowledge of the situation to which they are being applied.

The ITS JPO has established an on-line database system to make the lessons learned from a variety of evaluations readily accessible to anyone who may be interested.[6] The lessons presented here have been reformatted for posting on the ITS Lessons Learned web site in a way that is consistent with the standard template developed for this on-line database. Lessons learned are grounded in the experiences of the participants in this project and reflect what worked well, what didn't work as well, an understanding of why, and how improvements could be made. They reflect practical, useful guidance for anyone interested in implementing a similar project elsewhere.

The lessons are summarized in separate text boxes that are imbedded in the report chapters to which they are most closely associated. Each text box covers a set of findings and insights organized around a general lessons-learned topic.

[6] http://www.itslessons.its.dot.gov/

2. EVALUATION APPROACH AND OBJECTIVES

2.1 Introduction

The evaluation of the Central Puget Sound Regional Fare Coordination project responds to the objectives of the ITS JPO as well as the partners of the RFC Project. When reviewing earmarked projects to select candidates for evaluation, the USDOT seeks to identify those projects that meet a minimum set of criteria that include:

- Potential to fill selected data gaps;
- Likelihood that the project will be completed in a reasonable timeframe, thereby yielding timely evaluation results;
- Clearly defined integration of project components;
- Adequacy of funding to achieve project objectives; and
- Relevance of the project to other specific FHWA ITS program needs.

The USDOT selected this particular RFC Project for evaluation because it represents one of the nation's most visible and leading efforts to establish a multi-agency electronic fare card system, and because of the high level of national interest in establishing other programs of this type.

A case study evaluation was considered the most useful approach to apply in this instance. *Case study* evaluation design involves documentation of the institutional processes established and followed by the project participants, as opposed to a more traditional *before-after* evaluation design that compares data collected prior to and following the implementation of a project in order to assess its impacts. Because the time horizon for full implementation of the Central Puget Sound RFC Project is long, and evaluation results useful to others are needed as soon as possible, a case study approach was felt to be most appropriate and beneficial.[7]

The evaluation examines the regional governance issues associated with the development of the project. It also seeks to document institutional processes that extend beyond governance issues to include a more complete set of issues faced in such areas as finance, contracts, fare card technology integration, and relationships among the agency partners and with their customers and the vendor. This approach seeks to provide a detailed assessment of the key issues faced across many aspects of the RFC Project and a discussion of how they were addressed and resolved. Overall, the evaluation seeks a balance between analysis breadth and depth by keeping the focus on key issues, partner motivations and perspectives on these issues, decision processes used in addressing the issues, and outcomes and

> The evaluation seeks to understand institutional, governance, financial, inter-agency, contractual, policy and technical issues: How were they addressed and resolved?

[7] An Evaluation Strategy report was submitted to FHWA by the evaluation team on May 9, 2003. This report presents in detail the evaluation objectives, approach and data collection methods.

benefits derived from these processes. In this way, the evaluation intends to highlight those aspects of the RFC Project planning and implementation processes that will be of most value to others. More detailed descriptive and technical data on specific aspects of the RFC Project are available through the project partners but will only be covered here to the extent necessary to set the context for an evaluation of the issues.

2.2 Objectives of the RFC Evaluation

The scope of this evaluation has evolved since the development of the initial Scope of Work (SOW) in May 2002. The original SOW included two evaluation components, as follows:

- An assessment of the processes by which the Project Partners identify, address and resolve a variety of institutional and policy issues that are expected to be confronted when seeking to implement a complex new regional fare card program among seven transportation agencies, each with a history of different management and operating systems, needs, interests, and constituencies.
- An evaluation of selected other data that are already being collected by the partner agencies or data that otherwise are readily available and relevant to the goals of the IPAS program. In this sense the case study format will be expanded to include an examination of these additional data, as long as it doesn't involve additional original (primary) data collection requirements by the contractor. Examples might include available cost and revenue data, driver performance logs, bus boarding statistics, or data on the diffusion of the new fare media. The specifics will depend on learning more about what data will be readily available that are directly relevant to the evaluation objectives.

As assumption underlying the initial SOW was that the evaluation period would extend through the beta test and initial deployment of the RFC Project components. An evaluation strategy document was issued in June 2003 that discussed needed changes in the original evaluation objectives noted above, based on discussions with the Project Partners. It became clear that the full implementation of the RFC Project was going to be extended beyond the original projected timeframe and that it would not be feasible or useful to extend the evaluation period to coincide with the beta testing. Therefore, the kinds of data outlined in the second bullet objective above would not be available to the evaluation.

The ITS JPO directed the project evaluation team in November 2004 to include in the work scope a new focus on preparing a set of lessons learned reports for posting on the USDOT web site. Thus, the objectives of this evaluation have evolved over time, consistent with the realities of the RFC Project implementation schedule and the needs of the ITS JPO. The current objectives, as agreed upon in discussions between the ITS JPO, the RFC administrator and the evaluation team, include:

1. Document the institutional and organizational history, and a timeline of the important milestones of the RFC Project.
2. Analyze the processes by which the project partners identify, address and resolve issues associated with planning for and implementing the RFC Project.

3. Identify the ways in which the RFC Project integrates the partner agencies.
4. Seek to distinguish findings that are applicable to other agencies and settings, and those that are unique to the Central Puget Sound regional context.
5. Assemble historical and projected cost data and coordinate with the JPO cost database to contribute to a current understanding of the cost implications of the RFC Project.
6. Prepare a set of Lessons Learned for on-line posting based on the findings from the evaluation.

In order to meet these objectives, the evaluation team has reviewed a comprehensive set of project documentation and prior relevant research studies. The team has interviewed numerous staff and management in each of the seven partner agencies, the vendor representative, regional FHWA and FTA staff, and members of the Regional Team that is responsible for the administration of the project and the contract with the vendor. In addition, the team has reviewed reports and evaluations of several other national fare card projects, such as TransLink® in the San Francisco Bay Area[8] and the ORANGES Field Operational Test (FOT) program in Orlando, Florida.[9]

As of this writing, project development is still underway. It is expected that a "beta" test of the system, involving all back office operations and equipping a subset of the partner agencies' fleets, will take place in the third quarter of 2006, followed by full system installation in the first three quarters of 2007, and full revenue service operations in the fourth quarter of 2007.

2.3 Prior Research

The research team reviewed literature documenting the history and evolution of automated fare and smart card technology in the U.S. and around the world. The literature is focused on transit applications of automated fare payment systems and smart card evaluations and deployments.

Smart card technology has been evaluated and deployed in several locations across the U.S. and around the world during the past 10-15 years. In recent years, smart card evaluations have generally taken place as part of a beta test or demonstration phase of a comprehensive regional fare card system. In the U.S., examples of these systems can be found in Chicago, Orlando, the San Francisco Bay Area, Washington, D.C., Phoenix, Los Angeles, Ventura County in Southern California, and Seattle. International examples include applications in London, Paris, and Hong Kong.

Prior to deployment of smart card technologies, the literature focused on "proof of concept" evaluations and limited deployment demonstrations. In 1994, the Partnership for Advanced Transit and Highway (PATH) conducted an evaluation of a Los Angles smart card Field Operational Test (FOT) for the California Department of Transportation (Caltrans) and the

[8] http://www.translink.org/jsp/index.jsp
[9] The Orlando Regional Alliance for Next Generation Electronic Payment Systems is a smart card payment system sponsored by the FTA and undergoing tests on a toll road, the LYNX bus system, and in city parking garages. See http://www.golynx.com

Federal Transit Administration (FTA).[10] The FOT deployed automated fare collection (AFC) technologies on three transit properties. The FOT deployed two smart card technologies with different capabilities. The first was a contactless radio frequency (RF) smart card that only needed to pass within a few inches of a passenger interface unit (PIU) in order to complete the transaction. The second technology involved a smart card requiring insertion in a PIU to complete the transaction.

The results of the FOT indicated that the technology worked well in Los Angeles. Contactless RF smart cards proved to be extremely reliable and convenient. However, the research team recommended that a lockout period[11] be imposed on the use of the RF cards in order to prevent unintentional multiple transactions. The smart cards requiring contact demonstrated a higher degree of reliability relative to magnetic stripe cards but did not perform well compared to the RF cards. The smart cards requiring insertion into PIUs were inconvenient and exhibited a technology failure rate above levels deemed appropriate for transit applications.

The Los Angeles FOT also demonstrated that system performance improved significantly over time. The lockout period requirement was an example of a system enhancement recognized and addressed during the FOT.

In another early test of the smart card technology, the Régie Autonome des Transports Parisiens (RATP) network in Paris, considered among the most innovative in the world and one of the first transit operators to adopt an AFC system in 1973, examined two technologies designed to replace its out-of-date system of magnetic stripe cards. The RATP conducted its own evaluation in 1996.[12] The smart card system was necessary because the magnetic stripe cards were unreliable, with up to 10 percent of all users experiencing card demagnetization. The smart card system allowed RATP to offer a range of products and created marketing and customer service opportunities through its electronic purse (multiple accounts on the same card) function. RATP concluded that contactless smart cards were the most effective fare medium, representing the next generation of fare card technology.

The UK conducted its own evaluation of the contactless smart card in the 1990s, with pilot tests conducted on mass transit systems across the country.[13] In one test, more than 180 buses were equipped with on-board fare transaction processors, and approximately 20,000 smart cards were issued to customers. On average, nearly 8,000 daily transactions were recorded during the demonstration.

The results of a pilot test conducted in the Harrow area, located northwest of London demonstrated that:

---

[10] Moore, James II and Giuliano, Genevieve. Functional Evaluation of the Los Angeles Smart Card Field Operational Test. Washington D.C.; 1998; Transportation Research Part C 6.

[11] If a transit passenger unintentionally passes their fare card across the card reader more than once in quick succession, an additional fare charge could be recorded to their account. A brief lockout period of up to 7 seconds after the initial swipe can prevent unintended multiple fare card charges.

[12] Ampelas, Andre and Vappereau, Phillippe. Paris' Contactless Smart-Card for Ticketing a Telepayment System for Pedestrian. Public Transport Electronic Systems, Conference Publication No. 425. May 1996.

[13] Higgs, M. J. Smartcards – The Key to Unlocking Revenue Growth. Public Transport Electronic Systems, Conference Publication No. 425. May 1996.

- customer satisfaction associated with the smart card was very high,
- the technology proved to be extremely reliable,
- operators found the technology easy to operate, and
- the amount of management information generated by the new system far exceeded that historically acquired through traditional surveys.

Based on the outcome of the pilot test, the technology evaluators found that most of the key objectives of an AFC system could be obtained through deployment of a contactless smart card. The study went on to predict a future development path of the smart card technology, which included wider exploitation of the card, enhanced incentive schemes, standardization of the technology and expanded use of e-purse capabilities.

Chicago's AFC system was the focus of a 2000 study performed by Foote and Stuart.[14] This study examined the relation between the AFC system and shifts in fare media usage. The study reported that in its second year of full operation, 1.2 million passengers were using AFC on Chicago Transit Authority (CTA) bus and rail systems. Between 1996 and 1999 there was a significant shift in the use of fare media:

- token usage was phased out entirely (down from 42 percent of total revenue in 1996),
- cash payments declined from 52.1 percent to 35.1 percent of total farebox revenue,
- prepaid pass usage grew to 18.5 percent of total farebox revenue, and
- fare cards grew to 46.4 percent of total farebox revenue.

The study's findings also suggest that implementing the AFC system contributed to a larger than anticipated passenger growth rate of 4.3 percent in 1999.

Smart card technologies applied to broader transportation applications have gained favor in recent years. One such system, ORANGES, was developed in Orlando, Florida. ORANGES was deployed with multi-agency collaboration as a U.S. DOT ITS Field Operational Test (FOT). It included a central payment and clearinghouse system with smart cards used in multiple transportation settings – transit, toll and parking. The U.S. DOT published in 2004 a Phase I risk assessment report as part of a national evaluation.[15] The report documented both qualitative and quantitative goals for the ORANGES system. Quantitative goals included those targeting revenue enhancement, increased market penetration, cost savings, time savings and expanded use of prepaid cards. Qualitative goals centered on customer satisfaction, ease of use and information generated by the system. The ORANGES FOT was concluded in 2004.

The initial FOT included deployment on transit (two LYNX bus lines), toll (Holland East toll plaza) and parking (Central Boulevard, Library and Market Street garages in Orlando) systems. During the test, partner agencies planned to maintain 800-1200 cards. The FOT is ongoing;

[14] Foote, Peter and Stuart, Darwin. Impacts of Transit Fare Policy Initiatives Under an Automated Fare System. Transportation Quarterly, Vol. 54, No. 3, Summer 2000. Washington, D.C.
[15] US DOT / Volpe National Transportation Systems Center. ORANGES Evaluation Phase I Risk Assessment Report. March 11, 2004. Boston, Massachusetts.

however, there have been several lessons documented from the experience to date. The primary lesson to agencies interested in using smart card technology is that it is important not to underestimate the complex nature of interoperability and integration issues. The design phase of the ORANGES system took much longer than originally expected. Delays during the design phase were attributed to the lack of documented requirements for the system prior to the selection of the vendor. The U.S. DOT report also cited issues relating to the recruitment of passengers willing to participate in the demonstration as a complicating factor. Many of the enrolled participants used their cards on a limited basis or not at all. The research team recommended putting extra effort into the recruitment and screening of pilot test participants. More specific recommendations include: performing education/outreach with the participating customers, examining usage patterns of the recruits and conducting follow-up in order to isolate and eliminate participants who are unlikely to make use of the technology. Other lessons included the importance of being conservative when ordering smart cards (order more than enough to cover the pilot test in case existing models are discontinued) and to recognize tradeoffs between low cost equipment offered by vendors interested in the high profile nature of the project and performance.

Transit operators in Ventura County, California took part in a pilot test of an AFC system between January 1996 and October 1999. The demonstration project was coordinated by the Ventura County Transportation Commission (VCTC). Following deployment, FHWA and FTA presented a case study as an examination of a project where the outcome did not meet expectations.[16] Problems that were experienced during the demonstration included numerous operational shortcomings, inconsistent data and infrequent reports. South Coast Area Transit's system never achieved full operability during the pilot test due to reliability problems. Despite these shortcomings, the pilot test was considered a step forward in terms of enhanced multi-agency coordination.

The Smart Passport case study concluded that a successful multi-agency fare collection system required the following elements:

- A regional champion,
- Adequate staff resources,
- Regular and open communication,
- Vendor with a local presence,
- Pricing structure that compares favorably with the existing fare structure,
- Extensive staff training,
- System requirements established prior to selection of vendor,
- Data requirements established during planning phase,
- Defined report formats,
- Clearly defined clearinghouse and settlement responsibilities designated during the planning phase,

[16] FHWA and FTA. Promoting Seamless Regional Fare Coordination. September 2001. Washington, D.C.

- Effective and comprehensive marketing strategy,
- Programs that offer users incentives, and
- Surveys that are conducted in order to determine customer satisfaction levels and to define strategies for enhancing customer satisfaction.

The research team also noted that, provided that the key elements listed above are achieved, agencies would do well to consider alternative business models and implementation strategies. No single strategy will fit all cases.

A Charles River Associates (CRA) study published in 2002 evaluated the demonstration phase of the TransLink® system.[17] TransLink® is a smart card transit fare collection system currently under development in the San Francisco Bay Area. The CRA study examined the stated goals of the TransLink® system and evaluated data collected during the system's demonstration phase in order to draw conclusions regarding the early system performance.

TransLink® was installed in elements of systems operated by the six largest transit agencies located in the San Francisco Bay Area: AC Transit, BART, Caltrain, Golden Gate Transit, San Francisco Muni, and Valley Transportation Authority (VTA). In the demonstration phase, TransLink® was tested on every major transit mode in the Bay Area.

The regional transit coordinating council for the San Francisco Bay Area, known as the Partnership Transit Coordination Committee (PTCC), established key goals for the TransLink® system. These were focused on enhancements to passenger convenience, efficiency and security of the fare collection system, business opportunities that enhance revenues or reduce costs and the consolidation and coordination of transit services in the San Francisco Bay Area.

During the demonstration phase, the technology performed reasonably well. In terms of technological issues, no overwhelming problems were detected. Minor issues relating to poor performance among handheld card readers and some reports of out of service equipment, primarily on buses and streetcars, were noted.

In order to examine user acceptance, 4,137 passengers were initially recruited to participate in the demonstration, followed later by an additional 2,033 volunteers. Users experienced a high degree of satisfaction with TransLink® and showed interest in using the system on a permanent basis once it reaches full operability. Most customers found TransLink® easy to use and, when problems arose, their experience with the TransLink® Service Bureau's help and information line was viewed as highly positive. Customers did, however, experience problems with the add value machines and the audio components of the TransLink® system.

CRA's examination of the TransLink® demonstration phase indicated that significant additional staff training was needed. During the demonstration phase, there were issues with out-of-service equipment, which users attributed as much to poor operation as to technological malfunction.

[17] Charles River Associates and Systan, Inc. Prepared for Metropolitan Transportation Commission. Evaluation of the TransLink® Demonstration. Boston, Massachusetts. October 2002.

A recent publication sponsored by the Transit Cooperative Research Program (TCRP) signaled the future of transit fare collection through the development of recommended standards for AFC systems.[18] This study examined current multi-agency AFC systems in order to draw conclusions from what did and what did not work well during the implementation of these systems. The study did not recommend specific technologies, noting that successful regional AFC systems can be achieved through the application of a variety of technologies. Instead, the study focused on institutional, operational and financial issues.

Based on the examination of nine regional operating systems located around the world, the TCRP study proposed a multi-phased approach to the development of regional fare collection systems. The study found that multi-jurisdictional systems developed in stages were most successful. That is, most jurisdictions appeared to require initial steps towards regionalization (e.g., Puget Pass) before realizing a comprehensive regional fare card system such as this RFC Project. Recommended standards included those relating to:

- Formation of governance structures responsible for setting broad program policies for the system, managing programs, operation functions and implementing the project,
- The importance of coordination in the setting of policies related to fares, media formats, customer service activities, operating policies and cost-recovery methods,
- Design of financial standards and clearinghouse protocol, and
- Development of operating policies related to pricing, sales procedures, training and system operation and maintenance.

The literature suggests that AFC systems are following a development path with contactless smart cards as the preferred fare media. To date, this has included the development of the technology, "proof of concept" testing, deployment of contactless smart card systems in multi-jurisdictional settings, use of the card to implement complex fare policies and application of smart cards in broader transportation settings. The literature suggests that next steps along this development path could be the adoption of standards for implementing regional AFC systems and wider use of the electronic-purse capabilities of the card as a marketing tool for public transit agencies interested in forming partnerships with private partners. The evolution of electronic fare collection technologies is likely to accelerate in the near future as experience from the many deployments taking place across the U.S. generates information that will smooth the path for agencies undertaking future deployments.

[18] Lobron Consultancy, Prepared for the Transit Cooperative Research Program. TCRP Project J-6, Task 42. February 2003. Washington, D.C.

3. PARTNER AGENCY CHARACTERISTICS AND RELATIONSHIPS

3.1 Introduction

The seven agencies serving the Central Puget Sound region that joined the regional fare card partnership (Community Transit, Everett Transit, King County Metro, Kitsap Transit, Pierce Transit, Sound Transit and Washington State Ferries) are as diverse as the communities they serve. From the large-scale operations of King County Metro (KCM), the seventh largest transit agency in the US with nearly 100 million annual linked trips, to Everett Transit, a local transit agency with a 30 square mile service area, the characteristics embodied by the partner agencies drive the motivations and objectives underlying their decision to participate in the RFC Project. This section of the report examines these characteristics and sheds light on the structure, operations and communities served by these agencies. These determine the context from which each of the individual partner agencies approach a regional partnership, and contextual issues are important factors that influence the success of a regional fare card program.

3.2 Service Areas

The seven partner agencies serve the public transportation needs of the 3.5 million residents of the Central Puget Sound region of Washington State. The combined service areas of the partner agencies cover an expanse of 6,298 square miles. The size of the service areas and populations within them are highlighted in Table 2, and as the data show, they vary significantly between partners. Everett Transit serves the smallest population within the smallest service area (30 square miles), while KCM serves the largest at 2,134 square miles.

KCM is the largest provider of public transit service in the region, serving Washington State's most populous county (King) and the Seattle area that, with its 3.5 million inhabitants, has the 14th highest population among U.S metro areas.[19] The KCM service area is far larger than that of any of the other partner agencies and, within it, KCM serves a population of 1.8 million.

Sound Transit and Washington State Ferries cover the Central Puget Sound area, encompassing 954 square miles and serving a population in excess of 2.7 million. The Washington State Ferry system is the nation's largest, serving 10 routes across Puget Sound and linking major urban, suburban and rural areas in eight counties in Washington State and the Canadian Province of British Columbia.

[19] The 14th highest population when including the Seattle-Tacoma-Bremerton metro area in the 2000 U.S. Census, U.S. Census Bureau.

Table 2. Transit operations, financial and general characteristics of partner agencies.

	Community Transit	Everett Transit[2]	King County Metro	Kitsap Transit[3, 4]	Pierce Transit[5]	Sound Transit[6]	Washington State Ferries[7]
Annual Unlinked Trips[8]	8,860,946	2,005,505	98,547,887	5,049,265	14,331,875	1,017,956	24,543,754
Bus	8,266,233	1,924,034	71,009,626	4,078,056	13,265,299		
Demand Response		81,471	1,661,625	413,326	429,832		
Trolleybus			23,679,298				
Vanpool	594,713		1,793,748	219,363	636,744		
Ferryboats				338,520			24,543,754
Light Rail			403,590			266,793	
Commuter Rail						751,163	
Other							
Annual Passenger Miles[8]	124,636,958	6,938,050	532,406,507	27,494,767	122,457,811	18,972,495	193,507,330
Annual Vehicle Revenue Miles[8]	12,080,160	1,380,636	57,013,513	5,338,897	15,687,598	416,383	1,075,571
Annual Vehicle Revenue Hours[8]	552,796	116,855	3,976,491	298,238	890,156	11,597	136,159
Sources of Operating Funds Expended[8]	67,540,813	11,121,889	393,903,253	24,493,595	68,698,255	84,262,407	159,445,754
Fare Revenues	12,140,586	1,018,853	75,679,704	2,046,223	8,937,798	11,624,553	50,504,731
Local Funds	-	6,639,210	255,705,389	21,481,700	10,344	70,257,620	-
State Funds	42,023,883	74,644	851,188	-	38,157,715	-	37,286,623
Federal Assistance	7,020,865	2,085,306	22,542,434	-	6,390,393	89,080	-
Other Funds	6,355,479	1,303,876	39,124,538	965,672	15,202,005	2,291,154	71,654,400
Vehicles Operated in Maximum Service[8, 9]	473	47	2,626	242	522	28	23
Bus	237	34	1,183	85	199		
Demand Response		13	379	80	99		
Trolleybus			167				
Vanpool	236		894	75	224		
Ferryboats				2			23
Light Rail			3			2	
Commuter Rail						26	

Table 2. Transit operations, financial and general characteristics of partner agencies. (continued)

	Community Transit	Everett Transit[2]	King County Metro	Kitsap Transit[3, 4]	Pierce Transit[5]	Sound Transit[6]	Washington State Ferries[7]
Employees[8]	556	104	4,210	405	854	22	1,665
Vehicle Operations	393	89	2,999	305	634	10	1,397
Maintenance	77	4	894	56	123	6	175
General Administration	86	12	317	45	96	6	93
Year of Establishment	1976	1893	1973	1982	1979	1993	1951
Population of Service Area[8]	693,247	95,990	1,774,300	237,000	679,815	2,712,205	2,712,205
Size of Service Area (Square Miles)[8]	294	30	2,134	396	450	954	954
Governance[10]	PTBA	City	County	PTBA	PTBA	Regional Transit Authority	State
Ultimate Authority	Board of Directors	Everett City Council	Metropolitan King County Council	Board of Commissioners	Board of Commissioners	Board of Directors	Washington State Transportation Commission

[1] Community Transit data not acquired from NTD obtained from the 2004 Community Transit Budget and 2002 Comprehensive Annual Financial Report.

[2]Everett Transit data not acquired from NTD obtained from www.everettwa.org/transit/.

[3]Kitsap Transit data not acquired from NTD obtained from Kitsap Transit's Transit 101, 2004 Edition and www.kitsaptransit.org.

[4]Ferries are operated for Kitsap transit by a private operator.

[5]Pierce Transit data not acquired from NTD obtained from the 2004 Pierce Transit Budget.

[6]Data related to purchased transportation involving the operation of Sound Transit buses by other agencies included in Pierce Transit, Community Transit and King County Metro totals.

[7]Washington State Ferries data not acquired from NTD obtained from the Washington State Ferries Progress Report for the 2001-2003 biennium and www.wsdot.wa.gov/ferries.

[8]Data for these elements obtained from 2003 statistics reported in the National Transit Database (NTD).

[9]Vehicle data include both directly operated and purchased transportation.

[10]PBTA = Public Transportation Benefit Area.

Everett Transit (ET) and Community Transit (CT) both serve Snohomish County to the north of Seattle. Everett Transit's service area is 30 miles, the smallest among the partner agencies. Since 1893, it has served the public transportation needs of the roughly 100,000 citizens of the City of Everett, Washington, which is the fifth largest city in Washington State. Community Transit was voted in by the citizens of Snohomish County in 1976, thus establishing the first Public Transit Benefit Area (PTBA) in Washington State. A PTBA is a special taxing district established under Washington State law for the purpose of providing public transit services to a local community.

In the past 29 years, the CT service area has expanded as portions of unincorporated Snohomish County voted to join the CT service area. Today, the CT service area covers most of the populated portions of Snohomish County, with the exception of Everett. The CT service area comprises 294 square miles with a total population of 693,000.

Kitsap Transit serves Kitsap County and its four cities located on the Olympic peninsula on the western side of Puget Sound. Puget Sound separates Kitsap County from Seattle and the largest population and employment centers in the region. The KT service area covers the 396 square miles of Kitsap County, with a population of approximately 237,000. Kitsap Transit links the three naval bases, including the Puget Sound Naval Shipyard (PSNS), and the commuting public with the eastern side of Puget Sound through intersystem transfers with the Washington State Ferries, which operates four terminals in Kitsap County. The largest employer in Kitsap County is the U.S. Navy.

Pierce Transit (PT) serves Pierce County on the south end of the Puget Sound region. The PT service area is 450 square miles, located to the south of Seattle and including the City of Tacoma and the U.S. Army base at Ft. Lewis. The population of the PT service area is 679,815.

3.3 Trips and Passenger Miles

In 2003, the number of unlinked trips[20] on RFC partner agency systems topped 154 million, generating 1 billion passenger miles.[21]

The largest provider of transit service in the region, KCM, served the largest customer base with passengers making nearly 100 million unlinked trips on KCM in 2003 (Table 2). Annual passenger miles on KCM exceeded ½ billion, or more than 53 percent of all passenger miles on the partner agencies' transit systems in 2003. At the other end of the spectrum in terms of scale are ST and ET, which collectively served fewer than 2 percent of the passengers traveling on the

[20] The term "unlinked trip", as used in the National Transit Database (NTD), identifies the total number of passengers who board public transportation vehicles. Each time a passenger boards a public transportation vehicle, it is counted as an unlinked trip regardless of the origin and destination of the trip or the number of other vehicles boarded during the trip. The NTD definition may contrast with those applied by partner agencies, thus discrepancies could occur between NTD and agency data. This report presents published NTD data because doing so enables accurate comparisons between agencies, which are required to follow uniform procedures and guidelines when reporting to the NTD. Within this report, passengers and unlinked trips are used interchangeably.

[21] Federal Transit Administration. National Transit Database. 2003 Agency Profiles. http://www.ntdprogram.com/NTD/ntdhome.nsf/Docs/NTDPublications?OpenDocument

partner transit systems.[22] Everett Transit is a largely urban transit system with an average trip length of roughly 3 miles, the shortest trip length in the region.

In 2003, the Washington State Ferry system transported more than 24.5 million passengers and 11 million vehicles across Puget Sound. The WSF system is the second largest mass transit system in the state next to KCM and its largest tourist attraction.[23]

Pierce transit transports more passengers annually than CT or KT (14.3 million versus 8.9 million and 5.0 million, respectively); however, passenger miles on CT exceed those on PT due to the significantly longer average trip lengths on CT buses. The average trip length on CT is 14 miles, while the average trip lengths on KT and PT are five and nine miles respectively. The longer average trip lengths are due to CT's reliance on commuter traffic, which accounts for roughly 1/3 of its total riders. The KT system is designed to connect with the WSF system. Thus, average trip lengths are shorter than those on CT and PT, and total passenger miles total roughly ¼ of those on CT and PT (27.5 million versus 124.6 and 122.5 million, respectively).

3.4 Transit Operational Characteristics

The extensive regional transit system includes 1,738 buses, 1,429 vanpool vehicles, 25 ferryboats and 26 commuter rail vehicles that collectively traveled nearly 92 million miles and operated roughly 6 million hours in 2003.[24] The operation, maintenance and administration of the region's transit system are performed by the nearly 8,000 employees of the seven partner agencies. Nearly 75 percent of these employees are directly involved in operations.

Sound Transit was approved by local voters in 1996 to implement a regional transit system called Sound Move, which included three distinct elements: Sounder commuter rail, running from Everett to Tacoma; Link light rail; and a 200-bus transit system connecting Everett, Tacoma, Seattle and Bellevue. The bus system is operated for ST by CT, KCM, ET and PT. Thus, although ST directly operates only a small number of light and commuter rail vehicles, the role it plays in the development and organization of the region's transit system is much more significant.

Community Transit is primarily oriented around its large commuter passenger population, providing service between Snohomish County and major destinations in King County. In 2002, commuter lines were supported by 19 park and ride facilities connecting Snohomish County residents with the Seattle central business district, University of Washington and Washington State Ferry System. In 2003, CT operated 237 buses and 236 vans in maximum service.[25] The

[22] The ST bus fleet is operated by KCM, CT, PT and ET. Passengers riding on these buses are attributed to the agencies operating the fleet.
[23] http://transit.metrokc.gov/prog/smartcard/sc_partners.html
[24] FTA, 2003.
[25] IBID. Vehicles used in maximum operation are those required to meet maximum service requirements. This includes all vehicles in operation on the week and day when maximum service was provided to the traveling public. This measure does not include one-time extraordinary events and does not include vehicles that are not in operation when maximum service requirements are met.

vanpool service is actually more extensive with 327 passenger vans, including those in part-time operation. In 2002, CT operated the third largest public vanpool system in the U.S.[26]

Everett Transit operates 47 vehicles in maximum service. These vehicles are operated locally, though there are several transit bus stops that link the ET system to the commuter service of CT. Everett Transit also provides paratransit service to residents of Everett and nearby Mukilteo seven days a week. In 2003, ET vehicles operated nearly 117 thousand hours over nearly 1.4 million miles. Everett Transit has 104 employees.

Washington State Ferries operated 23 ferryboats full time in 2003, traveling between 20 terminals on Puget Sound. Washington State Ferries had 1,665 employees in 2003, the vast majority of whom were involved in vehicle operations (1,397). The WSF ferryboats traveled more than 1 million miles in 2003.

Kitsap Transit also operates passenger ferryboats and relies on intersystem transfers with WSF to link the citizens of Kitsap County to the employment centers in Seattle, located on the eastern shores of Puget Sound. Kitsap Transit also operates a rideshare program and a unique worker/driver program. The worker/driver program was established out of necessity during World War II as thousands of workers traveled each day to the PSNS. In an era of fuel rationing and limited resources to compensate public transit operators, employees of the shipyard were required to operate the buses. The current worker/driver program operates 21 routes to PSNS and the Naval Station in Bremerton. The drivers are full time employees of the destination military facilities and serve as part-time employees of Kitsap Transit.[27]

King County Metro operates over 2,600 vehicles in maximum service, including electric trolleys, streetcars, dual-powered buses, hybrid electric-diesel buses, standard and articulated coaches, vans and a taxi scrip program that provides discounted taxi fares to area residents who are economically disadvantaged or disabled. In 2003, KCM operated nearly 1,200 buses on 258 routes.[28] It also operates the nation's most extensive publicly owned vanpool system with 894 vans transporting more than 5,000 daily passengers. In 2003, annual vehicle revenue miles at KCM topped 57 million with vehicle revenue hours reaching nearly 4 million.

Pierce Transit operates 522 vehicles 890,000 hours annually. Pierce Transit operates both express and local bus services along 61 routes. The agency also operates a 224-van vanpool network and SHUTTLE, an on-demand service for disabled citizens. In 2003, the SHUTTLE system provided more than 500,000 trips to disabled passengers with a private contractor providing 70 percent of these trips.[29] The PT system also provided interconnectivity with Sound Transit and Seattle to the north and Intercity Transit and Olympia to the south.[30]

[26] Community Transit. 2002 Comprehensive Annual Financial Report. Snohomish County, Washington. 2002.
[27] http://www.kitsaptransit.org/WorkerDriverBusProgram.html
[28] FTA, 2003.
[29] http://www.piercetransit.org/history.htm
[30] IBID.

3.5 Financial Characteristics

The seven partner agencies operated on a collective budget of nearly $810 million in 2003. The agencies collectively operated at an 80 percent subsidy, largely met with local funds (43 percent). In addition to local funds, state funds accounted for 15 percent of total operating funds, while federal and other funds accounted for 5 and 17 percent, respectively (see Figure 3).

In recent years, the local contribution has grown due to the 2000 repeal of the state's motor vehicle excise tax (MVET), which had formerly provided a significant source of revenue to the state's transit agencies. In separate elections, the citizens of King, Snohomish, Pierce and Kitsap Counties voted to increase local sales taxes in order to address the gap created by the MVET repeal.

The largest budget belongs to KCM, which operates at an annual budget of nearly $400 million, the majority of which (65 percent) is raised through local taxes and fees. The Washington State Ferry system is state operated and, thus, relies mainly on state funds and fares. Everett Transit is principally funded by the citizens of Everett. Sound Transit receives the vast majority of its operating revenues through a 0.4 percent local sales tax and 0.3 percent motor vehicle tax, which was authorized by Puget Sound voters in November 1996. The remaining partners (CT, KT and PT) are Public Transportation Benefit Area (PTBA) transit agencies operating on a mix of local, state and federal funds.

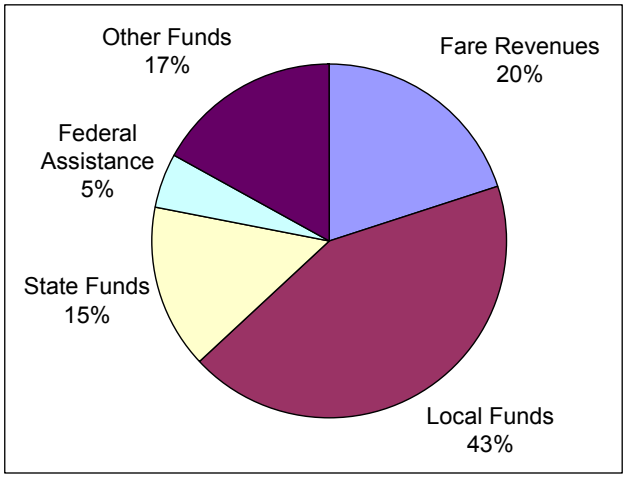

Figure 3. Source of operating funds.

3.6 Regional Context

As has been shown for the Central Puget Sound partners, agencies considering a regional fare card project are likely to differ in a number of key contextual factors including:

- Customer base: travel patterns and preferences, demographic size/characteristics, rural/urban character, income levels, preferences for cash vs. pass accounts;
- Regional geography: diversity, distances, connectivity;
- Agency size and services: number of vehicles, system miles (fixed route, demand responsive, vanpool), regional versus local service balance;
- Agency governance structure: political context, organizational structure, decision-making;
- Technology applications and needs: legacy systems, new technologies, in-house technical sophistication and capabilities;
- Existing fare structure: number of different fare types; and

- Existing market structure: number of institutional accounts with local businesses to support employee ridership, passes.

Each Puget Sound RFC partner agency brought this context to discussions about participating in the regional program. Each sought to achieve a partnering arrangement that reflected their specific situation, and avoided arrangements or compromises that could jeopardize its ability to maintain and expand a satisfied customer base of transit riders.

The smaller, more rural and isolated partner agencies generally serve lower income customers who have a strong preference for paying cash for their transit rides. These agencies were concerned that their customers would be uncomfortable with anything other than a pay-as-you-go fare system, and that their lower income customers would not be able or willing to pay the minimum amount needed to purchase a fare card.

These transit customers might only rarely take the long-distance, cross-jurisdiction transit rides that the regional fare card is particularly designed to facilitate. Customers of Kitsap Transit, for example, are largely dependent on the Washington State Ferry system (also a partner agency) for access to the urban centers of Puget Sound, thereby further complicating regional travel.

Each partner agency lobbied for its own interests and those of its customers. None wanted to risk losing customers because of the RFC program. For some of the smaller outlying agencies, the estimated costs of participation exceeded the benefits they thought they could derive.

Several factors were critical in overcoming these contextual issues.

1. Sound Transit promised compensatory funding to several agencies to offset potential losses from participation during the early years of the program. This served as a powerful incentive for joining in the partnership.
2. Equally important, however, was the value each agency placed on supporting regionalism. The agencies believed that their best interests, including those of their customers, would ultimately be well served by supporting the regional partnership.
3. The partners believed that a single fare medium would lower their costs and would be embraced by their customers for the seamless travel benefits it offered. Compensation from Sound Transit would cover the initial period during which the benefits of the new fare card could be promoted to and adopted by their customers, a process that agencies projected could take several years to accomplish.
4. The partners adopted a RFC organizational structure that allowed each of these contextual factors, and the issues associated with them, to be addressed in a tiered fashion, beginning with discussions among intermediate-level Subject Area Advisory Teams. Issues that could not be resolved at that level were elevated to higher organizational levels.

Lesson: Contextual Factors Affect the Potential of a Fare Card Project

- A regional partnership arrangement must be able to address the specific characteristics of individual partner agencies and their customers.
- Identified issues should be tracked and discussed following the organizational procedures endorsed by the partnership. Ultimately, the governing bodies of each partner agency must decide where they have flexibility to meet the requirements of partnership participation and where they need to stand firm in support of their agency's concerns.
- A cogent case needs to be made for the overriding value of regionalism. Factors that helped in the Puget Sound included funding that was made available to motivate participation and defray the early costs of entry, an experience base with an early and limited fare card program called Puget Pass, visits by RFC partners to the fare card experiment in the Bay Area, and support from the Washington State Legislature for meeting the interests of everyone in the region, a goal jeopardized by the prospects that some agencies might opt out.
- A RFC Governing Board (in the case of the Central Puget Sound RFC, the Joint Board) must operate with the best interests of the entire region in mind. Making decisions based on this ethic includes listening to the needs and circumstances (i.e., understanding the context) of each partner agency and seeking balance in decisions that affect the success of the program for the entire region.
- At a technical level, this means taking into account the technical sophistication of each agency, their legacy systems, and the hardware and software modifications planned or in place in ways that can work successfully for each partner as well as the whole regional system.

4. MOTIVATIONS FOR PARTNERSHIP

4.1 Introduction

The costs of the RFC Project are considerable in terms of both the monetary costs of the vendor contract as well as the time spent by the agencies in coordinating and developing the system specifications. It is natural to ask why an agency would choose to participate in the project. The answer to that question is different for every agency. This chapter describes each agency's motivations to participate in the project and highlights the lessons learned regarding issues associated with motivation that may be useful to others considering a fare card program.

4.2 Expected Benefits

The desire to improve customer service has been a driving force in the project from the very beginning. Most agency officials and project personnel interviewed during the evaluation believe that use of the fare card will offer significant advantages to commuters: it will avoid the need to carry cash or fumble with change, it will allow use of a variety of financial media (cash, credit cards, checks) to add card value, and it might decrease boarding time.

It is hoped that the fare card will be an advantage to the transit operators as well. Although not seen as a major source of cost savings for small and medium sized agencies, there will be less cash that needs to be manually counted and secured. The fare card may also reduce loses due to fare evasion and employee theft. In addition, the fare card will almost automatically provide improved data on transit patron travel patterns. The data could be used to better plan transit services and routes.

Because of circumstances unique to the Central Puget Sound region, Sound Transit will receive the greatest financial benefit from access to better data. Sound Transit bears the cost risk of the current Puget Pass program, but the new fare card will allow this risk to be shared among all of the participating agencies. The expected savings from that switch are enough that it was in Sound Transit's financial interest to subsidize the participation of three of the smaller agencies.

The details of the arrangement are as follows. Currently, all the agencies except Kitsap Transit participate in the Puget Pass Program. Monthly Puget Passes are available in a range of denominations in increments of $9, from $18 a month (equivalent to $0.50 per ride) to $144 a month (or $4.00 per ride). The Puget Pass is accepted at any of the agencies for its face value towards the fare. For example, if a rider has a Puget Pass with a denomination of $2.00, she can travel for no additional cost on Everett Transit, where the regular bus fare is $1.00. When she transfers to the commuter express bus operated by Community Transit, she will need to pay an additional $1.00 to cover the total $3.00 fare of the commuter bus.

In the absence of accurate data on actual inter-system transfers, Sound Transit redistributes the revenue received from the Puget Pass to each of the agencies based on the number of rides each

agency provided to Puget Pass Riders and the average fare per boarding received by each agency. Those statistics are calculated using annual or biannual rider surveys. Besides the expense of conducting these surveys, Sound Transit is responsible for making up any revenue shortfall between the revenue collected from the Puget Pass sales and the amount due to each agency based on the surveys. Once the fare card project is in place, revenue allocation will be based on the actual observed ridership patterns. After that, Sound Transit will no longer be responsible for financing any shortfalls. The cost of financing the shortfalls and conducting the rider survey was high enough that it was worthwhile for Sound Transit to provide a substantial subsidy to encourage the participation of three of the smaller agencies (Everett Transit, Community Transit, and Pierce Transit) in the fare card program. For the agencies, however, there is no guarantee that they will receive as much revenue from the Puget Pass under the new fare card regime as they receive under the current redistribution procedure. Nevertheless, each of the agencies stands to benefit from the more accurate redistribution of revenues anticipated under the RFC Project.

Another expected benefit of the RFC Project is increased regionalism. Many interviewees evoked this, but it was not easy to develop a clear definition. For some agencies, it means aligning and coordinating the various agencies within the region in order to have greater weight with the state legislature. In addition, some smaller agencies noted that joining the project might avert efforts to create a super-agency that would assume responsibility for all transit operations in the region.

4.3 RFC Project Goals

The agencies have prepared and adopted a more formal statement of the goals of the fare card project. Many of these goals are in fact statements of the benefits expected from the project. These project goals, as outlined below, will eventually be used as the basis for a self-evaluation.

Improve the Customer's Experience:

1. Implement the regional planning vision of "seamless" travel, which reduces barriers for customers to use more than one system by ensuring the technical capability to support "customer friendly" transfer and/or payment policies among all modes – bus, rail, (potentially) vanpool and ferries (walk-on and vehicle passengers and vehicle + driver).
2. Increase ridership and customer convenience by providing fare media that is convenient to purchase and use, and that can reduce customer security concerns (about carrying cash or a high value pass).
3. Reduce operator /customer fare disputes.

Improve System Operations:

4. Develop and install a smart card system that is accurate, reliable, low maintenance, and easy to use by customers, drivers, sellers and other transportation agency staff. The system must provide timely, complete and error free fare payment reconciliation among the agencies, based on patron use.

5. Improve the accuracy and timeliness of regional and local ridership data collection and reporting, which will enhance the quality of route/service planning and customer marketing initiatives.
6. Reduce passenger boarding times.
7. Minimize operator involvement with fare payment and simplify fare payment procedures.
8. Reduce the volume of physical cash and paper ticket payments.

Improve Project Management:

9. Deliver the project at, or below, budget.
10. Deliver the project on schedule.

4.4 Factors Supporting a Regional Partnership

By the decade of the 1990s, congestion was emerging as a serious problem in the Central Puget Sound region. The congestion was fueled by economic and population growth, a freeway system constrained by local geography and land use, and an increasing level of automobile use, especially single occupancy vehicles. People were traveling more and farther, and travel times were increasing. The Washington State Legislature felt that more should be done to develop the regional public transportation system and offer an attractive transit alternative. In 1992 it issued a "findings" that led to the establishment of the Regional Transit Authority (later to become Sound Transit) to take leadership in seeking solutions to the region's transportation issues, and it said, in part, that

> "…existing transportation facilities in the central Puget Sound area are inadequate to address mobility needs of the area. The geography of the region, travel demand growth, and public resistance to new roadways combine to further necessitate the rapid development of alternative modes of travel."[31]

The Legislature encouraged King County Metro and other transit agencies to work together to address congestion and mobility problems. The perception was that these agencies were not meeting traveler's needs because they had poorly integrated policies and products and were not taking advantage of new technology.

King County Metro, the largest transit agency in the region, wanted to pursue new technology, while other agencies were more cautious. Some had made technology investments that turned out to be costly failures and this, together with problems encountered elsewhere with early fare card systems, reinforced a sense that the prudent course was to let others test the systems before adopting them in Puget Sound.

In 1996, Sound Transit was created with a charter that included integration and coordination of transit services across transit agencies in the region. A few years later, it led the creation of the Puget Pass fare program. This established a foundation and experience base on which to launch

[31] [1992 c 101 § 1.]; 81.112.010; Findings—Intent.

the current RFC Project. Many feel that the RFC Project would not have been possible without the precursor Puget Pass program.

Sound Transit also underwrote the participation of several of the partner agencies in Central Puget Sound, and this helped convince them to join the RFC Project. Each agency conducted its own analysis of the costs and benefits of participation and several found that the costs exceeded the benefits. They nonetheless decided to join because of a desire to support what was best for the region, because they did not want to fall behind technologically, and because they felt it would be more costly to enter the project later than at the beginning. Other perceived benefits included enhanced customer service, reduction in fraud and collection costs, reduced burden on bus operators, more equitable revenue distribution, and the potential for new revenue streams.

Public transportation agencies are strongly motivated to seek ways to increase ridership. The RFC Project has the potential to attract new riders as well as retain existing ones. Its smart card technology can also be used for purchases other than transit fares, and this marketing potential constitutes another incentive for adoption. The RFC Project has sought to engage a private sector partner, such as a financial organization, to support retail applications for the fare card. However, the Joint Board has made it clear that this does not fall under the current scope of the RFC Project, but rather should be viewed as a potential benefit to be achieved after successful implementation of the new fare card system.

Fare card technology is not without its costs and risks. The RFC agencies worry about issues such as the long-term financial viability of the system vendor and the level of support they will receive. They wonder if the system will become obsolete. They are concerned about accommodating their specific fare structures within a coordinated regional framework. While they value the prospect of a more rational and efficient fare reconciliation system, they are uncertain about its financial impact on them.

The new technologies have to be integrated with a variety of legacy systems in transit vehicles and agency back offices. This presents different sets of challenges in each agency. Challenges include ensuring that the systems will work compatibly together, and that operators, managers and maintenance staff will be comfortable with them and have the requisite skills to use them effectively.

A bottom line lesson from the RFC Project in all these tradeoff considerations is that it takes more time, patience, and flexibility than can possibly be anticipated at the outset to arrive at a workable partnership that effectively balances the needs of the region with the needs of each agency. The RFC partner agencies in Central Puget Sound have decided that this has been worth their efforts.

Lesson: Motivate Support for a Regional Fare Card Program

- State legislatures are in a good position to recognize the value of a fare card program in addressing travelers' needs for an efficient, cost-effective, seamless public transportation system. In the case of the Central Puget Sound region, the state legislature provided the initial force that helped motivate the transportation agencies to focus on finding solutions to the region's mobility problems.
- One or more of the key partners in a regional fare card program can take a leadership role as an early adopter of new technologies. Such partners are likely to be in the strongest position to assume the risks associated with the technology and can serve as a test bed, an example, and a resource to the other candidate partner agencies
- The Central Puget Sound region has benefited tremendously by having several precursor fare pass programs implemented on a limited basis. They increased riders' familiarity and comfort with alternative integrated fare media, and demonstrated the value and viability of such a system. While some areas around the country may not be able to begin with a small-scale implementation of a pass or fare card system, the value of that approach in generating support for the eventual RFC program in the Central Puget Sound was clearly demonstrated.
- Some mechanism to underwrite the costs and liabilities for smaller agencies to join a regional fare card partnership may be the only way to assure full participation from all agencies at the start of such a program. Riders need to be convinced of the value of participation, and institutional players need to be brought on board.
- A regional fare card offers more uses than just transit rides. These cards have the capability to be configured and used by customers to pay for a variety of goods and services in addition to transit. This is expected to increase the utility of having a card and motivate participation.
- Agencies promoting the use of a regional fare card need to understand the issues and concerns of potential partners, respond to their concerns, and demonstrate the value of the fare card program.
- The regional partners need to understand thoroughly the potential impacts of the introduction of fare card technology on their existing systems and technologies. They must also take account of other new systems that they may be planning to incorporate into their systems and vehicles. This will include the conduct of human factors studies and the involvement of their operators in determining what will or will not work well for the agency. These findings must then be addressed from the perspective of the regional partnership to determine how to specify the design requirements for negotiation with the system vendor.

5. RFC PROJECT TIMELINE

5.1 Introduction

The previous chapter discussed the benefits of a regional fare card system. This chapter reviews the progression of the RFC Project, from discussions of the initial concept to its current level of development, and reviews the events that shaped its development and the factors that motivated partner participation. This chapter provides a detailed chronology of events for the project and this evaluation, and offers a discussion of the more important milestones along the timeline.

5.2 Emergence of New Technology

The initial thinking on the RFC Project dates back more than 10 years to 1994, when King County Metro was Seattle Metro, before it merged with King County. Seattle Metro was designated by the region as the agency to lead the planning effort to identify strategies and appropriate technologies to improve regional fare coordination. With regard to the use of fare collection technology as a solution to replace paper fare media, the choice was between magstrip (magnetic stripe), which was being introduced around the country; or smart card, a relatively unproven technology at the time. The interest in smart card technology was increased because at that time the Metropolitan Atlanta Rapid Transit Authority (MARTA) was investigating smart card applications for use in the upcoming 1996 Olympic Games in Atlanta. In 1995, Seattle Metro commissioned a technical feasibility study to evaluate the two technologies. The Regional Fare Integration Planning Team issued a report titled *Regional Fare & Technology Integration Feasibility Study* that concluded smart cards offered greater benefits in usability and reliability compared with magstrip technology. They recommended the implementation of a contactless smart card fare collection system for deployment in the Puget Sound region.

5.3 Moving Towards Regionalism

An institutional factor that contributed to the interest in new fare technology was a growing commitment to transit regionalism in the Central Puget Sound area. As noted earlier, in 1992 the state legislature in Olympia passed a law requiring the formation of a Regional Transit Authority (RTA) comprised of three counties in the area: Pierce, King and Snohomish. The RTA later became known as Sound Transit when, in 1996, voters in the three counties approved the "Sound Moves" regional transit plan. The plan encompassed $3.9 million worth of bus and rail service improvements in the region.

A key reason for the legislature's interest was the increasing highway congestion throughout the region. It was felt that longer distance commuting trips in the region were not being well served

by the transit agencies, so that these travelers had no viable option other than to use private passenger vehicles and add to the congestion.[32]

As part of its voter-approved mandate, Sound Transit is responsible for facilitating regional travel. A regional fare system was seen as a necessary condition for fulfilling its plan, and Sound Transit's creation put renewed interest and resources into the RFC Project.

A Regional Fare Coordination Planning Team was created. It consisted of people from all the agencies including the RTA and the Puget Sound Regional Council. The Cascadia Project was interested in the project as a representative of AMTRAK to create a corridor from Eugene, Oregon to Vancouver, BC where one fare medium could be used on all public transit. However, Cascadia staff did not actively participate in the planning process. The team retained the IBI Group to prepare a business analysis / feasibility study that would "present a summary of a business needs assessment and feasibility analysis for a new smart card fare collection system." The *Regional Fare & Technology Coordination for Central Puget Sound: Final Report Phase I Feasibility Study* was submitted on January 15, 1996.

This report identified the following potential benefits of a regional fare card coordination project:

- Improved collection of ridership and revenue data,
- Workload reduction and improved safety for operators,
- Customer convenience,
- Opportunity to expand employer programs,
- Additional retail opportunities, and
- Increased ridership.

5.4 Business Community Interest

Even before the study was completed, the Regional Planning Team approached corporate entities in the region to gauge corporate interest in the smart card concept as a mechanism to provide transportation benefits to their employees. In addition, the Team received funding from the Boeing Company via the City of Everett Transportation Mitigation Fund. Boeing and many other corporate interests also provided non-monetary assistance by actively publicizing their support for the initiative and thereby swaying some political elements in the region.

5.5 Financial Planning

Planning for funding sources started very soon after initial technology investigation. By 1998, a finance plan was beginning to take shape, and the partner agencies had completed a business

[32] In fact, there actually were express buses serving the outer areas of the region. There were also some between-agency passes (generally manual-type paper tickets), arranged through bi-lateral agreements, that facilitated convenient transfer between systems. One example of this was ship-to-shore passes between the Washington State Ferries and Metro.

requirements study that outlined a preferred operating concept, customer service business rules and conducted a system benefit-cost analysis. In early 1999, the partners issued a procurement plan and RFP. Later that year, however, Washington voters repealed the state's motor vehicle excise tax (MVET) which significantly jeopardized funding for transportation improvements. As a result, the procurement was suspended and partner agencies turned their attention to filling the funding gap in current operations and finding new sources of funding for the RFC Project.[33]

Following passage of the MVET repeal, the Washington Legislature enacted legislation authorizing local governments to ask voters to raise sales taxes dedicated to public transit up to 0.9 percent. In recent years, voters in King, Snohomish, Pierce and Kitsap counties have approved increases in local sales taxes to aid local transit districts. Even with the passage of local sales tax enhancements, as noted earlier several partners were struggling to make the business case before ST agreed to fund a portion of these partners' fare card system capital costs not covered by grants, and two years' operating costs. As examined in Section 8.5 of this report, ST's contribution will replace a current commitment to subsidize agencies participating in the Puget Pass system.

More than 10 years after initially commencing financial planning, the partners have designed a finance plan that includes 12 federal grants (e.g., Federal Section 5307, Congestion Mitigation and Air Quality, ITS Earmarks), local sources, contributions from the partner agencies' capital budgets, and a corporate grant from Boeing via the City of Everett Transportation Mitigation Fund. Approximately 48 percent of the estimated capital budget of $42.1 million is funded with federal, local and corporate grants totaling $20.2 million.

5.6 RFC System Specification Development

The RFC Project is built on an extensive history of early developments that help pave the way for implementation (Table 3). Two precursor fare pass programs were implemented in the Puget Sound region in the early and mid 1990s: U-Pass and FlexPass. U-Pass was established in 1991 with the primary objective of reducing the number of students, staff and faculty driving alone to the main campus of the University of Washington in Seattle. Riders were provided with a pass that offered a variety of benefits, including not having to pay cash for their rides, and an unlimited number of rides on King County Metro, Community Transit and Sound Transit buses. The success of this program led to the development of FlexPass, a similar system that is now in use by over 130 major employers in the Puget Sound region. FlexPass was the first employer-based program of its kind in the nation.[34] While these programs did not use electronic fare cards, they provided many travelers in the region with experience using a single fare pass valid on buses across multiple agencies.

The Regional Planning Team, which comprised staff from all seven transit agencies operating in the central Puget Sound area, was tasked to develop a coordinated fare system within the region.

[33] The MVET was projected to raise $1.5 billion in revenues during the 1999-2001 biennium, with 29 percent dedicated to local transit districts.
[34] http://www.metrokc.gov/exec/news/2001/0523012.htm

This group commissioned a smart card demonstration project that took place from October 1, 1996 through March 31, 1997. The demonstration had the following goals:

- Solicit customer and operator feedback;
- Test technology in revenue and non-revenue operations. A particular goal was to analyze the impacts of high levels of electromagnetic energy in ferry and trolley bus applications, and to assess the capability of the technology to operate in the typical public transportation environment;
- Raise awareness of the project among customers, transit agency staff, media, policy makers, and the general public; and
- Identify customer and driver needs and issues for consideration in project design

Smart cards were distributed to 144 customers (57 on KCM, and 87 on Pierce Transit), with on average 100 cards in use each month due to attrition and recruiting. Equipment was installed on four routes each of KCM and Pierce Transit. The technology consultant IBI performed an evaluation of the demonstration based on survey responses from customers and focus groups involving both customers and operators. Among other things, the demonstration evaluation found that:

- 15 tests conducted to test for Radio Frequency and/or electro-magnetic interference were passed;
- Customer focus-group participants rated the system 7.3 out of 10. Drivers gave the system an average rating of 7.6 out of 10;
- 70 percent of survey respondents stated they would use the card on more than one system;
- Even though all but one of the survey respondents identified themselves as pass-only riders, the ability to store cash value or rides on the cards was of high interest; and
- The single most important characteristic of the concept to focus group participants was its ability to work across the different systems.

King County provided the administrative lead for the procurement process, meaning that the team used King County's procurement protocols and administrative resources. At the time the RFP was issued to solicit vendor candidates for the regional fare card hardware and software (February 1999), the agencies were already committed to establishing the Puget Pass Program, which formally began operations in September of that year. The RFP noted that smart card technology was to be the basis for improving the revenue reconciliation process. Two proposals were received but only one was deemed responsive.

Table 3. Regional Fare Coordination project and evaluation milestones.

1991	U-PASS created by University of Washington and King County Metro
1994	Commence planning/adopt regional objectives
1995	Fare collection technical alternatives analysis study (magnetics vs. smart card)
	Commence finance planning initiatives – now 12 federal grants, Boeing, ST and other local funds
1996	Business analysis / feasibility study – key drivers: regional fare complexity; institutional account support; administrative and maintenance efficiencies
	Sound Transit established (November)
1996-97	Smart card equipment prototype demonstration – Pierce Transit and King County Metro buses
1997	Value engineering study – independent expert review
1997-98	Business requirements study – e.g., development of the preferred operating concept, customer service business rules and cost-benefit analysis
1998	RFP systems specification development
1999	RFC procurement plan issued (February)
	RFP issued – 2 responses (February 16)
	Washington Legislature amends public disclosure laws (RCW 42.17.310) to exempt personally identifying information of those who purchase transit passes and other fare media, including smart cards, from public disclosure requirements (April)
	Puget Pass organized by Sound Transit; system begins operation (September)
	I-695 passed by Washington voters, repealing the state motor vehicle excise tax (MVET) and reducing available funding for the RFC Project (November 2)
1999-00	Procurement suspended due to passage of I-695 (December 1999 to August 2000)
2000	Washington Legislature repeals MVET (March 31)
	I-695 declared unconstitutional by the Washington State Supreme Court (October 26)
	Issued request for revised proposals (November 8)

Table 3. Regional Fare Coordination Project and Evaluation Milestones (continued)

2001	FTA designates the Central Puget Sound Project as an ITS evaluation test site for automated fare collection with focus on agency organizational relationships
	Procurement resumed
	Issued request for best and final offers from vendors (June 15)
	RFC ITS evaluation team conducts preliminary site visit (December 20)
2002	Contract and Interlocal Agreement negotiations
	Issued request for revised best and final offer (June 7)
2003	ITS evaluation study kickoff meeting (February 12)
	Interlocal Agreement and vendor contract approved by all 7 participating agency governing bodies
	Interlocal Agreement signed by all 7 project partners -- King County Metro Transit, Community Transit, Everett Transit, Kitsap Transit, Pierce Transit, Sound Transit, Washington State Ferries (April 29)
	Vendor contract signed by all 7 project partners. (April 29)
	ITS evaluation strategy issued (June 24)
2004	Conceptual Design Review—CDR (April 7)
	Pre-Membership Agreement (Final, April 26)
	ITS evaluation team meets with partner agencies (June 7-17)
	ITS evaluation team meets with RFC Regional Team (July 8)
	ITS evaluation team meets with Joint Board members (October 18-20)
	Preliminary Design Review—PDR (November 15)
2005	Final Design Review—FDR (September 2005)
2006	Revenue service operational test (3rd Quarter 2006)
2007	Full system installation (1st, 2nd and 3rd Quarter 2007)
	Final Acceptance Testing (TBD)
	Full system revenue service operations (4th Quarter 2007)

Sound Transit took the lead in creating the Puget Pass system. The Puget Pass system was put in place only as a stepping-stone to the smart card-based fare integration system. A region-wide agreement among five transit agencies provided transit riders a one-ticket fare system (though not a single regional fare structure) with seamless transfers on regional bus, commuter rail and light rail services. Puget Pass represented Sound Transit's fulfillment of both a commitment in its ballot initiative as well as a contractual obligation to the Washington State legislature to support regionalism in Puget Sound. This system also ultimately benefited the RFC Project because many of those who participated in negotiating the terms of the Puget Pass program also participated in the early deliberations and development of the RFC Project. The governing group responsible for Puget Pass evolved into the Joint Board governance structure that now manages the RFC Project. The difficulty and cost of reconciling revenues in this paper-based system also focused the attention of potential RFC Project partners on the advantages of electronic fare media in this regard.

Agency representatives interviewed for this evaluation noted that the Puget Pass system provided an opportunity to work out the policy issues inherent in a coordinated regional fare program without also having to address the technology issues related to smart cards, and that the Puget Pass system contributed significantly to the subsequent development of the RFC program. They believed that it would have been overwhelming for the partner agencies to try to grapple with both types of issues at one time. Additionally, the Puget Pass system was a way for Sound Transit to deliver in a timely manner on its charter to champion regional transit. Waiting for the technology issues to be worked out would have severely delayed its mission.

Even though the Puget Pass system is quite successful from the rider's viewpoint, it is very costly to administer, and those costs fall on Sound Transit in a variety of ways. First, Sound Transit is responsible for collecting the data required to perform the fare reconciliation needed as part of the Puget Pass system.[35] Currently, those data are obtained from ridership surveys that are costly to carry out and analyze. Second, the Puget Pass agreement places the risk of the system on Sound Transit. That is, if not enough revenue is received from sales of Puget Passes to cover the price of providing the rides used on the Puget Pass (as measured by the average fare per boarding), then Sound Transit is required to make up the difference from a fund set up for that purpose.

For these reasons, Sound Transit has a strong incentive to phase out the current Puget Pass system in favor of a smart card system. Under a smart card system, agencies will receive their appropriate portion of the revenue from the use of regional pass fare products. That portion will be determined by actual ridership data generated automatically by the operation of the system.

In 2000, the motor vehicle excise tax (MVET) was rescinded, resulting in a halt to transit funding. The fare card procurement process was halted for about a year as the partner agencies sought to identify new funding. Communities had to levy new local taxes to replace the lost revenue.

[35] Fare reconciliation is the process of distributing revenue from Puget Pass purchases back to the operating agencies.

In November 2000, the agencies requested revised proposals from the ERG and CDS NET teams. In June 2001, the agencies requested "best and final" offers. Also in 2001, the FHWA designated the Central Puget Sound Project as an ITS evaluation test site for automated fare collection with focus on agency organizational relationships and governance processes. This report presents the findings from that evaluation.

The year 2002 saw the negotiation of the vendor contract and the development of the Interlocal Agreement (ILA) among the agencies. Both the contract and the ILA were signed in 2003. Following the signing of those two documents, the Joint Board began meeting, agency Site Managers were hired and system design began. The design development and review processes have continued through 2005.

5.7 Value of Implementing a Precursor System

The Central Puget Sound RFC Project has benefited from having first hand experience with several transit fare pass programs over the past decade. While these were implemented to provide immediate benefits to transit riders, it was understood from the start that they were temporary systems – interim steps on the way to a comprehensive regional fare card system. These early fare systems provided invaluable experience that laid the foundation for the RFC Project, giving passengers, system operators and transit agencies a chance to learn about these systems and to identify and resolve some of their issues before committing to a full scale, region-wide fare card system.

The lessons here point to the value of moving in a step-wise fashion toward the development of a full regional fare card system, building upon the experiences gained from less ambitious fare programs that have some elements in common with a full system. Whether precursor fare systems are always needed is a matter of judgment, although their value in helping participants "get on board" with the concepts and challenges cannot be overemphasized. Agencies in other parts of the country can now develop their fare card programs by building on the experiences of the Central Puget Sound RFC system and other more fully developed projects. The challenges are to understand the similarities and differences between regions, and how those differences might suggest adjustments in approach and implementation. A regional fare card project needs to be tailored to the needs, capabilities, customer base and institutional context of each region. However, the general themes exhibited in the Central Puget Sound RFC Project can be expected to be relevant for most other situations involving multiple agencies and systems.

Some lessons from Puget Sound's experience with several precursor fare systems include the following:

Lesson: Recognize the Value of Precursor Fare Pass Programs

- Before implementing a region-wide electronic fare card system, initially deploy a limited fare pass program, such as one for a university, to give transit riders a chance to get used to it. This also benefits the agencies by helping identify and resolve potential problems or obstacles to full implementation.
- Tap the experience of participants in these precursor fare pass programs when designing a comprehensive, region-wide fare card program. Where possible, select individuals who were instrumental in designing and operating the limited systems for governing positions in the region-wide fare card program.
- Proceed deliberately in a step-wise fashion from more limited applications to more complex regional applications. However, as these systems mature across the country, adopting an appropriate existing regional fare card model may be a perfectly viable alternative strategy to the step-wise approach.
- When considering implementation of a regional fare card system, take account of local needs and context, and assess the potential value of implementing an interim, smaller scale fare system to help understand the challenges and get participants on board with the concept. Alternatively, use the Puget Sound experiences, and the fare card experiences of other locations, and the lessons learned and seek to adapt those lessons to the local context and needs.

6. GOVERNANCE, COMMUNICATIONS AND DECISION-MAKING

6.1 Introduction

There are a number of ways that a regional fare card program could be organized and managed, and the governance model that is selected affects every aspect of program development and defines the roles and experiences of the participants. This chapter begins with a description of the central governing contractual arrangement that guides the development of the RFC Project, namely, the Interlocal Agreement. It then addresses the key components of the RFC Project's organizational structure and the roles and responsibilities of the major participants.

6.2 Governance

6.2.1. Interlocal Agreement

The "Interlocal Cooperation Agreement for Design, Implementation, Operation, and Maintenance of the Regional Fare Coordination System" (ILA) was signed on April 29, 2003 by the chief executive of each of the partner agencies.

The ILA defines the governance structure of the project and specifies how decisions regarding the project are to be made. It describes the responsibilities of the partner agencies, the Joint Board, and the Project Team (summarized below). The ILA also lays out a Contract Administration Plan and a Finance Plan including a project budget. In addition, the ILA specifies the requirements for an agency to join or to withdraw from the RFC Project.

The ILA specifies that the project will be operated under a consensus model. That is, all partners must agree on a decision for it to be adopted, and every agency therefore has veto power. This arrangement differs, for example, from the governance structure of the TransLink® regional fare card project in the San Francisco Bay Area. There, the Metropolitan Transportation Commission (MTC) acts as the lead agency among a group of 23 partner agencies. The MTC manages the project and ultimately makes the major decisions regarding the program.

Personnel at most (if not all) of the smaller RFC Project partner agencies indicated that a consensus governance model was a requirement for their participation. Nonetheless, King County Metro (KCM) does have substantial *de facto* influence in the RFC Project's decision-making process. This influence arises because, as the largest and most complex agency, its needs define many of the RFC system requirements. KCM also contributes more resources and assumes more responsibilities than the smaller agencies.

It should be noted that prior to the adoption of the final ILA in April 2003, the partner agencies coordinated a great deal on regional transportation issues. One of the first groups concerned with

regional transportation issues was the "regional planning team," which consisted of staff from all seven agencies. This group was tasked to develop a coordinated fare system within the region under the RTA, and its work led to the smart card demonstration project that took place from October 1, 1996 through March 31, 1997. Previous versions of the ILA helped guide the earlier phases of the project.

6.3 Committees/Boards Set Up by the ILA

6.3.1. Joint Board

The ILA designates the Joint Board as the project's executive decision-making body. The Joint Board is comprised of heads of each of the partner agencies: the General Manager, CEO, or Executive Director. Each agency also selects alternate representatives in the event that the Board Member is unable to attend a Joint Board meeting. Quorum for a Joint Board Meeting consists of the majority of Board members.

The Joint Board is responsible for project oversight and contract administration. With regard to RFC Project governance, the Joint Board has the following responsibilities:

- approval of amendments to the ILA;
- contract awards and terminations;
- budget approval;
- approval of uniform agreements developed by Project Team, such as card holder agreements, institutional account agreements, and third party retailer agreements; and
- approval of addition of new partners and approval of terms of withdrawal of partners

The Joint Board may delegate other responsibilities relating to project oversight and contract administration to the Project Team (described below).

As noted above, most Joint Board decisions require unanimity. However, the ILA provides for majority rule regarding two types of issues: 1) termination/replacement of the project Contract Administrator; and 2) approval of change orders with value greater than $50,000 but less than $100,000.

Importantly, the Joint Board is not a legal entity. It does not contract with outside consultants or with the system vendor. It cannot hire legal counsel in its own name. The KCM Prosecuting Attorney's office has been available to consult with the Regional Team, but ultimately, each agency can only receive legal advice from its own legal counsel. The only legal entities in the RFC Project are the partner agencies.

6.4 Project Team

The Project Team consists of:

- the Contract Administrator;
- the IS/Technical Manager;
- the Budget and Contract Control Manager;
- agency Site Managers; and
- the Project Assistant.

The Contract Administrator is nominated by King County and approved by the Joint Board. The Contract Administrator manages the contracts with the system vendor and any Joint Board consultants. The Contract Administrator is empowered to make project decisions on issues that are not specifically assigned to the Joint Board or to the governing bodies of the separate agencies.

Members of the Project Team, except for the agency Site Managers, are employed under the terms and conditions of King County and their offices are in the King County Metro office site. They act on behalf of and at the direction of the Joint Board. They do not have any responsibilities outside the context of the fare card project; all of their time is dedicated to the project.

Site Managers are selected and employed by their respective agencies and follow the direction of their own Agencies. With one exception, the Site Managers devote all of their time to the project. The Everett Transit Site Manager took on the Site Manager responsibilities in addition to his existing responsibilities.

6.4.1. Contract Administrator

As stated in the ILA, the primary responsibility of the Contract Administrator is "overall project management." This differs from the functions implied by the job title, and several people we interviewed commented on the tension between the two roles. Because the head of the Project Team is a Contract Administrator, it has been noted that contracting issues seem to drive the project development. An alternative approach would have been to designate a traditional Project Manager who is tasked with overall project planning and implementation, and having contract administration as an important sub-task. The Contract Administrator is a key position on the project.

The ILA lists the Contract Administrator's responsibilities as follows:

- to serve as a single point of contact for the consultants and the vendor (as clearly specified in the ILA);
- to provide administrative coordination to the Joint Board and the agency Site Managers;
- as directed by Joint Board, to identify and recommend revisions to the RFC Project scope, schedule, budget and finance plans, and to agency business rules;
- to facilitate development of the RFC Project rollout plan; and

- to facilitate development of uniform agreements to be used by the agencies, such as cardholder agreements, institutional accounts, and third party retailer contracts.

6.4.2. Regional Technical Manager

The Regional Technical Manager works closely with and supports the Contract Administrator on the Regional Team in guiding the project management strategy. As presented in the ILA, the Regional Technical Manager's responsibilities include the following:

- provide Contractor and Agency technical coordination with regard to design, development, implementation, test, delivery and operation of the RFC System;
- monitor Contractor and Agency technical performance and compliance;
- monitor and report on RFC Project schedule;
- conduct regular meetings with the Contractor and Agencies to identify and track technical issues;
- identify, revise and develop new technical requirements as may be needed;
- identify and document the need for revised or new Agency Business Rules; and
- coordinate technical contract deliverables, change orders for appropriate approvals, and Contractor Requests for Information (RFI).

Lesson: Consider Whether to Hire a Consultant

The design and implementation of a regional fare card system involves a considerable amount of detailed information. The information concerns technical aspects of fare card system hardware and software technologies, as well as organizational and administrative knowledge regarding proven ways of integrating a fare card system within existing transit agency structures and processes. Whether the agencies decide to procure a customized system, go with "off the shelf" technologies, or make some adjustments to available hardware and software, the breadth and depth of information that must be assembled and mastered can be overwhelming.

The Central Puget Sound Regional Fare Coordination System partner agencies addressed this problem by retaining the services of a consultant specialized in ITS technologies and fare card systems in particular. The consultant has worked with the partner agencies from the beginning of project development. The consultant has supported the preparation of the various project milestone documents including the report on the assessment of alternative technologies, the project Request for Proposals and the vendor contract.

The consultant was hired to be a project-wide resource, responsible to the Joint Board. However, even when the consultant spent time working with an individual agency, there were opportunities for the knowledge to be transferred to other agencies through inter-agency contacts via Subject Area Advisory Team (SAAT) meetings and other meeting occasions. The collaborative atmosphere established between project partners facilitated this knowledge transfer., and the partner agencies valued the contributions of the consultant to the development of the RFC Project.

An additional role being considered for the consultant in the RFC Project is as a Project Manager, though no decisions has been made regarding this or other possible project management alternatives.

6.4.3. Agency Site Manager

Each partner agency appoints its own project Site Manager. As specified in the ILA, the primary responsibilities of the Site Managers are:

- to serve as the agency's primary point of contact for the contract administrator, joint consultants, and the vendor;
- to advise the Project Team on project status, technical options and implications for the individual agency;
- to coordinate agency efforts to meet contract requirements;
- to coordinate agency review of the RFC system functional and detailed design; and
- many other secondary responsibilities.

Every Site Manager we spoke to indicated that the position carries a significant burden of time and responsibilities. All agencies except one have created a new full time position for the Site Manager. The Site Managers spend considerable time attending internal agency meetings, as well as meetings of the SAATs and Joint Board. Like the Contract Administrator, the Site Managers must direct, coordinate, document, and communicate RFC Project activity occurring on many fronts both within their agencies and at the regional level.

6.5 Committees and Boards Not Created by the ILA

6.5.1. Agency Governing Bodies

The ILA preserves the autonomy of the individual partner agencies. While the Joint Board has authority over issues directly related to the contract administration, each agency's governing body (usually its board of directors) retains control over many other project issues. For instance, the agencies recognize that having consistent policies for child, student and senior discounts will aid the move to regionalism. However, the governing bodies of each agency still have the final say on those policies, not the Joint Board.

In addition, the governing bodies of each agency have an interest in the activities of the project, and may request project status and issues updates directly from their respective Joint Board members, Site Managers and other RFC Project personnel.

6.5.2. Subject Area Advisory Teams (SAATs)

The ILA does not mention Subject Area Advisory Teams or SAATs. KCM introduced the concept of the SAAT in the RFC Project structure. These working groups bring together people with specialized expertise to resolve topical issues related to particular aspects of the project. At the time of writing this report, there were twelve SAATs covering the following areas:

1. Customer Service
2. Project Evaluation
3. Marketing
4. Finance
5. Institutional Accounts
6. Fares
7. Retail Sales
8. Technical
9. Vanpool
10. On-board System Integration
11. Operations, and
12. Reporting and Data Management

New SAATs can be created as the need arises.

SAAT members are drawn from all the partner agencies. Although agencies are not required to place personnel on each SAAT, in practice they generally do so in order to stay informed about current issues and be able to influence developments in each of these important subject areas.[36]

Soon after the ILA was signed, the agencies requested the vendor to send personnel to attend the SAAT meetings and serve as an information resource. This was an unexpected cost to the vendor. Feedback during our interview process indicates that, in practice, vendor personnel are not always effectively utilized in these meetings, in part because the content of the discussions cannot always be determined in advance, so the most appropriate vendor personnel might not be present.

Agency Site Managers and the Contract Administrator also attend the SAAT meetings when their schedules allow. Their role there is to share information, such as pertinent developments of other SAATs, as well as to gather information to guide the direction of the project. Site Managers also see their participation as an opportunity to facilitate a focused discourse.

One of the major SAAT activities consists of formulating recommendations for the creation of business rules for the RFC Project. Business rules govern the many detailed aspects of the business activity of the project as it goes into deployment. Rules specify how agencies interact with one another, such as the form of reports that will list interagency traffic, and how the costs of refunding a card will be absorbed. Business rules are also vital to specifying the service product the transit rider will experience. For instance, some business rules state that a customer will be able to view their account balance and 30 day history via the Web site. There are a very large number of such rules, and identifying and finalizing them has been very time-consuming.

Initially, SAAT members were sometimes frustrated because of poorly defined roles. Statements of Work (SOW) that defined the purpose and function of each SAAT were developed roughly a year after the ILA signing. Sometimes agencies assigned junior personnel to the SAATs who were not empowered to make decisions. This could delay decision-making, as these members would need to communicate with their home agencies before committing to a decision. The most effective SAATs proved to be ones where the head of the SAAT had the support of his or her home agency to devote sufficient resources to leading the SAAT.

The SAATs are not decision-making bodies. They formulate recommendations that may be accepted or rejected by the Joint Board, which has the final decision making responsibility.

[36] An exception is Everett Transit, which does not operate vanpools and therefore does not have people on the vanpool SAAT.

6.5.3. Senior Staff Advisory Group (SSAG)

This group is comprised of the Joint Board Alternates. Each member is a senior manager in his or her own organization. The SSAG is not mentioned in the ILA, nor does it have a formally designated scope or purpose. In practice, the group provides policy guidance and review of all items scheduled for Joint Board approval or action.

6.6 Uniform Agreements

The ILA calls for the Joint Board to create and approve uniform agreements to govern the relations between the agencies as a group and other parties. These agreements include:

- the cardholder agreement, which informs the cardholder of the all fees, terms and conditions of the card and its features (e.g. balance autoload, balance protection, refunds and account history viewing);[37]
- the third party retail revalue agreement, which informs retailers about the terms and conditions that concern the provision of fare card revaluation service;
- institutional account agreements, which inform organizations about the benefits, fees, terms and conditions for participating in programs whereby they provide their employees a transportation subsidy and distribute fare cards to them;
- the license to use the transit application - to inform the fees, terms and conditions of using the RFC Transit Application between Card Issuer and RFC Agencies.
- agreements governing third-party applications loaded on the RFC card, which inform non-transit organizations (e.g. a coffee vendor or the municipal parks system) about the fees, terms and conditions that relate to loading a third party application on the RFC card;
- public records disclosure agreements, which ensure timely, coordinated and consistent procedures among the partner agencies for handling of public information requests and for protecting customer and system data from unauthorized disclosure;
- uniform fare collection and customer services practices *("System Operating Procedures")*, that specify all system-wide operating policies, procedures, and business processes;
- pre-membership information materials for public transit agencies and private transportation service providers, that inform transit agencies and transportation providers who are potentially interested in joining the RFC system about the fees, terms and conditions of joining;
- regional credit card transaction fee agreements, that establish a uniform customer credit card fee structure among the agencies and ensure that customers are charged consistent fees at all agency-operated customer service locations;
- regional fare policies; and
- agreements on the uniform treatment of confidential materials, that define a uniform set of agency practices for the treatment of vendor trade secrets and/or other confidential materials.

[37] This agreement also includes the Data Privacy Policy, which informs the customer of what data are collected, how they are used, who has access to the data, and other aspects of data privacy.

6.7 Procedure for Removal or Addition of Agency to Project

The ILA provides for its own complete termination by the Joint Board following a unanimous vote of all agency representatives. It also provides for individual agencies to withdraw from or to join the RFC Project.

In order to withdraw from the project, the ILA requires an individual agency to submit a report to the Joint Board that explains:

- the reasons for withdrawal;
- the alternatives to withdrawal that the agency considered;
- the probable impacts on the remaining agencies individually and collectively;
- the probable impacts to the RFC contract scope, budget and schedule; and
- a proposed work plan of actions necessary to accomplish the withdrawal.

The Joint Board then reviews the report, and presents its own report to the Governing Board of the withdrawing agency. The Joint Board report should cover the same issues as the original agency report, and either include a work plan to affect the agency's withdrawal, or propose alternatives to withdrawal. The agency Governing Board then decides whether to accept the terms and conditions of the Joint Board, including payment by the withdrawing agency of reasonable RFC Project costs that arise because of the withdrawal.[38]

After a withdrawal, an agency should release any of its project grant money to the remaining agencies, and should reimburse the FTA for any grant money received.

The ILA does not specify detailed terms and conditions governing an agency joining the RFC Project. The ILA states that the Joint Board would need to approve those terms and conditions and that the cost allocation procedures can be modified to allow for the addition of a new partner agency. In April 2004 a final version of a pre-membership agreement was issued, and it details the responsibilities and membership requirements of prospective member agencies seeking to join the RFC Project.

[38] Washington State Ferries received special consideration as to its financial obligations because the agency was waiting for its funding from a line item in 2003 Washington State Budget. If funding was not granted, WSF would have been responsible only for its share of the costs incurred by the project up to that date.

7. PROJECT MANAGEMENT

7.1 Introduction

This chapter discusses two specific issues relating to management of the RFC Project: the contract administration plan, and information flow management.

7.2 RFC Organization and Contract Administration

The organizational approach used in the Central Puget Sound RFC Project is based on a "consensus" model, compared with the approach used in the TransLink® Bay Area fare card project that can be said to be based on an "efficiency" model. Which approach or model to follow is a matter of regional choice, but the unique attributes and consequences of each need to be carefully considered. In the case of the RFC Project, an efficiency model might have resulted in King County Metro having a lead role, perhaps to the extent that it would have defined the technical and institutional makeup of the project and tested the system on its fleet even before any of the other agencies agreed to commit to a partnership. This was not an approach the other partners were willing to follow, and King County Metro did not try to promote this approach given the significant liabilities associated with it.

The RFC Inter-Local Agreement (ILA) includes a Contract Administration Plan that establishes the RFC Project management organizational structure (Figure 4). Overall governance of the RFC Project is vested in a decision-making Joint Board composed of high-level managers from each of the partner agencies. The Joint Board adopted the principle of one vote for each partner, regardless of size, with unanimity required for most decisions. The Joint Board oversees the performance of the Regional Management Team (the Regional Team) that provides guidance to the partner agencies for RFC Project implementation, as well as the oversight and management of the vendor and other consultant contracts.

The Contract Administrator heads the Regional Team and has day-to-day responsibility for managing the other members of the Project Team. The Administrator coordinates project planning in collaboration with the Regional Technical Manager, a Budget and Contract Control Manager, and a Project Assistant and is supported by a technical consultant to the project. The Contract Administration Plan specifies the detailed responsibilities of the Contract Administrator. These include, among many other things, monitoring contractor performance, reviewing deliverables, monitoring project compliance with federal and state laws, and maintaining documentation files relevant to the contracts.

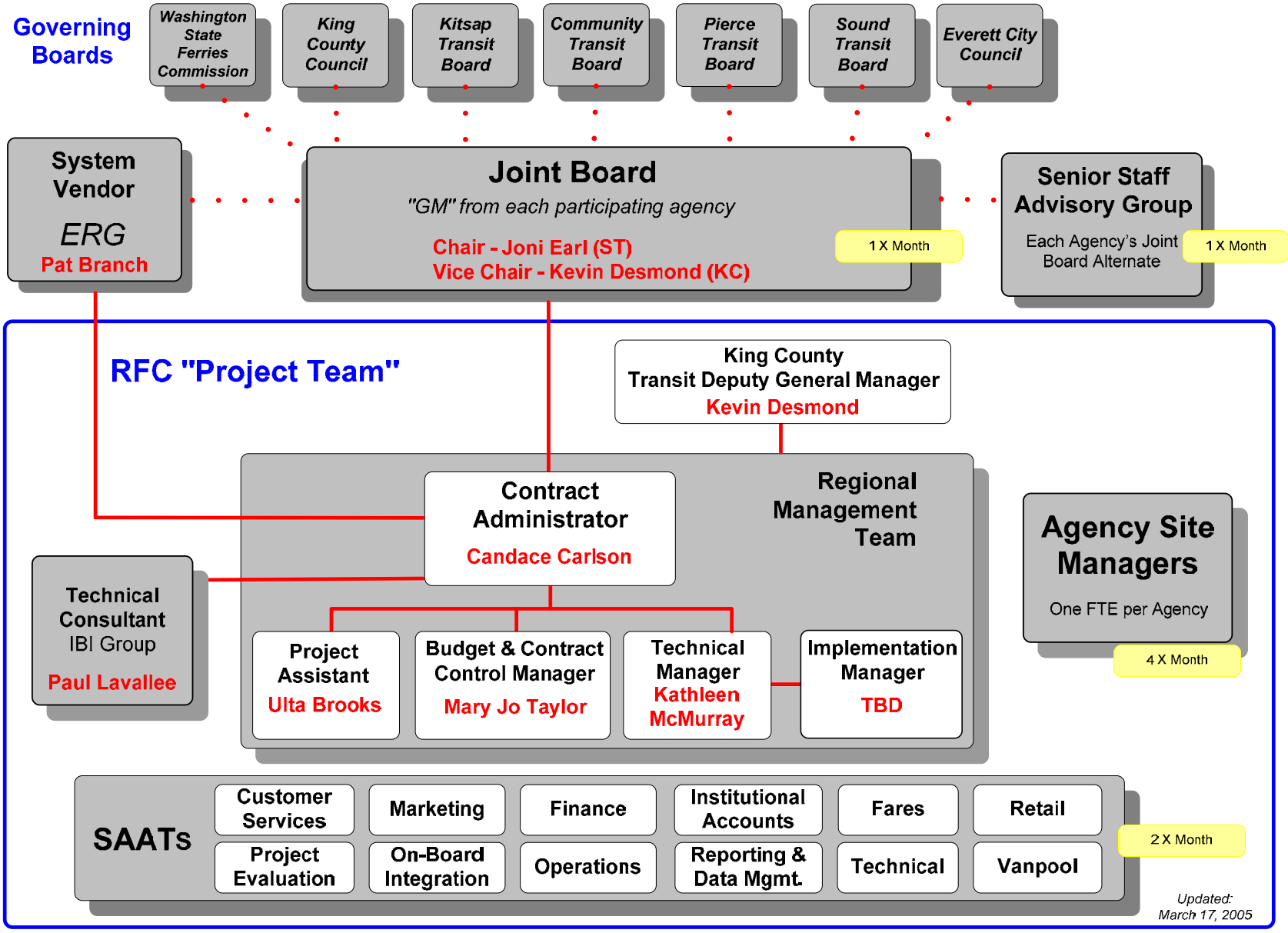

Figure 4. Regional Fare Coordination project organization chart.

7.3 Consensus Approach to Regional Management and Decisions

The "consensus" model offers a variety of benefits and costs. It requires that each agency take an active role in reviewing system design decisions and documents and reaching agreement on vendor directives. This clearly multiplies the amount of work required to develop the project, and makes the work more complicated because of the need to reach consensus among a variety of agencies with differing concerns.

Notwithstanding these time requirements, the "consensus" model worked well throughout the initial stages of the project development process, during which high-level aspects of the system design were agreed between the partner agencies and with the system vendor. However, these stages of the process were characterized by schedule slippage and by a very heavy and unanticipated workload on the partner agency staff. As the project moved towards preparing and reviewing the detailed final design documents, these problems were exacerbated, to a point where the continued viability of the initial organizational arrangement was questioned by some of the partner agencies.

The Interlocal Agreement does not provide for a project manager position, and only mentions project management responsibilities of the Contract Administrator in general terms. In effect, there are seven project managers, represented by each of the partner agencies' Site Managers. The Contract Administrator and Site Managers have concentrated on administering the complex and detailed vendor contract. While the Regional Team includes a Technical Manager responsible for schedule management and agency coordination on all technical matters, there has been a lack of focus on standard project management activities involving project planning, scope, schedule, direction, and guidance of the SAATs. The partner agencies have explored organizational options for strengthening the project management function. Possibilities considered have included increasing the involvement and authority of members of the Joint Board, or hiring a consultant to serve as project manager. The Regional Team has worked much of the time with limited staff, and only recently received Board approval to fill an additional position of Regional Implementation Manager to help with their intense workload. The importance can not be overstated of establishing a regional team that has adequate staffing and resources to support the extensive regional coordination and leadership workload of a project of this magnitude.

Agencies in the Central Puget Sound region are strongly predisposed toward regional collaboration, but of course each RFC Project partner is also dedicated to meeting the needs of its own agency and customers. Given the differences in the characteristics of each agency and its customer base, the consensus model has required considerable time to allow for each partner to express its opinions and needs and work those through a collaborative process toward acceptable compromises and decisions. Nevertheless, the partner agencies believe that the end result will be worth the extra time and effort and, given the strong sense of regionalism in Puget Sound, it is unlikely that a regional participant program across all of these agencies would have been feasible under any other organizational approach.

Locations considering implementing a regional fare card program will want to consider the different organizational approaches that have been tried in other programs of this type and will want to understand and balance the values that each partner brings to the regional entity. Efficiency could potentially be gained by vesting program leadership in one of the partner agencies. However, that would require the other agencies to accept an arrangement with which they and their customers might not be comfortable over the long run. The alternative approach, adopted in this case, seeks to assure that every partner's interests are given equal weight in the final decisions and arrangements. While this process is more time consuming, costly, and demanding of all partners in the near term, it fosters pride and ownership in the resultant regional system over the long run.

Lesson: A Consensus Approach to Management and Decision Making

- Allow each partner an equal say in decision-making in the regional partnership to build trust, understanding and buy-in by ensuring that no one agency will dominate the process.
- Build on past examples of good institutional working relationships and emphasize the values associated with a philosophy of regionalism over individual agency self-interest.
- Be aware of trade-offs associated with the consensus model. A structure in which each agency is equally involved in decisions and policy will almost certainly entail more staff time and cost than a structure with one lead agency.
- Establish a formal agreement, endorsed by the highest levels of management in each agency, that specifies roles, responsibilities and organizational structure in support of the consensus model. The Interlocal Agreement served that purpose for the Central Puget Sound RFC Project.
- Adopt strong project management procedures that allow for clear goals, plans and schedules to help keep the project on track, and provide adequate staffing and resources to a regional team to coordinate and lead a project of this magnitude.
- Seek a balance between attention to management of the vendor contract and to management of the project development process.

7.4 Information Flow Management

A considerable amount of communication between the vendor and the Project Team is required to finalize the RFC system design, and to develop the system hardware and software according to the design. The ILA requires that all communications between the Project Team and the vendor pass through a single point of contact; in practice, the Contract Administrator has delegated this function to the Regional Technical Manager. These communications are formalized in the Request for Information (RFI) process.

RFIs are issued by both parties. Generally, the purpose is to ask for guidance on matters that arise during system development. Upon receiving an RFI, the Regional Technical Manager forwards it to the Project Team members (SAAT members or Site Managers) most able to draft an answer, along with a deadline for a response. The prepared response is reviewed and amended as necessary by the Regional Team and Site Managers before being sent back to the originator of the RFI.

Note that RFIs are not binding, and that decisions reached via the RFI process about system features or design aspects do not become definitive until the final design review.

There has been a large volume of RFIs, and the Project Team found it necessary to develop a system to track the flow of information. Each RFI is given a unique numeric identifier in a database, and its status is updated on the project's restricted access web site and followed to make sure that a response is generated.

In practice, the RFI process has been found to be somewhat cumbersome. While the single point of contact ensures that the Project Team will provide the vendor with consistent messages, it also constitutes a communications bottleneck. Furthermore, several rounds of time-consuming back and forth communication are sometimes required for both parties to be clear on what is actually being asked. The RFI process has been augmented with workshops that provide a venue for RFC Project Team members to interact and work directly with vendor specialists. Both agency and vendor personnel have emphasized the importance of these face-to-face discussions.

7.5 Managing Time and Complexity

The RFC Project is technically, procedurally and organizationally very complex, and this level of complexity places substantial demands in terms of time and effort on the participant agencies and their staffs. One of the RFC Site Managers stated the challenge succinctly: "A regional fare card project will be more difficult and complex than you can imagine."

Impacts of the RFC Project complexity on partner agencies have taken several forms. Most of the RFC Site Managers were hired or assigned relatively soon after the establishment of the RFC Project to lead their agency's participation in the project. Only one of the Site Managers had a full time job in the agency when asked to serve as Site Manager, and this situation created a sense, for a while at least, that the individual had to work two jobs. Part-time agency staff also feel the stress of having to shoulder a lot of additional responsibility.

Several factors contribute to the extensive time commitment required from RFC partner agencies. Because the decision process is based on consensus, considerable emphasis is placed on process. Many of the partner agencies said they would prefer to keep the process simpler, though they do not want to give up the consensus model. Contributing to this degree of complexity are the technical and legal issues that have to be worked out, and the elaborate RFI process.

The vendor produces very detailed design documentation that must be cycled through each agency for careful review and comment. These documents number in the hundreds of pages and their review requires technical, legal, and other types of expertise on the part of the agencies and Regional Team. Processing this kind of documentation, and then seeking resolution to the important issues that are identified through the review process, takes significant amounts of staff time and has resulted in unanticipated extensions to the project schedule.

The Site Managers from each of the seven partner agencies, along with selected members of their agency staffs, must attend frequent meetings of the RFC team in order to stay abreast of the project and effectively manage it on behalf of their agency. Site Managers typically attend several meetings a week in Seattle, which entails significant travel time for those coming from outlying agencies. They also attend many SAAT meetings (some managers attend every one) because they feel this is an important way to exercise managerial control over key decisions and keep up on the flow of information. Time spent away from their agency is time they are unavailable to participate in its regular business, and this has created frustration and problems for agency management as well as the RFC Project Site Managers.

Many agencies consider the project milestone schedule to be excessively tight. The burden of a demanding schedule was exacerbated in some cases by an initial lack of organization. Examples include some SAATs that operated with no work scopes and limited guidance and coordination, and the lack of a clearly identified project management role in the Interlocal agreement. Another consequence of the tight schedule is the perception by participants is that there is too much pressure to make decisions quickly, without sufficient time to review and deliberate.

Elements of the RFC Project's organizational structure duplicate in some respects the internal structures in some of the partner agencies. For example, King County Metro has internal committees that are similar to many of the RFC Project's SAAT committees. The smaller partner agencies on the other hand tend not to have comparable organizational components that could constitute an experience base for the RFC Project. In circumstances where there is overlap, it would be useful to seek ways to achieve synergies and efficiencies.

Some agency managers said that they were concerned that the intense day-to-day pressure of schedule and issue resolution was precluding opportunities to give adequate attention to future-oriented visionary thinking about the project and its implications for both the region and the individual agencies.

From a staffing point of view, the partner agencies say that they have had problems getting the best-qualified staff to work on the RFC Project because staff members are assigned to other work or the needed skills are hard to find in the agency. Also, a significant staff time burden has been experienced by the various subject area experts within the agencies who have had to review designs, attend SAAT meetings and prepare their subject areas for the new system. These subject area experts have continued to reside in their home divisions, such as finance, operations, and maintenance, rather than be assigned to an agency project team, and few if any of them has been backfilled to make up for the extraordinary time they have had to put into the project. The impact of this has been greater on the smaller agencies that have just as much material to review and the same number of meetings to attend but with far fewer agency resources available to them. As a result these smaller agencies have ended up having to be very selective about what elements of the project they are actively involved in. In actual fact the agencies have tended to rely on each other to review aspects of the project for which a particular agency has expertise or a high level of interest. For example, although the employer program will apply to all agencies, KCM has taken the lead in reviewing the design of this program because of its importance to the agency.

This is a very large project and it is bound to encounter unforeseen problems and challenges. One manager mentioned that no project of this size can expect to get everything right at the outset. It is critical to be flexible and willing to change as circumstances evolve. Because of the project's size and complexity, its schedule is entwined with those of other major projects also underway in the partner agencies (e.g., radio systems; smart fare box; GPS/AVL; automatic passenger counters; point-of-sale system for ferries). Schedule slippage in one project can affect the others, through both resource implications as well as technical integration requirements. Organizations undertaking a regional fare card project must fully understand these inter-dependencies from the beginning if they are to avoid costly problems. Finally, fare card systems that require some degree of customization will involve more time and complexity than a purely off-the-shelf system. In the case of the Central Puget Sound RFC Project, the system is being procured from a vendor who is making modifications to existing devices and software to accommodate the regional business and operating rules and the need to integrate this system with existing third party hardware. Agencies considering a RFC Project should carefully consider these time and effort implications when choosing between customized and off-the-shelf systems.

Lesson: Manage Project Time Demands and Project Complexity

- Each partner agency should assign a full time Site Manager, having the requisite project management and substantive skills and experience, and charged with the sole responsibility of managing its program implementation. Assume that it will take one FTE to carry out the fare card project management responsibilities. It is helpful for the Site Manager to have worked for the agency long enough to be able to represent its interests effectively in regional meetings and discussions. Consider reassigning the Site Manager's prior responsibilities to other staff so that he or she can focus exclusively on the regional fare card program.
- Recognize in advance that an iterative, consensus-based process is very time consuming and plan accordingly.
- Anticipate the large amount of time that document review will take for all the parties involved in the project. In scheduling, allow additional time as a safety factor to accommodate those activities and to avoid schedule slippage.
- In planning for participation in a regional fare card program, understand in advance that considerable time will be required to attend meetings, and that this will compete with other agency demands on a Site Manager's time and attention.
- Provide adequate time in the schedule to accomplish all the work that needs to be done, and provide for project management oversight and guidance to gain efficiency and coordination across all the tasks and work groups.
- Take account of the size and experience of each agency to help "level the playing field," and offer extra support where it is needed.
- Look beyond the immediate demands of the project's day-to-day activities and factor into the regional fare card plans the long-term needs of each agency and the region.
- Larger partner agencies are more likely to have depth in staffing and skills and should be able to shoulder a commensurately larger share of the work of the regional partnership. It is important to seek ways to meet the staffing demands from the regional fare card project for the smaller partner agencies in particular.
- Above all, be flexible and willing to make changes during the development of a successful regional fare card project, as it is impossible to anticipate all the issues and challenges that will arise.

8. ISSUES AND CHALLENGES

8.1 Introduction

The previous chapters have described the structure and organization of the RFC Project, the evolutionary history of the development of the project, and the factors that motivate and support a viable partnership. The discussion has noted many of the challenges that have been faced by the partnership in the RFC developmental process. An important objective of this evaluation, as noted in Chapter 2, is to assess how the project partners "identify, address and resolve issues associated with planning for and implementing the RFC Project." This chapter focuses on the more important of these issues: technology risks, finances and fares, operational challenges, and relationships with the vendor and the agencies' customers.

8.2 Technology

8.2.1. System Specification and Procurement Approach

In very broad terms, agencies wishing to procure and implement a fare card system can proceed in one of two contrasting ways:

- Procure a particular vendor's "off the shelf" system; tailor it to agency characteristics; and adapt their business and other functions to make use of the system; or
- Specify the desired system capabilities based on agency business processes, operations and needs; select a vendor to develop a system that provides the desired capabilities; and integrate it with agency functions.

The RFC Project adopted the former approach and selected hardware and software from a vendor who, in close consultation with the RFC Project partners, is modifying portions of existing hardware and software to accommodate the RFC Project's business and operating rules. The partner agencies felt that fare collection and processing were core transit agency functions.[39] In consideration of the potentially large impact that a fare card system could have on these functions, they preferred to conceptualize the agency business processes and fare card system as a comprehensive whole. They felt that this approach would ensure that agency business processes would be most able to take advantage of the fare card system technology, and that the fare card technology would best support the agency business functions.

Accordingly, the partner agencies proceeded by (1) creating a vision of how a fare card system could be integrated with and support their functions and operations; (2) developing detailed system requirements, based on an analysis of how fare card technologies could best be applied to improve the performance of the agencies' core business functions; and (3) deriving

[39] In King County Metro, for example, fare issues directly affect twenty agency divisions.

corresponding technology specifications. The detailed technology specifications that resulted from this analysis were later included in the Request for Proposals (RFP).

The development of a system vision, functional requirements and preliminary specifications were significant milestones in the overall phasing of the RFC Project. This research, analysis and consensus-building effort took the partner agencies roughly one year to complete, working closely with a technology consultant. Some of the smaller partner agencies initially found the technology issues daunting, but over time they learned from the larger and more technologically sophisticated partners.

In parallel with the requirements analysis and prior to issuing the RFP, the agencies also investigated the potential vendors and the types of systems that each offered. In view of the long-term relationship that would be created by the choice of a vendor, the partner agencies felt that they should become as familiar as possible with the candidates, their technologies and their systems.

Conducting the procurements for this project has presented a challenge as well, since the Regional Team lacks the authority to make procurements on behalf of the partner agencies. On the other hand, individual agency procurement policies vary from one agency to another, and agency policies may be unable to accommodate the regional budget for acquiring the needed goods and services. This is essentially an unresolved issue. Recent procurement needs have been handled by "tagging on" to existing agency contracts. Nevertheless, the difficulty agencies have faced in handling the services and materials procurement requirements of the RFC Project remain a very significant institutional issue.

8.2.2. Hardware / Software Standards

There are currently few adopted standards concerning the hardware and software interfaces between different components of a fare card system. While fare card standards are in development, through the American Public Transportation Association's (APTA) Universal Transit Farecard Standards (UTFS) Program, no UTFS standards were sufficiently complete in time for this project. During the Puget Pass program, this lack of common standards meant that the incompatible technologies used by the various partner agencies created a barrier to communications between agencies. In developing the procurement for the RFC system, the partner agencies wanted to avoid creating a similar situation.

In the RFC Project, the vendor-provided on-board equipment includes:

- the driver display unit (DDU), which is the device that bus operators use to communicate with the system; and
- the fare transaction processors (fare card readers), which access information on a passenger's fare card and make it accessible to the rest of the RFC system.

Partner agency vehicles include a variety of other devices, such as radio systems and vehicle destination displays.[40] Operators currently have to initialize these different systems individually, which wastes time and is a potential source of errors. The RFC Project RFP required that, following an operator's logon to the DDU, the DDU should be able to initialize other on-board systems itself, without requiring further operator intervention. This obviously means that the other systems must be able to interface with the DDU. The agencies also required the vendor to integrate their systems with the agencies' existing or planned on-board technologies. This requirement was the driving force behind the biggest change the vendor had to make to their off-the-shelf technology.

In the absence of industry-wide interface standards, the project partners decided to impose the requirement that the hardware and software products of different vendors be able to inter-operate. This requirement also ensured that the RFC system would be able to evolve over time, for example if new agencies or new modes became part of the system. This is different than requiring the different vendors to comply with a single set of open standards. The partner agencies also attempted to introduce standards when possible, but opportunities for this were limited because of the legacy hardware and software in use by the various agencies.

According to the RFC Project vendor contract, the system vendor bears responsibility for ensuring that all other on-board systems interface properly with the DDU.

The RFC Project "back office" and transaction clearinghouse software was held almost to the software standards of a financial fiduciary institution. Again, there is no industry-wide data standard for registering transit fare transactions. The vendor software was required to interface with several existing systems other than those on-board the bus, such as the Washington State Ferry system gates and their back office system, and Sound Transit's ticket vending machines. An additional important requirement was that the software should allow each individual partner agency to keep its independent fare structures and policies.

8.2.3. Software Specification Via Output Reports

The system software requirements were specified, in part, by defining in detail the reports that the RFC system would be expected to produce in order to provide data needed to support the partner agencies' business processes. By working "backwards" from these report requirements, the system's data collection and storage needs could be deduced, and the system database functional requirements could be derived. Moreover, with this approach the software's report generation functions were explicitly specified from the beginning, rather than added on as a cost-inflating afterthought, as sometimes happens in system procurements.

[40] There are also plans to equip vehicles with GPS units.

8.2.4. Technology Risk Management

The procurement, initial deployment and ongoing operation of the RFC Project presented the partner agencies with new hardware and software technology and the need to address risks associated with them.

The RFC Project partner agencies decided to procure an "off-the-shelf" fare card system, selectively modified to accommodate technology specifications from their core business needs. The agencies felt strongly that their business needs should determine the system's features and capabilities. They preferred to accept the risks associated with some system modifications rather than trying to adapt their business processes to an already developed but possibly mismatched system.

The RFC Project's Request for Proposals (RFP) required responders to post a $10 million performance guarantee and meet a restricted and demanding milestone payment schedule. This was done to ensure that only well-established, financially robust firms would reply. The partner agencies recognized that their procurement approach might exclude less-established vendors even if they were viable and had interesting, innovative technology, but the partner agencies accepted this in order to reduce the risk of selecting a financially unstable vendor. It turned out that the restricted milestone payment schedule was more troublesome for proposers than the performance security.

Three firms responded to the RFP. One was initially deemed non-responsive. The partner agencies conducted an extensive process of proposal review and revision and two Best and Final Offers (BAFOs). An Apparent Successful Proposer was identified and the agencies concluded negotiations with this vendor. The selected vendor had already developed and deployed (in other locations) most of the hardware and some of the software components that would be used in the Central Puget Sound RFC system. Because of this prior experience, the RFC Project partner agencies avoided much of the risk associated with unproven technologies, and benefited from the earlier system development efforts.[41]

Much of the new software was developed for the RFC system to implement the agencies' business rules, and to interface with their network and other onboard systems. Most or all of this software would have had to be developed in some form even if an unmodified off-the-shelf system had been chosen; the associated development risks can thus be considered unavoidable.

The already-proven reliability of the technology was reflected in the design of the plans for the RFC system beta test. Beta tests are normally intended to discover and correct a wide variety of system errors and defects, and can involve considerable and extended efforts to modify problematic technology. In the case of the RFC Project, however, the beta test is not intended as a test of the technology, and it is not expected to lead to substantial debugging efforts. Rather, it is intended to verify the overall functionality of the RFC system (technology, operating procedures, business processes) as a whole. The test will involve equipping approximately 400 buses (a subset of each partner agency's regular revenue service) with modified DDUs and card

[41] It was estimated that the cost of the procurement might have increased by $100 million if the RFC Project's technology had been developed by the project itself.

transaction hardware. The software that carries out the back office operations and interfaces with the partner agencies' legacy systems will be fully implemented. Some customer service terminals will be deployed. The beta test will run for a relatively short time: a two-week break-in period, approximately six weeks for the basic system testing and up to three months total for additional data collection. During or following the beta test, bus operator focus groups will be held to discuss potential DDU user interface issues, and these may lead to minor software revisions. These are the only technology fixes that are anticipated to be required during the beta test. Currently, the beta test is expected to occur in the third quarter of 2006.

The greatest technology risk and concern has been that the vendor might default on the contract, leaving the partners with a "black box" software system that they would be unable to continue to develop. The vendor, on the other hand, considered its system source code to be proprietary.

This risk was managed via a software escrow agreement. The vendor contract required the vendor to deposit the system source code and associated documentation with a software escrow company, and to update and refresh these files at each milestone payment until Full System Acceptance. During the operating phase, the escrow must be updated with each system upgrade. Under the terms of the contract with the escrow company, the agencies could periodically ask the company to verify that the source code compiles correctly, and that its functionality matches that of the currently deployed system. The contract also stipulates that, if the vendor defaults, the escrowed code would be released to the partner agencies. They also have the option to purchase the software outright at the term of the ten-year operating contract.

This escrow arrangement is somewhat complex (as it involves a three-party agreement) and can be costly, contingent upon the frequency of full build and verification services. However, it was felt to be the most satisfactory way for both the partner agencies and the vendor to manage the risks associated with the RFC system software. Some lessons regarding the risks associated with a fare card technology include the following:

8.3 Financial Issues

From the revenue allocation procedures to treatment of funds flowing through the fiscal agent, in designing the RFC Project, partner agencies have dealt with numerous issues of central importance to their financial operations. In doing so, each of the agencies recognized that in order to take advantage of the RFC system technology, each must adopt new business rules to deal with pressing issues related to, among other things, revenue allocation, operation of the fiscal agent, interactions with the revenue clearinghouse and potential partnerships with third party retailers. Resolution of these issues affects each agency's bottom line at a time when public transit agencies are experiencing constrained resources. To the extent the resolution of an issue holds negative consequences for an agency, their fares are placed in jeopardy.

Lesson: Anticipate and Manage RFC Technology Risks

- Recognize that the risks of developing a customized fare card technology (hardware and software) are potentially much greater than the risks associated with accepting an off-the-shelf technology that is already proven.
- A modified off-the-shelf or customized system has the advantage of closely meeting the specified needs of the regional partnership, along with the disadvantage of needing more development and testing to be certain that it does what it is supposed to do.
- Establish a sufficiently large performance security requirement with the system RFP to assure that only financially secure firms are likely to respond. The down side is the likelihood that some firms with new technologies may be excluded from further consideration, and competition may be limited as it was in the Central Puget Sound case.
- All else equal, it is preferable to select a vendor with established electronic fare card systems deployed elsewhere that also meet most of the requirements of the project. This helps avoid the risks of adopting unproven technologies.
- Customized software may need to be developed in order to accommodate the partners' existing legacy systems with which it must be integrated. These risks usually cannot be avoided, though in the case of Central Puget Sound not all the partner agencies had legacy integration issues.
- Establish an escrow account for source code, documentation and other trade secrets to protect against the risk of vendor default, and contractually require the vendor to deposit its proprietary source code, build documentation, and periodically update them.
- Require a conservative payment schedule that allows for major milestone payments at limited points in the contract, each associated with a significant and satisfactory completion of work.
- Require extensive and comprehensive insurance coverage from the vendor.

Figure 5 shows the RFC centralized operating concept overview, which illustrates how funds will flow into the system through the revenue clearinghouse and fiscal agent and, ultimately, into transit agency accounts. The RFC system will offer several outlets for customers wishing to purchase regional fare cards. Fare cards will be issued and revalued through the project website, at agency customer service offices, by phone, and by mail. The region's extensive network of employers, schools and other institutions that subsidize passes will also handle the distribution of a significant number of cards. Customers may also add value to their card at selected retail outlets, at Sound Transit (ST) ticket vending machines, or may automatically revalue periodically based on a predetermined schedule or when the card balance drops below a specified level. Lost, stolen, or damaged cards can be easily replaced without losing value, provided that the customer registers their card with the program. For example, when replacing a lost card, the lost card is invalidated and the balance of the original card is transferred to the replacement card.

The RFC system will use contactless microprocessor electronic smart cards to automatically calculate fares due and initiate passenger payments. The partner agencies expect that following full deployment, the regional fare card and physical cash will serve as the primary forms of fare media within the region. RFC Partners estimate that they will issue 400,000 smart cards upon the commencement of revenue operations.

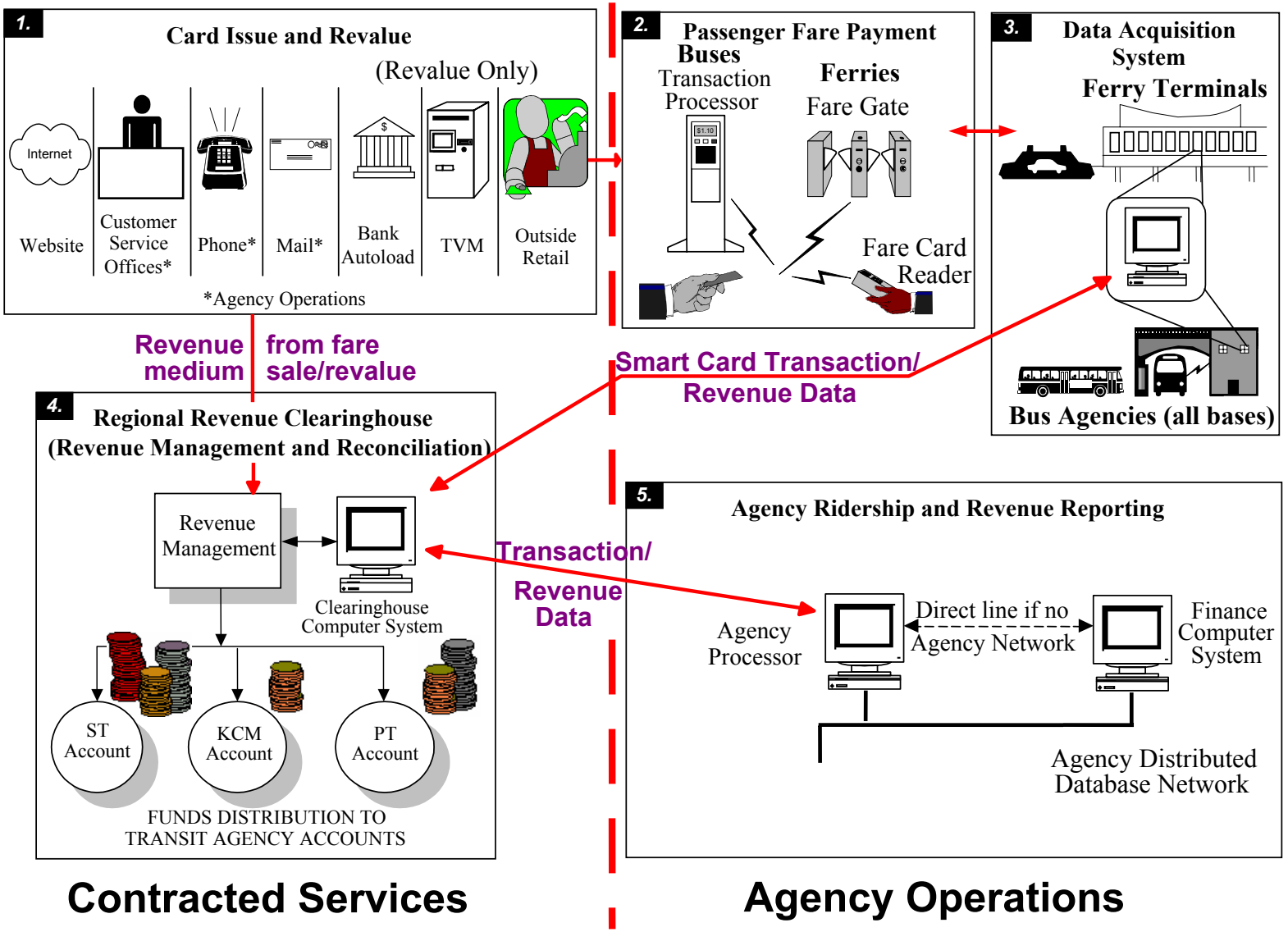

Figure 5. RFC Centralized Operating Concept Overview

Figure 5 shows that as partner transit agencies collect fares (e-purse reloads, pass sales, etc.) and the vendor tracks the services provided by the various agencies, each day a settlement will occur and the net of the value of the services minus revenue collected will be attributed to each partner agency. Thus, the RFC system is designed to allow transaction data to be uploaded nightly when vehicles are re-fueling or traveling on transit agency property. At these points of contact, data will be transmitted wirelessly between the on-board fare transaction processors (OBFTP) and the data acquisition system. In turn, the data will be pulled into the revenue clearinghouse. That night, a report will be produced showing a net settlement. Before the conclusion of the next day, an automated clearinghouse (ACH) report will be filed and funds transferred. Thus, the process is extremely timely and settlements occur daily with funds transferred within 48 hours of revenue generation. While this daily reconciliation process applies for the e-purse system, revenue from the sale of passes will be reconciled monthly.

This section of the report examines some of the more relevant financial issues dealt with by the partner agencies, and includes issues overviews, resolutions reached, problems faced when determining the best approach for dealing with an issue and other relevant matters. The section explores the issues in relation to three of the stages outlined in the centralized operating concept overview: card issue and revalue, passenger fare payment and the revenue clearinghouse and revenue allocation. As was the case in the development of business rules related to fares, the dynamics of multiple partner agencies and the ethos of consensus were central in the financial business rules established by the partner agencies.

8.3.1. Card Issue and Revalue

The technological capabilities of the RFC system create marketing and potentially revenue generating opportunities for the regional partners. The partner agencies recognized early on in the development process that the smart card could be designed in a manner to enable third party retailers to maintain a position on the smart card because they allow up to four applications. The partner agencies envisioned a future system whereby retailers or the partners could sell the card to their customers who would in turn use it to both purchase goods and services from the retailer and pay fares on the regional transit system. However, the Joint Board directed early on that the primary mission was to develop the transit application and design a system that best served the agencies' business requirements. All non-transit applications would only be considered following Full System Acceptance.

A system such as the one described above was theoretically desirable in that it could be used as a marketing tool or a revenue generator if, for example, the partner agencies charged a licensing fee for the transit application. The cards could also be used in order to access buildings at major area employers and academic institutions, such as Microsoft, Boeing or the University of Washington.

Due to concerns with banking regulations that relate to the management of public funds maintained in banks in the State of Washington, an issue arises with regard to a public transit agency or another private entity that would manage the e-purse. There is also some concern expressed by the Finance SAAT that multiple entries on a card may take several additional seconds to process, producing a wait time that could cause problems for users. If, for example,

the transit application were moved into the fourth position, it would potentially slow down the boarding process as the OBFTPs work sequentially through the applications to identify the e-purse account. Thus potential participants, including the transit agencies, would want to be in the first position (of four possible on the electronic card chip) so that their application is handled rapidly. However, the concept of a separate open e-purse managed by another entity (e.g. a card association), or the transit application residing on another entity's card is still an option for future consideration.

Assuming the technical issues could be resolved, there is still the matter of complying with public funds depository rules within the State of Washington. At this time, the partners have expressed an unwillingness to act in the same manner as a private bank. The questions that are of central importance to this issue include:

- How would the partner agencies handle the commingling of public and private funds?
- Would these funds flow through the revenue clearinghouse?
- Would State auditors allow this sort of arrangement?
- How would the agencies maintain financial controls?
- Do State banking laws preclude this sort of activity?

The partners chose to move toward the closed electronic purse path. However, the system has been designed to reconsider the option at a later point in time after these issues have been resolved. The flexibility is there in the smart card and the private partner alternative remains an option that has yet to be fully explored.

Escheatment laws were also problematic from the standpoint of the partner agencies. The State of Washington requires that after two years, any unclaimed property revert to the State with the property available to be claimed later by the citizen provided the person is informed of the unclaimed property and can validate his or her claim to it. As it relates to the RFC Project, the e-purse was an issue. Would the partners be required to pass along unused portions of e-purse accounts following two years of inactivity? Such a requirement would introduce additional complexity in the revenue clearinghouse and would require that these funds revert to the State's general fund, along with relevant information that could be used to locate the customer. The partners noted that under current law, the Washington State Lottery receives an exemption from the escheatment laws related to unclaimed awards. In turn, the region's transit agencies have considered seeking a legislative remedy to this issue.

8.3.2. Passenger Fare Payment

Under the RFC system, passengers are presented with numerous alternatives for purchasing and revaluing cards. Payments can be made over the Internet, at customer service offices, by phone, by mail, at retail outlets, at ticket vending machines and can be done automatically through bank autoloads. Under the autoload option, cards would be revalued to pre-determined amounts (i.e., $100) once the e-purse balance drops below a specified value (i.e., $5). Payment may take the form of cash, debit or credit card or check. Also, autoloads of pass products can be triggered by date (e.g., the 25th of the month autoload of the next month's pass).

What happens if the partner agency receives a Not Sufficient Funds (NSF) check? In the past when a transit agency issued a pass and received an NSF check, the agency absorbed the loss or attempted to notify the customer and recover the payment, though the amount of the NSF check rarely warranted an aggressive collection approach. Under the RFC system, NSF information will be stored in the revenue clearinghouse. From this, a bad check list will be created, thus restricting the ability of the passenger to write future checks. The agencies considered blocking the use of the smart card purchased with the NSF check; however, this is problematic because the passenger could have an existing balance previously obtained with cash or through another valid payment method. To block the card would be to deny the person the opportunity to access a valid e-purse balance. In order to reduce the risk associated with NSF checks, the partner agencies have established business rules to limit e-purse values, build in the ability to block the card, limit period passes to 30 days and identify passengers with a history of writing NSF checks.

An additional complexity associated with the technology that has presented customer service problems to the agencies relates to the interaction between the "back-office" system that handles all transaction data, reporting and revenue reconciliation and the OBFTPs. When passengers revalue their card at a retail outlet, ticket vending machine or customer service office, the data are immediately stored on the smart card. However, because the data acquisition systems must communicate with the OBFTPs in order to share transaction data, remote revaluation of the smart card through phone and Internet transactions result in a one-day delay between payment and service availability. That is, a phone payment must be communicated to the OBFTPs when they transmit data to the data acquisition system, and must then be communicated to the smart card before the enhanced balance may be accessed. This requires self-monitoring on the part of the passenger, which is difficult and could lead to customer satisfaction issues. This issue has not been resolved due to technological limitations.

8.3.3. Regional Revenue Clearinghouse and Revenue Allocation

In the State of Washington, public funds must be held in government-controlled bank accounts within banks located in Washington. Thus, all RFC Project revenue allocation procedures were designed with State rules related to the handling of public funds in mind, which means that the revenue clearinghouse, which represents a vendor-operated technology, serves as a conduit through which settlements are cleared. At all times, revenue generated by the system must be deposited in bank accounts managed by a government agency. In this case, the partners rely on Sound Transit (ST) as the Fiscal Agent. As the fiscal agent, ST is responsible for managing regional bank accounts for the RFC system. Each agency establishes its own bank accounts and authorizes the fund movement in and out of those specific accounts.

Acting as the Fiscal Agent generates both financial opportunities and risks to ST. In response, the partner agencies have designed certain business rules to minimize the financial gains (e.g., interest on revenue from unused passes) and mitigate ST risk exposure. For example, the system is designed in a manner that ensures that the fiscal agent must always be made whole. If the fiscal agent were not made whole each day, there would be great financial risk to both the fiscal agent and the partner agencies. That is, there could potentially be an un-booked liability not shown on an agency's balance sheet. In the event that the liability was discovered later, an

agency could be asked to recover a substantial sum for which no budgeting would have been made.

How could the fiscal agent experience a shortfall? Retailers, for example, sell passes every day but some transmit the revenue from these sales on a weekly basis. In the event that agents sell the passes on Monday but funds are not collected until Friday, the agencies may be due funds as the pass is used throughout the week but the fiscal agent would not have received any revenue from the third party agent. To address this sort of financial liability to ST, the partner agencies are collectively funding a $200,000 float account in order to keep the fiscal agent whole.

With respect to financial gains, partner agencies expressed concern that they would lose revenue associated with the float, or interest earned when funds rest in a revenue account, and that these revenues would accrue to ST, acting in its role as the fiscal agent. How could the interest accrue to the fiscal agent? If a passenger replenishes his or her e-purse electronically, funds will flow from the passenger's bank account into an account managed by the fiscal agent. As the e-purse is drawn upon, agencies supplying services will receive fares from the fiscal agent. The unused portion of the e-purse balance will be resting in a revenue-generating account controlled by ST. In order to minimize float and expedite the transmission of revenue, the partner agencies designed the net settlement approach with its swift 48-hour funding period. Further, the partner agencies have agreed on a quarterly distribution of interest revenue based on the operating and maintenance shares for each partner agency shown in Table 7 in Section 8.5.1.

While the Joint Board has required the partner agencies to limit the scope of their activities in the RFC Project to focus on the implementation of a viable smart card for public transportation applications, there is future promise for this technology to support other financial applications of value to the agencies and their customers.

Lesson: Take Advantage of the Technology to Enhance Revenue and Improve Management of Financial Operations

- Consider allowing third party retailers to maintain a position on the smart card and use the card for both public transit and retail purchases. Weigh the marketing benefits against the financial requirements and technological barriers associated with third party integration.
- Where feasible, integrate the card with existing on-site security systems of large institutional customers. The smart card technology could be used to access buildings at major area employers.
- Present passengers with numerous alternatives for purchasing and revaluing cards – e.g., phone, mail, retail outlets, ticket vending machines. Minimize the time between when the payment is made and when the card is revalued and can be used on-board transit vehicles.
- Use the smart card technology to limit the impact of NSF checks.
- Consider using the smart card technology to generate data for financial reports, improve passenger count estimates and better understand the market in each jurisdiction.

8.4 Fares

The cooperative establishment of a set of regional fare policies has proven to be a daunting task for the agencies participating in the regional fare coordination project. The automation of regional fare transactions is complicated by differences in agency policies relating to discount rates on monthly passes and proposed e-purse applications, transfer policies and revenue reconciliation, fare integration principles, fare standardization, treatment of institutional accounts and discounts for elderly and youth passengers. Agency agendas are shaped by historic practices, customer demographics and other elements that drive fare policies. While each agency recognizes the importance of a comprehensive and simple regional fare policy from a customer service perspective, each is reluctant to abandon local autonomy when it comes to setting fare policy. Furthermore, each agency is keenly aware of the financial implications of changes to existing fare structures. With this in mind, the agencies formed a Fare SAAT to deal with the many complex fare-related issues facing them. This section of the report examines some the more significant issues dealt with by the Fare SAAT.

8.4.1. Integrated versus Coordinated Fare Structure

The primary challenge to designing a multiagency fare system or framework that meets the needs of all seven participating agencies has been the strong desire among the partners to maintain autonomy with respect to local fare policy. In broad terms, multiagency fare management programs generally take one of two forms:

- Integrated fare structures that operate on a single standard when calculating fares, as applied consistently across all participating agencies.[42] Under this structure, travelers pay fares according to a consistently applied system of zones, discounts and rate policies applied ubiquitously within the region served by the regional fare management program. Examples of integrated systems can be found in Phoenix, Arizona (Valley Metro) and Hong Kong (Octopus).
- Coordinated fare structures enable passengers to use a single fare medium but allow partner agencies to retain autonomy in setting fare policies. Thus, passengers enjoy the convenience of using a single fare card but may encounter complex fare structures with features (e.g., discount rates on fare card transactions, transfer credits) that vary from one agency to the next. Examples of coordinated fare structures can be found in Ventura County, California (Passport) and the San Francisco Bay Area of California (TransLink®).

The RFC Project partner agencies have adopted a framework for coordination of existing agency fare structures. The preference for the coordinated framework is due in part to the wide variance among the partner agencies when it comes to fare policy objectives. These policy differences are related to differences in the customer base served by each agency and their overall mission. In addition to using the single fare medium (the smart card), the partner agencies are sharing

[42] Lobron, Richard. Developing a Recommended Standard for Automated Fare Collection for Transit: Scoping Study-Regional Fare Management Programs. TCRP Project J-6/Task 42. February 2003. Washington, D.C.

revenue from transfer discounts, and they are allocating revenue from pass products that are valid on six of the seven agencies' systems (all but WSF).

A coordinated framework allows for more local control of certain fare policies, which is desirable to the agencies participating in the RFC Project. Local autonomy, however, results in technological and fare structure complications that can drive up programming costs and negatively affect customer service. The lack of uniform fare policies could potentially result in complications that weaken customer acceptance of the technology. For example, inconsistent discount rates would result in customers being charged different fares for inbound and outbound trips. Furthermore, the amount of revenue allocated to each agency would also differ. To illustrate this point, consider the following example.

> Example: A rider takes a morning trip on a KCM bus with a $1.50 fare and transfers to an ST bus with a $2 fare and then returns later that night taking the same buses in the reverse order. These calculations examine the morning trip.[43]

1. Assume the discount for KCM is 10% and the ST discount is 15%.
2. Assume that fares are allocated based on a purse contribution value (fare – discounts applied).
3. The total fares paid from the purse would be $1.35 ($1.50 – 10% discount) + $0.55 ($2 - $1.35 credit from first fare – 15% discount on remaining fare) = $1.90.
4. Total purse contribution value (total fare – discounts applied) = $1.35 (KCM) + $1.90 (ST) = $3.25.
5. KCM share of revenues = $1.35 / $3.25 * $1.90 = $0.79.
6. ST share of revenues = $1.90 / $3.25 = $1.11.

If both KCM and ST offered an identical 10 percent discount, the KCM share would increase to $0.80 while the ST share would be $1.15. Thus, in this instance, KCM would be partially subsidizing the higher ST discount rate.

On the return trip, the total fares from the purse would be equal to $1.70 because the rider would receive credit for the larger 15 percent discount on the first leg of the journey, the ST share of purse revenue would be $0.90 and the KCM share would be $.80. In the absence of the discount rate differential, the ST share of purse revenue would be $0.92 and the KCM share would be $0.82. Once again, KCM would be subsidizing the higher ST discount rate.

8.4.2. Transfers and Revenue Reconciliation

The Fare SAAT has dealt with numerous issues relating to the treatment of interjurisdictional transfers. In addition to decisions concerning how to attribute revenue between agencies, there are issues relating to the transfer period, discount values, the basis of revenue reconciliation, treatment of cash and potential transfer surcharges. Each of these issues made it difficult to establish a regional fare policy. However, the representatives of the seven partner agencies

[43] Edmonds, Lex of ERG Group. Central Puget Sound Regional Coordination System: Finance/Fares SAAT – Discount Fare Incentive Overview. May 26, 2004. Seattle, WA.

serving on the Fare SAAT have worked cooperatively to establish a set of recommended general policies dealing with these issues, including those outlined below:

- With respect to transfer periods, there should be a regional one (current recommendation of 2 hours) but the system should be designed to allow the transfer period to be changed at a later date.
- The partners are considering a $0.25 transfer surcharge and the system should be designed in a manner to accommodate such a charge.
- Cash paid during multiagency trips will be retained by the collecting agency, and not included in the revenue reconciliation process. The decision to recognize cash boardings when issuing intersystem transfers will be at the discretion of the local transit agency.
- Revenue reconciliation will be based on the proportion of the value of services provided, as based on the cash value of the trips taken.

The last point is significant. Under the Puget Pass system, revenue was shared among agencies based on the estimated total number of boardings and the average fares per boarding as determined through survey data. Under the RFC system, the value of each trip allocated to each agency will be determined on a cash fare basis, which is based on the full fare of each leg of a trip, and on actual trips as recorded by the fare transaction processors. To illustrate this adjustment in policy, consider the following example.

Example 1: Puget Pass[44]

A rider uses Puget Pass to pay a $1.50 fare on a KCM bus. She then transfers to a CT bus with a $3 fare and finally transfers to a bus on a local CT route with a $1 fare. The fare would be divided under the Puget Pass system as follows:

1. The KCM average fare per boarding is $0.7747 and the CT average fare per boarding is $1.39.
2. KCM receives $0.7747 for their leg of the trip.
3. CT receives $1.3957 * 2 (2 boardings) = $2.7914
4. The rider pays $1.50 on KCM and $2 on CT for a total of $3.50.
5. Sound Transit fare integration fund provides $0.06661.

Example 2: RFC System[45]

Under the RFC Project, the money would be divided based on the cash value of each trip as follows:

1. The rider receives a 10% percent discount for using the smart card.
2. The cash value of the services provided by KCM is $1.35 ($1.50 - $0.15 discount).

[44] Sound Transit. Proposal for Transfer Trip Revenue Sharing Policies. December, 2003. Seattle, WA.
[45] IBID.

3. The cash value of the services provided by CT is $2.70 ($3 - $0.30 discount) because the second leg is considered a free intrasystem transfer.
4. The total cash equivalent value of the services provided by KCM and CT is $4.05.
5. The KCM share is $1.35 / $4.05 = 33% * $2.70 (fare paid) = $0.90.
6. The CT share is $2.70 / $4.05 = 67% * $2.70 (fare paid) = $1.80.
7. There are no payments from the fare integration fund.

In keeping with the coordinated framework approach, the partner agencies agree that the RFC system should be flexible enough to accommodate changes in fare policy after implementation and in policies that vary between agencies.

8.4.3. E-Purse Incentive Programs

A recent TCRP publication that considers the development of a recommended standard for automated fare collection notes that "A program's inability to offer patrons financial incentive to use multiagency instruments can cause such undertakings to fail because of a lack of customer interest."[46] Thus, the partner agencies have considered several incentives designed to induce participation in the RFC Project. The motivations for offering discounts differ significantly between the partner agencies. For example, CT argues for less discounting due to their limited capacity and their focus on recovering revenue. On the other hand, fare integration was identified as a long-term goal in Sound Move, Sound Transit's long-range plan. Also, ST is motivated because, under the Puget Pass system, it subsidizes participation on the part of local transit agencies through the fare integration fund.

The partner agencies have considered several potential incentive programs:

- Loading money bonus where a customer would receive additional credit when loading a card (e.g., they pay $20 and receive a $21 credit).
- Loading product bonus where the customer would receive a product when they load a card (e.g., they load $100 and receive a free day pass on Sounder Rail).
- E-purse trip discounts where a customer pays a discounted fare (e.g., $1.50 fare reduced to $1.35 due to 10% discount).
- Free rides bonus where a customer gets a free ride when they have purchased a pre-determined number of trips (e.g., buy 10 trips get the 11th free).
- E-purse caps where a customer is not charged to ride after a pre-determined ceiling is reached (e.g., customer can be charged a maximum of $5 per day by partner agencies).
- Special promotions where a customer would receive special discounts at a specific time or at a specific location, as determined by each partner agency.

The majority of these incentive programs have been rejected due to revenue reconciliation issues, issues related to refunds, technological barriers and transaction time issues. Since many of these reasons for concept rejection are tied to revenue reconciliation and technology barriers, to a

[46] Lobron, 2003.

certain extent the design of the RFC system can drive fare policy. Thus, system design and the ability to offer incentives are interlinked. The e-purse discount was selected as the preferred option by both the Finance and Fare SAATs.

8.4.4. Regional Fare Categories

The regional fare policy requires standard passenger definitions in order to assign discounts and other subsidies to certain passenger groups. Historically, the rider categories have been inconsistent between agencies. However, the Fare SAAT has recommended the following fare categories:

1. Children under 6 ride free
2. Youths are ages 6-18
3. Adults are ages 19-64
4. Seniors are ages 65 and over

Once again, partner agencies have expressed the desire to retain autonomy with respect to defining these categories on local routes. For example, ET defines a senior citizen as 62 years of age and beyond, and KT is interested in maintaining the ability to offer discounts to low-income riders.

8.4.5. Fare Integration

To the extent that the smart card system applies overly complicated fare schedules that are not easily understandable from the standpoint of the consumer, this may create an untenable position where consumers are reluctant to convert to the new system, argue with drivers concerning fare policies and experience less satisfaction with the local services. Therefore, many of the partner agencies view the RFC Project as an opportunity to simplify fare structures. One partner agency (CT) expressed a strong interest in simplifying the fare structure and argued that the KCM fare schedule was too complicated, making it difficult for the other agencies to design a comprehensive, understandable fare structure. While some agencies have been more reluctant to refine fare schedules and instead favor the replication of the current fare network, the partner agencies recognize the importance of reaching consensus on the simplification and integration of their fare structures.

Lesson: Assess the Tradeoffs between Local Autonomy, Customer Service and Other Financial Considerations When Designing a Fare Structure

- The desire for a particular fare structure is driven by the partner agencies' characteristics, operating context and fare policy objectives.
- Allow each partner a voice in determining the fare policy adopted for the region.
- Establish a coordinated framework to effectively accommodate differences in fare structures and discount policies across participating agencies.
- Local autonomy, which is highly valued by the partner agencies, can result in technological and fare structure complications that drive up programming costs and negatively affect customer service.
- Minimize technological and fare structure complications to the extent possible because these factors can have a significant impact on customer service and technology acceptance.
- Monetize the impacts of various fare policies on the partner agencies in order to support increased equity.

8.5 Project Finance

The development of a viable project finance plan in a multi-jurisdictional setting has proven difficult and has required substantial flexibility on the part of the partner agencies. Innovation through partner subsidies, private donations, grant sharing and cost-sharing has resulted in a finance plan that includes a variety of funding sources. Even as the partners have worked together to develop a finance plan agreed to by all parties, unforeseen external factors, such as the voter-approved Motor Vehicle Excise Tax (MVET) repeal, have presented challenges that have nearly derailed the RFC program. Through voter-approved sales tax increases meant to replace the funding lost to the MVET repeal and other remedial measures, these challenges have been addressed, and the RFC finance plan has slowly taken shape. This section first presents an overview of the RFC Project costs (capital, operations and maintenance) and sources of funds supporting the RFC Project and then examines the evolution of the project finance plan as the partner agencies have worked cooperatively to overcome the significant financial challenges to project implementation.

8.5.1. Project Budget and Revenues

The total capital costs of the RFC Project are estimated at $42.1 million (nominal),[47] paid out during the 2003-2006 timeframe, as shown in Table 4. This estimate includes all vendor contract cost components, including equipment, equipment installation, fare cards, integration and project management as well as other RFC Project administration costs, including sales tax, contingency

[47] King County Metro, Community Transit, Kitsap Transit, Sound Transit, Washington State Ferries, Pierce Transit and Everett Transit. 2003. Interlocal Cooperation Agreement for Design, Implementation, Operation and Maintenance of the Regional Fare Coordination System, Attachment No. 1, Vendor Contract Costs. Seattle, WA.

fund, and project management team (Regional Team) costs. This estimate includes only regionally shared items in the RFC Project capital budget and does not include an estimated $6.4 million in individual agency implementation costs.

The cost shares are allocated among the seven participating agencies based on the proportional share of total RFC Project equipment purchased by each agency. The cost shares by partner agency are presented in Table 5.[48] The vendor contract accounts for roughly $31 million of the $42 million in capital costs. Thus, other implementation costs – e.g., joint agency project management staff, technical consultant support, sales tax, contingency fund, dispute resolution board, intellectual property management, project evaluation and customer marketing and information – that are not tied to equipment purchases but are included in the capital finance plan are similarly allocated based on relative shares of equipment purchases. Though this method was viewed as intuitive by the partner agencies and was not a particularly contentious issue in the development of the regional finance plan, the collective nature of applying the "equipment purchases" formula to the regional implementation costs does require financial accountability and accurate budgeting of these costs. One of the partner agencies expressed a need for greater financial accountability of their regionally shared costs and felt that partner agencies should have more control and involvement in RFC Project expenditures. A partner agency also noted that agency expenses are rising against a budget that hasn't changed.

[48] Carlson, Candace. February 12, 2003. Central Puget Sound Regional Fare Coordination "Smart Card" Project. Presentation delivered at FTA ITS Evaluation Kick-off Meeting. Seattle, WA.

Table 4. RFC Capital and Project Administration Costs

Cost Categories	Cost ($Nominal)
Equipment purchases[49]	$7,424,663
Installation costs	$326,728
Fare card costs	$761,006
Integration costs[50]	$511,843
Reports	$563,812
Implementation costs[51]	$12,694,940
Project management: performance security	$8,016,013
Training costs[52]	$716,375
Regional project management	$1,029,000
Regional technical consultant	$525,000
Sales tax @ 8.8%	$2,729,353
Contingency fund at 20% of vendor contract value	$6,203,076
Dispute resolution board	$122,100
Software escrow account	$99,000
Project evaluation[53]	$75,000
Project marketing	$300,000
Sound Transit consultant fee	$27,100
Total Capital and Administration Costs	**$42,125,009**

Table 5. Capital Cost Shares

Partner	KCM	CT	ST	PT	KT	WSF	ET
Equipment Share	55.2%	11.6%	10.7%	8.6%	5.9%	5.3%	2.9%

Total operations and maintenance costs over a 10-year time horizon are shown in Table 6 and are estimated at $32.8 million (nominal) and include depot maintenance, software maintenance,

[49] Equipment purchases include: on-board fare transaction processors, stand-alone fare transaction processors, portable fare transaction processors, driver display units, wireless data systems, data acquisition computers, back office computers, kits for integrating RFC system components with Sound Transit ticket vending machines, customer service terminals and photo id equipment.

[50] Integration costs include those relating to the integration of RFC equipment with existing electronic payment (e.g., ticket vending machines) and data collection systems.

[51] Implementation costs include those relating to design and development of the entire RFC system, including elements involved in card issuance and revalue functions, passenger fare payment functions, data acquisition systems, revenue management and reconciliation, agency ridership and revenue processing; and testing (end-to-end) full system functionality of all components of all systems while operating in revenue service.

[52] With respect to training costs, the vendor will be responsible for developing and conducting programs to train personnel in all aspects related to the equipment, hardware, support and diagnostic equipment and software provided under the RFC Project contract. Topics of training courses will include: RFC system overview, system operations, repair and maintenance, data management, customer service and marketing. The vendor will also be providing a "train the trainer" course designed to train supervisory personnel at participating agencies to deliver any of the required training courses.

[53] Project evaluation costs will support an internal agency before-after evaluation of the impacts of the RFC system.

customer service, card procurement and distribution, and fare card management.[54] Operations and maintenance cost shares (Table 7) are distributed among the participating agencies based on a ridership formula. For example, KCM accounts for 70.7 percent of total transit ridership in the region. Thus, KCM will be initially responsible for paying 70.7 percent of total RFC system operations and maintenance costs. In addition, King County provides central services, including card procurement, local card warehousing and distribution and new card order fulfillment, and is reimbursed based on the ridership formula.

Table 6. RFC Operations and Maintenance Costs (10 yr. total costs)[55]

Cost Categories	Cost ($Nominal)
Depot maintenance	$455,993
On-call maintenance	$604,019
Technical support maintenance	$758,053
Software maintenance	$3,809,400
Customer service	$2,846,783
Institutional programs[56]	$1,838,065
Card procurement and distribution	$1,495,014
Fare card management	$843,796
Clearinghouse services[57]	$11,188,757
Financial management	$1,541,676
Network management	$1,812,664
Revalue network support	$1,549,792
New card fulfillment	$3,820,035
Additional card procurement, inventory, warehousing and distribution functions	$254,815
Invoicing and funds collection	TBD
Total O&M Costs	**$32,818,861**

At such time as the system is determined to be at "steady state" operations (estimated one year), the operations cost-sharing formula will be based on actual transaction data. The operations and maintenance costs have been incorporated into the vendor contract, and extend out 10 years following system deployment. The partners viewed this long-term commitment on the part of ERG to the RFC system as an important component of the vendor contract.

[54] King County Metro, Community Transit, Kitsap Transit, Sound Transit, Washington State Ferries, Pierce Transit and Everett Transit. 2003. Interlocal Cooperation Agreement for Design, Implementation, Operation and Maintenance of the Regional Fare Coordination System, Attachment No. 1, Vendor Contract Costs. Seattle, WA.

[55] Maintenance costs will be paid by RFC partner agencies to the vendor for maintaining and repairing RFC system equipment and providing technical support over the phone to agency personnel. Technical support shall cover all RFC system software, hardware and system and operational processes necessary for agency operation of the system.

[56] Institutional program costs include those tied to the administration of institutional accounts (e.g., Boeing, Microsoft) under the new RFC system, including customer service, fare card management, financial management, clearinghouse services and network management.

[57] Clearinghouse services are those relating to the central management and control functions necessary to implement and operate the RFC system, including transaction processing, reconciling and settling all transactions, manage data upload and download between the financial clearinghouse system and all end points, manage system interfaces, manage fare table updates, provide the central database for system reporting, maintain and operate all clearinghouse system databases, provide and support system audits and provide reports to RFC partner agencies.

Table 7. Operations and Maintenance Cost Shares[58]

Partner	KCM	PT	ST	CT	WSF	KT	ET
Ridership-based Shares	70.7%	9.1%	7.6%	5.9%	2.8%	2.6%	1.4%

The RFC Project finance plan includes federal, local and private sources (Table 8). As of April 2003, the RFC Project had received 12 federal grants, a donation from the Boeing Company and an appropriation from ST's technology fund. As presented in Table 8, total regional revenues from these sources total $20.2 million, with a total match requirement of an additional $7.2 million.[59] The balance of capital funding is expected to be provided through partner agencies' capital budgets and an appropriation from the ST Fare Integration Fund.[60]

Table 8. Revenue Sources and Matching Fund Requirements

Revenue Source	Match Requirement	Total Award	Total Match Requirement
Federal Section 5307	20%	$9,575,958	$2,393,990
Congestion Mitigation and Air Quality	13.5%	$2,686,000	$419,202
ITS Earmarks 5288	50%	$4,421,941	$4,421,941
Boeing Donation	N/A	$500,000	0
ST Technology Fund	N/A	$3,000,000	0
Total		**$20,183,899**	**$7,235,133**

The RFC Project was awarded numerous regional grants designed to assist the project. Rather than allocating individual grants to partner agencies, the RFC partners agreed to disburse grants to agencies according to the capital purchases shares presented in Table 5. Grants are disbursed based on the equipment purchases formula, thus encouraging participation. To the extent that a partner agency expands participation in the RFC Program, both its responsibility for project costs as well as its share of total grant revenue would grow commensurate with its participation.

[58] King County Metro, Community Transit, Kitsap Transit, Sound Transit, Washington State Ferries, Pierce Transit and Everett Transit. 2003. Interlocal Cooperation Agreement for Design, Implementation, Operation and Maintenance of the Regional Fare Coordination System. Attachment No. 6, Estimated Individual Agency Operating Costs and Assumptions. Seattle, WA.
[59] King County Metro, Community Transit, Kitsap Transit, Sound Transit, Washington State Ferries, Pierce Transit and Everett Transit. 2003. Interlocal Cooperation Agreement for Design, Implementation, Operation and Maintenance of the Regional Fare Coordination System. Seattle, WA.
[60] Carlson, 2003.

8.5.2. Financial Barriers to Project Development

In 1999, Washington voters dealt a blow to the RFC Project finance plan when they repealed the state's motor vehicle excise tax (MVET) of 2.2 percent and replaced it with a flat $30 annual licensing fee on private cars and trucks. In the 1999 – 2001 biennium alone, the MVET was expected to generate roughly $1.5 billion in revenues, with 29 percent dedicated to local transit districts.[61] Prior to its repeal, MVET revenue accounted for approximately 30 percent of King County Metro's operating funds.

In response to the passage of I-695 (the MVET repeal), the Washington State Legislature passed Senate Bill 6856, which gave local governments the authority to raise sales taxes dedicated to public transit purposes up to 0.9 percent with voter approval. The legislature also provided one-time funding of $220 million in order to temporarily maintain current service levels while local agencies searched for new sources of funding.

Voters in King, Snohomish, Pierce and Kitsap counties have since approved separate increases in local sales taxes in order to close the gap created by the MVET repeal and restore public transit services. In November of 2000, King County voters approved a transit sales tax of 0.2 percent. The tax was implemented in April 2001 and KCM received the additional revenue beginning in June 2001. In May 2001, Kitsap County voters approved a 0.3 percent increase in local sales taxes for public transit. The Kitsap sales tax increase replaced approximately 75 percent of the revenue lost to I-695. In September 2001, Snohomish County voters narrowly approved a 0.3 percent increase in local sales taxes for public transit purposes. Finally, in November 2001, Pierce County voters approved a 0.3 percent transit sales tax on all retail sales within the county's PTBA.

Even with the passage of the sales tax measures, several partner agencies found it difficult to make the business case to participate in the RFC Project. Sound Transit played a significant role in assisting these agencies in overcoming financial barriers to joining the RFC Project.

Under Puget Pass, a precursor to the RFC system, Sound Transit settled receipts and distributed them to partner agencies based on passenger estimates and average fares per boarding as established by surveys conducted once every two years. Puget Pass was viewed as an interim solution until the RFC system could be implemented. The Puget Pass system subsidized riders by allowing them to pay a single fare when traveling through multiple jurisdictions. However, this practice led to revenue shortfalls to local transit agencies. Sound Transit, in turn, used funds out of its fare integration fund in order to offset a portion of these fare box shortfalls in the Puget Pass system.

Sound Transit has continued its financial commitment to local transit agencies in an effort to get them on-board with the regional fare card project. Sound Transit will fund a portion of the RFC program capital costs not covered by regional grants for Everett Transit, Pierce Transit, Community Transit and King County Metro, and will pay part of the first two years' operating costs for these agencies. The contribution to each of the partner agencies has been established

[61] Washington State Office of Financial Management. Potential Financial Impacts of I-695, The $30 License Tab Fee Initiative. August, 1999. http://www.ofm.wa.gov/i-695/695august.htm

through a series of agreements, which collectively place a cap on the ST contribution. In addition, Sound Transit has contributed $3 million to the RFC Project out of its technology fund. Sound Transit's commitment to the RFC Project and the subsidy it has provided to its partners was viewed by numerous agency representatives interviewed for this study as an important factor when making the decision to participate or drop out of the project.

8.5.3. Adding and Removing Partner Agencies

The partner agencies understand that there will be further applications of the smart card system (e.g., Olympia's Intercity Transit, the Seattle Monorail, the Tacoma Narrows Bridge, Seattle's municipal parking operations). Thus, the Interlocal Agreement considers the addition and withdrawal of parties from the RFC Project. The ILA establishes that the Joint Board must approve the terms and conditions of any addition or withdrawal from the agreement but stipulates that any new party joining the project be required to:

- pay for its equipment and any costs required to accommodate the installation and use of the equipment, and
- pay a charge to recover costs associated with the planning, design and implementation costs incurred by the RFC partner agencies.

Lesson: Build Flexibility and Creativity into the Project Finance Plan

- Build a finance plan that includes federal, state, local and private sources. Projects of regional significance are rarely financed from a single revenue source.
- Seek partnership opportunities with private partners who benefit from the technology.
- Remain flexible in dealing with the numerous financial pitfalls and issues that arise during project development.
- Consider disbursing grant funds according to capital cost shares in order to encourage participation.
- Lead agencies and partners interested in advancing the project should consider providing financial assistance (e.g., loans, fare recovery subsidies, grant sharing) to smaller or less interested partners who otherwise might not choose to participate, but whose inclusion would enhance the system.
- Recognize that a project with significant capital costs will not be funded overnight. Rather, a project's finance plan is built slowly over time as capital budgets are assessed and grant opportunities and partnering arrangements are explored.
- Recognize that initial cost estimates are rarely accurate and that project delays translate into higher capital costs.
- Establish rules for opting in and out of the program in order to encourage system expansion, which enhances visibility and program effectiveness. Recognize that the original project sponsors made a significant up-front investment in the project in system design and implementation and that agencies that later opt into the project should pay a charge to cover some of these costs.

The capital and O&M formulas established in the ILA were viewed by representatives of the Finance SAAT as appropriate for capturing costs generated by future partners. However, the second charge outlined in the ILA was also viewed as necessary in order to recover part of the sunk costs of the project paid by the originating agencies. Establishing a protocol for admitting and removing partner agencies was viewed as an important element of the agreement, one that will lay the foundation for future expansion.

8.6 Making the Business Case

The importance that each partner agency places on the financial element of the business case varies significantly. In some instances, partner agencies have constructed business cases and carefully assessed the potential benefits and impacts of the RFC Project. In others, the agencies have performed only cursory financial analyses and concluded that the project would not generate a positive return on investment. In each case where a partner agency was unable to demonstrate financial benefits, greater emphasis was placed on improving customer service, enhancing connectivity and promoting the region's economy. Thus, intangible or qualitative benefits were viewed as important in many cases as the more quantifiable financial ones.

For some partner agencies, there was an overriding need to make the business case, either due to budget pressures or financial accountability standards. For example, KCM has set a goal of recovering their capital costs of the RFC program within an estimated three-year payback period, while other agencies felt they may never be able to fully recover their costs. Financial accountability is viewed in similar terms at WSF. The WSF system represents the only state-owned and -operated partner agency. Since the repeal of the MVET, the pressure has mounted on WSF to reduce its operating subsidy. The Washington Legislative Joint Task Force on Ferries has set a 20 percent operating subsidy goal for the WSF system and the Blue Ribbon Commission on Transportation recommended that within 20 years, the WSF system should achieve a 90 percent recovery ratio.[62] In 2004, fares and other operating revenues were $128.9 million compared to $164.1 million in operating costs (78.5 percent recovery ratio). Thus, WSF has almost achieved its legislative goal and is hesitant to increase operating costs without an expectation of operational efficiencies or revenue creation.

This section of the report examines the financial benefits outlined by partner agencies when making the business case for the RFC Project. These benefits are grouped by category, including operational efficiencies, safety benefits and expanded revenue sources. This report does not attempt to quantify these benefit elements.

8.6.1. Operational Efficiencies and Productivity

Partner agencies anticipate a number of operational efficiencies as a direct result of the regional fare card system that will reduce their administrative burden and enhance productivity. These efficiencies are expected to translate into direct and indirect cost savings and enhanced

[62] The Blue Ribbon Commission on Transportation. Transportation Action: Final Recommendations to the Governor and Legislature. December, 2000. Olympia, Washington.

operations. For example, partner agencies anticipate a reduction in the costs of manufacturing, processing and distributing fare media. Administrative cost reductions are also anticipated, including those related to the monthly management of organizational accounts.

Perhaps the greatest hurdle to multi-agency fare and service initiatives in the pre-smart card world is the lack of reliable data on which to base business rules (cost and revenue sharing rules). Though the agencies have entered into some regional fare initiatives (e.g., Puget Pass), they have traditionally developed business rules based on survey data. The smart card system would generate actual transactional data that will greatly support the development of such business rules, and thus will aid in the development of truly integrated regional fare products.

A large portion (more than 80 percent) of King County's transit passes are purchased and administered by institutions – corporations and organizations – that also subsidize the value of the transit fare for their employees. Private sector businesses employ a variety of mechanisms to encourage and support their employees to use the system, and they work closely with the public transportation agencies to do that. This is made more difficult by the lack of underlying integration across the system components and by the lack of a single fare card that can serve both public transportation needs as well as offer businesses and travelers additional functionality (i.e., the ability to use the card for non-transportation purposes and transactions). The regional fare card project will help the participating agencies serve their business client base more effectively in two ways:

- The regional fare card project would significantly reduce the administrative and logistic burden of fare distribution on the organizations operating such programs. Automatic revaluing would replace a periodic administration of fare cards.
- In many cases, transportation agencies sign customized deals with organizational accounts—contracts that provide the organization with reduced costs for transit products in exchange for other travel policies implemented by the organization (such as restraining a parking benefit). Currently, for example, a visitor card is being discussed with the Convention Bureau that would offer visitors access to both transportation and convention facilities and functions. Negotiating these kinds of contracts is significantly hampered by the lack of reliable data that can be used to analyze the impact of a deal on overall transit use patterns. The regional fare card project will supply much of the data that the partner organizations need to develop effective contracts.

Finally, the regional fare card system is expected to greatly reduce the volume of cash processed by partner agencies. Reducing the cash volumes handled by the transit agencies will result in the elimination of cash counting and handling positions, thus reducing overhead costs to each agency.

Productivity enhancements are also anticipated. The proliferation of multiple fare systems and on-board hardware systems reduce operational efficiency and increase costs. For example, there are currently over 300 different types of fare media in use in the region. In addition, buses operated by each agency have multiple technological components (e.g., fare boxes and radio systems) that need to be switched on and made operational for effective revenue service. Currently the driver needs to log on to each component separately. Often drivers make mistakes, increasing the time and effort required for log-on. Sometimes they are unable to log on properly

to some sub-systems, with potential negative impacts on safety and on revenue (they may use the wrong fare setting if they log on incorrectly). As part of the regional fare card system, the agencies will be able to operate multiple on-board devices using a single easy-to-use unit. The participating agencies expect this development to be a major operational advantage. Further, use of the on-board fare transaction processors and contactless card will lead to a decrease in passenger boarding time and increased operating speeds.

8.6.2. Safety Benefits

Safety is a significant concern of transit agencies. In 2003, incidents involving transit vehicles and facilities in the U.S. resulted in 173 fatalities. These incidents involved passengers, transit facility occupants, transit agency employees, other workers, trespassers and other individuals. It is hoped that widespread use of the fare card may reduce the number of driver—passenger fare disputes.

An integrated on-board system that allows drivers easily to log onto all of a bus's component subsystems at one time could result in better communication, reduced driver distraction, and higher levels of safety. The societal cost associated with bus crashes is significant. In 2002, these costs were estimated on a per-crash basis at $32,548 (2000 dollars).[63] The average cost of a bus crash involving an incapacitating injury or fatality was estimated $323.9 thousand and $2.7 million, respectively. Thus, to the extent that the RFC system could successfully reduce the number of major incidents, the cost savings to both the participating transit agencies and society more generally could be significant.

Additional safety benefits could accrue to passengers riding the transportation systems using smart cards because they will not have to handle cash to pay fares in public.

8.6.3. Expanded Revenue

The regional fare card system is expected to increase revenue from a number of sources, including the reduction of fare theft, reduced fare evasion, expanded ridership and float management. These revenue sources were noted by several agency representatives during recent interviews and in a regional fare coordination feasibility study commissioned by the partner agencies completed in 1996.[64]

Fare theft is a significant issue to WSF. The Washington State Auditor has found "visible and glaring weaknesses in the ferry system's fare collection system. "[65] These weaknesses, which include the lack of automated systems to record the receipt of passenger and auto fares on ferries, have resulted in alleged fare theft by ticket sellers. In 2004, the Washington State Patrol arrested four WSF ticket sellers after they were observed by surveillance cameras stealing approximately

[63] Zaloshnja, Eduard and Miller, Ted. Revised Costs of Large Truck- and Bus-Involved Crashes. Prepared for the Motor Carrier Safety Administration. November 18, 2002. Washington, D.C.
[64] IBI Group. Regional Fare and Technology Coordination for Central Puget Sound. Phase I, Feasibility Study. January 1996. Seattle, WA.
[65] http://www.sonntag2004.com/Pending%20Issues.htm

$1,800 in passenger fares at WSF tollbooths. This issue is important to WSF from both a revenue and public image perspective. Washington State Ferries is currently replacing its entire fare collection system, including its point of sale terminals. The new functionality of the stored value system in combination with the automated stationary fare transaction processors will reduce cash volumes handled by ticket sellers and will greatly reduce the risk associated with theft.

The regional fare card system could also address fare evasion by reducing the number of invalid tickets, transfers and passes in circulation. Though fare evasion is considered a relatively minor issue by most of the partners, KT and ET have acknowledged that the use of outdated non-automated fare collection boxes does little to discourage fare evasion. Thus, the smart card system could also remove the ability of passengers to drop less than full fares into fare collection boxes. This source of fare evasion can lead to fare disputes, which is one of the most common sources of driver-reported incidents.

The stored value nature of the smart card and reduced reliance on cash-based transactions will accelerate the timing of transit agency revenue and result in a revenue float that the partner agencies can invest or use to reduce debt volumes. Managing the float effectively would generate new revenue for the partner agencies.

The smart card system will enhance customer service and enable riders to use a single fare medium on seven transit systems in the Central Puget Sound region. The ability to carry the single card while transferring among many systems could increase the attractiveness of the region's transit system and enhance ridership. By making the regional transit system more accessible, some partner agency representatives believe that the smart card system will be more attractive to the casual rider traveling locally on leisure or shopping trips.

The smart card technology could also enhance sales to institutional accounts by increasing the attractiveness of employer-purchased transit passes. Employers attempting to meet Commute Trip Reduction requirements will appreciate the system's card management capabilities and its ability to generate data at the transaction level. The detailed data generated by the system will enable employers to monitor the transit usage patterns of its employees and better manage their accounts. The one-time distribution of the cards and the ability to transfer unused portions of purchased fares between cards will reduce the administrative costs to the employers tied to card purchasing and management.

8.6.4. Business Case Conclusion

For some partner agencies, the financial case for involvement is paramount (i.e., WSF and KCM). Other agencies view the financial benefits of the regional fare card system skeptically but recognize the importance of the system in evolutionary terms moving the agencies into the 21st century and enhancing connectivity throughout the region. Furthermore, some agencies have expressed a concern that if the partner agencies were unable to establish a common fare system, the case could be made for a super agency taking over operations for the entire region. The ability to offer seamless fare systems as the communities of the Central Puget Sound region become increasingly interlinked advances the march toward regionalism.

Regional fare programs date back to the 1980s and Puget Pass continued that trend. However, Puget Pass was limited in scope. For example, the WSF system presently offers ship to shore passes but does not participate in Puget Pass, nor does KT. The regional fare card system expands the regional fare card system and is viewed by several of the partners as a continuation in the natural evolution of regionalism. There is a concern that agencies and communities failing to heed the call of regionalism could encounter operational barriers, experience reduced mobility and incur negative economic consequences.

Lesson: Make the Business Case from a Broad Perspective

- Recognize that the importance that each partner agency places on the financial element of the business case varies significantly. Some agencies are required to demonstrate positive returns on investment while others are more concerned with seamless interconnections between transit providers or advancing regional partnerships.
- Take a broad view when considering the numerous operational, safety and revenue benefits to system development.
- Consider the qualitative benefits (e.g., regionalism, enhanced regional connectivity) as well as the quantitative investment benefits when making the business case.
- Remember that not all partners are likely to demonstrate positive net financial returns on investment. The majority of the partners interviewed for this study were unable to make the business case by demonstrating economic benefits that exceed the costs of deployment; however, every partner recognized the ongoing trend towards an interconnected regional transportation network and were concerned that an inability to act would reduce mobility and hinder regional economic growth.

8.7 Agency-Vendor Relations

The risk management terms and conditions of the RFP presented complications to agency-vendor relations. The initial RFP required responders to post a $10,000,000 guarantee via letter of credit. Three teams responded to the initial RFP and two of them were deemed viable. It is likely that other potential bidders did not submit proposals because they were not able to post the required guarantee. The final contract requires the vendor to post ten million dollars in Performance Security at various milestone points in the contract. In order to do so, the vendor may utilize a letter of credit, performance bond or retainage.

The agencies have noted that use of a vendor from a different part of the world introduces communications lags due to time zone differences. The vendor opened a satellite office in Seattle, but some of these delays persisted because the local vendor staff did not always have the expertise or decision authority required for specific issues and, in these cases, needed to communicate with its headquarters. The vendor's training and technical personnel are in Australia, and access to them has been controlled through the vendor's local office. Installation issues that should have been addressed directly by technical vendor staff on site have been handled in a very slow process of exchanging written communication because these staff are not on site. Also, the ILA designates the Contract Administrator as the main point of contact

between the agencies and the vendor. This clearly has value in managing the work of the vendor but makes it more difficult for the individual agencies to get their needs met as they could be, if they were each able to work directly with the vendor. These issues have been recognized and steps taken to try to resolve them, but the inefficiencies associated with geographic distance and the inability of the agencies to interact directly with the vendor remain problematic.

Other problems in the project development can be attributed to imperfect communications. One problem that set back the design schedule concerned the design documents. The vendor usually uses two design phases, a Preliminary Design Review (PDR) and a Final Design Review (FDR). For the RFC Project, the partner agencies requested an additional review phase, the Conceptual Design Review (CDR), to occur before the PDR. Apparently, the requirements of the CDR were not effectively communicated because the design document produced by the vendor for the CDR generated an unexpectedly large number of comments from all of the agencies. The process of combining the comments from all seven agencies into a cohesive, non-redundant document was time consuming. In addition, the vendor needed more time than anticipated to respond to each of the comments. It seems that the volume of comments arose from a misunderstanding regarding the level of detail required for a CDR.

At the beginning of the project, the agencies and vendor created a Dispute Review Board (DRB). The role of the board is to keep the project on schedule by providing non-binding services to arbitrate and determine a fair resolution in the event that serious non-resolvable issues arise between the agencies and the vendor. The board is comprised of three members, one chosen by the agencies, one chosen by the vendor, and one jointly chosen by the two selected board members. The members were picked at the beginning of the project, as opposed to being formed only in the event of a dispute. This arrangement ensures that members are selected based on their complete set of qualifications; whereas, if the board members were only selected after an issue arose, they might be chosen based on their views on a particular topic. The RFC DRB includes a lawyer with expertise in electronic commerce, a senior public transportation official and a private consultant with technical system development expertise. On the other hand, the expense of finding and retaining the board members is incurred even if there are never any disputes that require their intervention. To date, the DRB has not been utilized for dispute resolution. The Agencies and the vendor schedule quarterly briefings for the DRB to keep the them appraised of project progress and issues.

Lesson: Selecting and Communicating with the Vendor

It is important to addresses strategies for establishing good communications and avoiding tension between the vendor and agencies.

- RFPs should be as flexible as possible and only require elements that are viewed as essential.
- Strike a balance between the specificity of the RFP and the desire to attract a range of proposals. To provide protection against the risk of default and to help assure required levels of performance, the RFC Project set a stringent monetary guarantee and schedule deliverable requirements in the vendor contract.
- Establish a clear understanding from the beginning of the vendor relationship how the process and phasing of the design development and review process will work for the project. Provide clear specifications of the content and level of detail required in the design documents.
- Consider establishing a Dispute Review Board early in the project to provide an appropriate organizational mechanism for addressing difficult issues that may arise between the agencies and the vendor.

8.8 Agency-Rider Relations

The Marketing SAAT focuses on introducing the fare card to the riding public and other issues of customer service. One of the issues addressed by the Marketing SAAT was the choice of a brand name for the fare card. Their choice will be revealed when the RFC Project is formally deployed.

Initially, it was thought that the RFC Project could generate additional revenue by selling "real estate" on the fare card, whereby a non-transit agency partner would pay to have its logo appear (in a non-obtrusive way) on the card itself. These plans have been deferred to a later date, following Full System Acceptance.

Members of the Marketing SAAT are a bit apprehensive about customer acceptance of some of the quirks of the fare card. In particular, when value is reloaded to a card via postal mail or the Internet, there will be a delay of up to 24 hours before the new value appears on the card. The reason is that buses only download information from their system at the bus garages, and only visit garages at the beginning or end of their shifts. The fare card needs to interact with the reader on the bus before it can be programmed to contain any new information on funds available.

If the revaluing takes place in person at an agency facility or a third party retailer, there will be no delay. Therefore, third party retailers will be key to the success of the fare card program. Most of the transit agencies already use third party retailers to sell passes. While most of the agencies pay a commission to the retailers, one partner agency has an agreement with an area grocery store whereby the agency permits the store to advertise for free on agency buses in exchange for selling transit passes. Understandably, the agency is unwilling to give up this relationship. Another consideration for selection of the third party retailers is that the company(ies) need to be present in all parts of the region. This may be a challenge, since the region contains urban, suburban, and rural portions.

8.9 Legal Issues

The RFC Project has confronted a variety of legal challenges, starting from the initial preparation of the RFP and negotiations with the candidate vendors to aspects of contract language, change amendments, specification of terms and conditions, intellectual property, warrantee and maintenance, indemnification against lost revenue and claims, and contractor performance security. Legal documents have had to be drafted, and important decisions with legal ramifications made and agreed upon by each of the partners. In addition, each partner agency has faced legal considerations associated with its participation in the RFC Project and its relationships with its own governing entities.

The legal issues that may arise are grounded in the choice of a governance model for the regional fare card program. In the case of the Central Puget Sound, the partner agencies chose to operate as individual agencies rather than entering into a joint powers association (a regional entity). Operating as individual agencies meant there was no provision for a legal entity or attorney designated to look out for the interests of the region.

Some of the more prominent legal issues that the regional partners have had to address in implementing the Central Puget Sound RFC Project include:

- The Joint Board, the RFC Project's governing body under the Interlocal Agreement, is not a legal entity. Moreover, the Regional Team, which manages the day-to-day project development process, is not authorized to hire a project attorney, and lacks the staff to provide even routine legal support.
- Some of the partner agencies have attorneys on their staff, while others must hire needed legal services at their own expense. Each partner agency wants legal oversight, for example in the design review phases, to look after its interests.
- The project is driven by contractual issues that require frequent legal review. The legal work required to date by the project has exceeded the originally anticipated amount and budget.
- A Legal SAAT was created to provide for deliberation on the legal issues faced by the RFC Project, but the SAAT does not have the authority to make legal decisions on behalf of the project or any of the partner agencies.

Because RFC Project governance is based on consensus among partner agencies, it was decided when framing the Interlocal Agreement that there would not be a separate legal entity to process and sign contracts; rather, each of the partner agencies would have legal signing authority. This approach implies that each agency may require separate legal counsel.

In order to facilitate the development of the RFC Project, King County Metro (KCM) has provided legal support to the Regional Team through the King County Prosecuting Attorney's office. Two KCM attorneys have been working on the project from the outset and have developed an in-depth understanding of the issues. This knowledge base represents a significant and helpful resource to the entire RFC Project. It would be difficult for other partner agencies to provide their own independent legal capability at a level that would be necessary without KCM's support. Reliance on KCM's legal staff has created some issues for KCM as well, including in

particular the increasing time required to provide support to the project, and concerns with potential conflicts of interest.

Strictly speaking, the KCM attorneys can only provide legal advice to King County, their client. For example, although the KCM attorneys have been involved in drafting project documents and change amendments, each agency must individually review and approve these documents. The legal issues encountered to date in the RFC Project are more numerous and challenging than were anticipated. There is consensus that these issues have been addressed in a very professional and successful manner under the existing agreement.

Lesson: Address Legal Issues Before and During Fare Card Implementation

- Before launching a regional fare card system, understand the range of legal issues that are likely to arise, and plan how the project will address and resolve them. It may be helpful to consult with partnerships that have already undertaken a regional fare card program, such as the Central Puget Sound RFC Project or the San Francisco Bay Area TransLink® project.
- The burden on limited legal staff or contracted legal support for partner agencies, particularly the smaller agencies, will be significant, time consuming and costly. Plan for this important need ahead of time, coordinating across all partners. If the legal staff of one agency are shared with others, recognize the potential for conflict of interest issues.
- Establish a legal committee composed of representatives of each partner agency (similar to the Central Puget Sound's legal SAAT) to identify legal issues needing attention and to help schedule, prioritize and track their resolution.
- Plan and budget to retain independent legal counsel for the project overall, allowing each agency's legal staff to work with that counsel as required. Consider establishing the governing body as a legal entity, empowered to make legally binding decisions for the partnership.

8.10 Operations

It is likely that the new fare card will affect operations in a variety of ways. Many hope that the fare card will reduce boarding time. However, some personnel in the agencies are concerned about how the fare card system will affect driver-passenger relations. In its current design, the fare card reader produces only a positive or negative beep in response to a card-swipe. If a card is denied, neither the rider nor the driver has information to identify why the card was rejected.

The agencies have included vehicle operators in their planning discussions, as members of the equipment SAAT (even though they need to pay higher wages to the participants who are performing work outside their job description). They have addressed issues such as placing the Driver Display Unit (DDU) and the card reader within reach of the operator without obstructing the view of the road, making sure the buttons are big enough and spread widely enough so that it can be operated with driving gloves on, and other human factors design aspects. Many of the agencies are replacing other onboard systems as well, and the DDU has been designed so that the driver only needs to login into it in order to be logged into all the onboard systems.

Each agency is responsible for installing the new equipment in its own vehicles, as installation is not included in the contractual vendor obligations. The installation will need to be completed in a short time frame in order to check performance and meet warranty restrictions, and to make sure that riders can all use their new fare cards on all their routes. Agencies may perform the installation in-house, hire a third party, or hire ERG for an additional fee.

9. CONCLUSIONS AND LESSONS LEARNED

9.1 Introduction

This evaluation of the Central Puget Sound Regional Fare Coordination Project has sought to understand the range of institutional issues and challenges faced by the seven participating Partner Agencies, the regional management team, and the system vendor as they have worked together to create a seamless cross-jurisdictional fare card system for public transportation travelers in the region. Data collection and the assessment process have been focused on the historical foundations for this project and the early efforts to complete an acceptable system design and configure the required hardware and software systems to support the project. The viability of these systems in practice will only become fully understood after a beta testing period and the eventual implementation of the new systems throughout the region. In this regard, this evaluation is limited to identifying a set of lessons learned in the developmental process that are expected to offer helpful insights to other agencies that may be interested in implementing their own fare card system. While the physical, geographic, demographic, political, and institutional contexts that characterize the Central Puget Sound area, the partner agencies and their customer base will not likely be replicated elsewhere, it is expected that the lessons from this experience can be readily adapted to different conditions and settings.

9.2 Summary of Lessons

This evaluation has captured its main findings in a series of lessons learned. There are of course many lessons that could be derived from the partners' experiences to date, and many more will undoubtedly emerge in the future. The lessons highlighted here seek to address the broad areas of project governance, the importance of understanding the context in which the project is being implemented, the factors that appear to motivate participation in a regional project like this one, and a number of key issues associated with project management, technology risk, project finance, and legal issues. These are the big issues that can be expected to be faced in any regional fare card project anywhere in the country. The important point is to view these lessons as a form of awareness building or sensitizing to institutional aspects of these programs that require careful consideration from the early stages of such a project. None of these lessons should be accepted uncritically; rather, their potential relevance to an evolving program should be carefully assessed in the course of program design and decision-making. With this approach in mind, it is hoped that the findings and lessons derived to date from the Central Puget Sound RFC Project will prove useful and suggestive to others who seek to implement a regional fare card project of their own.

- *Consider a "consensus" organizational model to help assure support and participation of partners in a regional fare card project.*
  Allowing each partner an equal say in decision making in the regional partnership helps build trust, understanding and buy-in by ensuring that no one agency will dominate the process. The consensus approach emphasizes the values associated with a philosophy of

regionalism over individual agency self-interest. A likely consequence of the consensus approach, however, is that it will require more staff time and cost than a structure with one lead agency. Either approach should be guided by a formal agreement, endorsed by the highest levels of management in each participating agency, which specifies roles, responsibilities and organizational structure. The Interlocal Agreement served that purpose for the Central Puget Sound RFC Project.

- *Examine the contextual factors that characterize the region and the participating agencies, and carefully manage the associated issues that will determine the success or failure of a regional fare card project.*
  Contextual factors include each agency's customer base, regional geography, agency size and services, agency governance structure, technology applications and needs, and existing fare structure. Each agency will experience a unique mix of these factors, and they need to be carefully understood with regard to their implications for regional decision making and devising good solutions in support of approaches that meet the needs of the entire region.

- *Understand the issues, strategies and trade-offs that motivate agencies to join in a regional partnership and provide appropriate support.*
  The state legislature is in a good position to recognize the region-wide value of a fare card program and can encourage broad participation. The larger partner agencies can assume more of the risks and can set a good example as early adopters of the new technologies. Central Puget Sound has benefited by having Sound Transit help underwrite some of the costs and liabilities for the smaller agencies to join the partnership, even though the project may not have appeared to "pencil out" for some of these agencies.

- *Consider the value of implementing a limited fare pass program initially to serve as an interim experience base for a comprehensive region-wide electronic fare card system.*
  The Puget Sound region benefited from several precursor fare programs that helped "break the ice" by giving travelers and agencies some experience with smaller scale implementations that demonstrated the value and viability of such fare systems. At this point in the evolution of regional fare card programs across the country, the lessons from Puget Sound and elsewhere may be just as useful as, and likely more cost-effective than, implementing limited deployments in a step-wise fashion. Nevertheless, partial implementations may still be of great value, and the individuals who gain first-hand experience with such initial fare pass programs can be of assistance in guiding the development of a full region-wide system.

- *Provide for appropriate legal support services to address the many significant legal issues faced in implementing a regional fare card project.*
  Regional fare card projects will likely face a variety of legal challenges, from the initial preparation of the RFP and negotiations with the candidate vendors to aspects of contract language, change amendments, specification of terms and conditions, intellectual property, warrantee and maintenance, indemnification against lost revenue and claims, and contractor performance security. It may be helpful to consult with partnerships that

have already undertaken a regional program to better understand the likely legal issues and ways to address them. The Central Puget Sound RFC Project established a legal advisory team to deal with these issues, and this has proven to be a very useful structure for them.

- *The technical, procedural and organizational complexity of a regional fare card program implementation suggests the need to plan for greater time, cost and management challenges than might be expected.*
  Assigning a full time Site Manager with the needed skills and experience in each partner agency seems to be a prerequisite for success. The consensus model of governance is particularly time consuming, as discussed above. It is critical to allow adequate time in the project schedule for document reviews, legal review, meeting attendance, technical integration, working with the vendor, and management oversight and coordination. Also, more time and cost will be associated with a need to modify or customize hardware and software systems than with adopting an off-the-shelf solution. Flexibility and willingness to change as the project evolves are critical organizational success factors.

- *Provide for a regional team, sufficiently staffed, to support and lead the project.*
  The Regional Team on the RFC Project includes a Contract Administrator and a Technical Manager. The Interlocal Agreement did not provide for a traditional project manager position. The Regional Team plays a crucial role in supporting the extensive regional coordination and leadership workload of a project of this magnitude, but experience to date has shown that the Regional Team has been understaffed and lacked adequate focus on standard project management activities involving project planning, scope, schedule, direction, and guidance of key elements of the project. In recognition of this need, additional resources have been provided, and a new position of Regional Implementation Manager has been created to help meet these pressing needs.

- *Anticipate, understand, address and manage the risks associated with fare card technologies and the vendor relationship.*
  The risks of modifying an off-the-shelf system or selecting a customized fare card technology (hardware and software) are potentially much greater than the risks associated with accepting an off-the-shelf technology that is already proven. One way to manage the risks is to establish a large performance security requirement at the outset of the vendor selection process to help assure that only financially secure firms are likely to respond. It is preferable to select a vendor with established electronic fare card systems deployed elsewhere that also meet most of the requirements of the project. This helps avoid the risks of adopting unproven technologies. Customized software may need to be developed in order to accommodate the partners' existing legacy systems with which a new fare card system must be integrated. These risks usually cannot be avoided, though in the case of Puget Sound not all the partner agencies required integration with legacy systems. Other ways to control risk include (1) establishing an escrow account for source code and documentation to protect against the risk of vendor default, and contractually require the vendor to deposit its proprietary source code, build documentation, and periodically update them, (2) requiring a conservative payment schedule that allows for major milestone payments at limited points in the contract, each associated with a

significant and satisfactory completion of work, and (3) requiring extensive and comprehensive insurance coverage from the vendor.

- *Understand the fare policy objectives and fare structure of each partner agency and establish a regional framework that can accommodate these different structures and is viable for all the partners.*
  The Central Puget Sound partner agencies selected a coordinated fare arrangement that enables passengers to use a single fare medium but allows partner agencies to retain autonomy in setting their fare policies. The main alternative is an integrated fare structure that operates on a single standard when calculating fares. The coordinated regional framework is likely to be perceived by the customer as more complicated and to entail greater programming costs for the agencies.

- *Complex regional fare card projects likely will involve finance plans that include a diverse array of funding sources and demand significant flexibility and creativity on the part of the partner agencies.*
  The Central Puget Sound RFC Project finance plan includes federal, local and private funding sources. A unique aspect of this project is the provision of funding to selected partner agencies by Sound Transit to subsidize the first few years of capital and operating costs. This early financial support has been a critical factor in encouraging several of the partner agencies to participate in the regional program.

While these lessons address many of the larger issues associated with the implementation of a regional fare card program, they by no means cover them all. Recognizing the nature of these issues and seeking to address them early in program development will, however, help agencies anticipate many of the governance and policy challenges inherent in such programs and avoid many of the major pitfalls. Following the example and experience of the Central Puget Sound RFC Project to date, and the experiences and lessons of the other fare card systems around the country offers perhaps the best opportunity to identify a path to successful project implementation that will fit the needs of any other place seeking to set up this kind of fare system. Working with these examples, the challenge will be to adapt them to successfully fit the needs and conditions of the region and the participant agencies.

GLOSSARY OF TERMS

Term	Definition
AASHTO	American Association of State Highway and Transportation Officials
ACH	Automated Clearinghouse
AFC	Automated Fare Collection
AVL	Automated Vehicle Location
BAFO	Best and Final Offer
Caltrans	California Department of Transportation
CBD	Central Business District
CDR	Conceptual Design Review
CEO	Chief Executive Officer
CT	Community Transit
CTA	Chicago Transit Authority
CTPP	Census Transportation Planning Package
DDU	Driver Display Unit
DRB	Dispute Review Board
ERG	ERG Transit Systems (USA), Inc.
ET	Everett Transit
FDR	Final Design Review
FHWA	Federal Highway Administration
FOT	Field Operational Test
FTA	Federal Transit Administration
FTE	Full Time Equivalent
GPS	Geographic Positioning System
ILA	Interlocal Agreement
IPAS	ITS Program Assessment Support
IS	Information System
ITS	Intelligent Transportation System
JPO	Joint Program Office
KCM	King County Metro
MARTA	Metropolitan Atlanta Rapid Transit Authority
MTC	Metropolitan Transportation Commission
MVET	Motor Vehicle Excise Tax
NSF	Not Sufficient Funds
OBFTP	On-Board Fare Transaction Processor
PATH	Partnership for Advanced Transit and Highway
PDR	Preliminary Design Review

GLOSSARY OF TERMS (continued)

Term	Definition
PIU	Passenger Interface Unit
PSNS	Puget Sound Naval Shipyard
PT	Pierce Transit
PTBA	Public Transit Benefit Area
PTCC	Partnership Transit Coordination Committee
RATP	Régie Autonome des Transports Parisien
RF	Radio Frequency
RFC	Regional Fare Coordination
RFI	Request for Information
RFP	Request for Proposal
RTA	Regional Transit Authority
SAAT	Subject Area Advisory Team
SOW	Statement of Work
SSAG	Senior Staff Advisory Group
ST	Sound Transit
TBD	To Be Determined
TCRP	Transit Cooperative Research Program
TTI	Texas Transportation Institute
USDOT	U.S. Department of Transportation
VCTC	Ventura County Transportation Commission
VTA	Valley Transportation Authority
WSF	Washington State Ferries

ACKNOWLEDGEMENTS

We would like to thank Joe Peters of the Federal Highway Administration's ITS Joint Program Office for his support in funding this project, Sean Ricketson of the Federal Transit Administration for his assistance in task management, and Pierre Youssef of Mitretek for his advice and support. Candace Carlson, the Contract Administrator for the Regional Fare Coordination Project, was our principal point of contact, and she and the members of her Regional Team provided substantial assistance and time throughout the evaluation answering our questions, providing backup materials, and facilitating contacts throughout the Puget Sound region. We want to thank in particular the Site Managers of each of the seven partner agencies and their respective agency teams, as well as representatives of ERG, the RFC Project vendor, for helping us understand the complexities and nuances of their involvement in this regional project. Representatives of the regional offices of the FHWA and FTA were helpful and supportive throughout. Despite the very considerable amount of work on the part of these individuals to develop and implement the fare card project, each took the time to explain the project to us and answer our many questions. The evaluation team is grateful for this kind assistance.