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16. Abstract

Many regions across the country have more than one transit agency providing vital public transportation services. While a transit agency may see their role limited by a jurisdictional boundary, transit riders' commutes know no such political boundaries. For those riders whose commutes are reliant on one or more transit agencies, a fractured fare system among the various transit agencies they ride means higher user costs. This study will examine the history of regional fare integration in the New Orleans metropolitan region, and the challenges and successes of varying approaches taken by transit agencies in various metropolitan regions, to reveal options for achieving regional fare integration in New Orleans today.

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Achieving Regional Fare Integration in New Orleans:

Innovative Cost Sharing Arrangements and Technologies

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Executive Summary

In 1979, the Louisiana State legislature created the New Orleans Regional Transit Authority (NORTA), granting it the authority to operate public transit service in the New Orleans metropolitan area. However, each parish needed to vote to allow NORTA to handle their parish's transit operations. As a result, truly regional transit never materialized, and two separate transit agencies (NORTA and Jefferson Transit [JET]) currently serve the bulk of the New Orleans region's population.

Many regions across the country have more than one transit agency providing vital public transportation services. While a transit agency may see their role limited by a jurisdictional boundary, transit riders' commutes know no such political boundaries. For those riders whose commutes are reliant on one or more transit agencies, a fractured fare system among the various transit agencies means higher user costs. As metropolitan regions in the United States have grown, there has been an increased dispersal of travel patterns, forcing transit agencies to continually refine service design. Within this context, there has been a growing emphasis on the development of multi-agency agreements and integrated regional payment arrangements in an effort to provide seamless travel for transit users traveling across multiple jurisdictions

This study examines the history of regional fare integration in the New Orleans metropolitan region and the challenges and successes of varying regional approaches taken by transit agencies in other metropolitan areas to reveal options for achieving regional fare integration in New Orleans today. Through a review of the literature, an examination of New Orleans' previous attempts to improve regional coordination and fare integration, and case studies from around the country, this study finds that regional integration efforts are fairly new in the United States. Many regions in the country are implementing regional fare integration, but most efforts have occurred in only the last 15 years. There are still many lessons to be learned and many new ways to structure integration efforts. New Orleans' own previous effort to create a regional day pass, for example, successfully helped riders who needed to travel between parishes, but of insufficient benefit to either transit agency to justify the inconvenience and expense of the program's management. However, the coordination of farebox technology between JET and NORTA since 2005 has removed a major obstacle for regional fare integration. The lack of technological hurdles means that any future integration endeavors need not worry about capital expenses associated with the adoption of new fare media.

In order to achieve regional fare integration, however, technological compatibility is only the beginning. This research finds that several guiding principles must be considered in order to facilitate successful regional transit coordination, including:

- the identification of an institutional champion to direct the integration implementation process;
- clear commitment, investment, and communication from all organizations and individuals involved;
- a clear understanding of how fare integration will impact revenue, costs, and ridership for each involved agency; and
- an incremental approach and development of contingency plans to address unexpected events and complexities

Different regions will require different solutions for regional integration. Based on the literature review, case studies and stakeholder interviews completed in the course of this study, the authors propose the following recommendations for the New Orleans area:

1. The New Orleans Regional Planning Commission (RPC) should serve as the "project champion."
2. Rather than trying to do too much early on, the agencies should consider simply bringing back the regional day pass, using technology already utilized by both agencies.
3. In the long term transit users will be better served by a coordinated fare structure across agency service areas. Further study is needed by JET and NORTA to align fare structures and facilitate the development of a regional fare system that can be used for all trips.

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Acknowledgment:

1. Introduction

Many regions across the country have more than one transit agency providing vital public transportation services. While a transit agency may see their role limited by a jurisdictional boundary, transit riders' commutes know no such political boundaries. For those riders whose commutes are reliant on one or more transit agencies, a fractured fare system among the various transit agencies means higher user costs.

Regional fare integration requires participating transit agencies to evaluate and negotiate on a broad range of considerations, including, but not limited to:

- Establishing a financial and governance framework
- Setting a system procurement strategy;
- Setting a unified fare policy for the region;
- Developing technical system architecture to support the integration;
- Staging an effective implementation strategy;
- Establishing revenue settlement and data-sharing procedures; and
- Developing joint customer service functions.

The variety of considerations makes negotiating regional fare integration a complex undertaking for transit agencies.

1.1 Problem Statement

Prior to the devastation wreaked on the New Orleans region following the levee failure associated with Hurricane Katrina in 2005, a regional day pass provided full access to both the New Orleans Regional Transit Authority's and Jefferson Transit's bus and streetcar network. Since the flooding in 2005, both transit agencies have undergone extensive transformations while recovering from the disaster. However, neither has made an effort to restore the regional day pass; the absence of an integrated regional fare option leads to inconveniences and higher fare payments for transit riders who are dependent on both systems for regular travel.

1.2 Study Objectives

This study will evaluate varying approaches to regional transit fare integration, identifying best practices in cost sharing and the use of new technologies, to make recommendations to advance a unified fare policy in the New Orleans metropolitan area.

1.3 Approach and Methodology

This study examines the history of regional fare integration in the New Orleans metropolitan region, and the challenges and successes of varying regional approaches taken by transit agencies in other metropolitan areas, to reveal options for achieving regional fare integration in New Orleans today.

The project methodology consisted of the following tasks:

1. Development of a case study of the historical regional day pass that existed for the New Orleans Regional Transit Authority (NORTA) and Jefferson Transit (JET) systems
    a. Interviews of staff, agency personnel and public officials with NORTA, Regional Planning Commission, and JET to understand the historical regional fare integration.
    b. Identification of what technology, policy, legal and other infrastructure was associated with the regional day pass arrangement.
    c. Review of available historical data related to pre-Katrina regional day pass usage and fare revenue sharing between JET and the RTA.
2. Document any changes to the governance, fare collection, fare policy or management structures of JET and the RTA post-Katrina that could impact future unified fare proposals.
3. Conduct a literature review to identify and evaluate research on regional fare integration cost sharing arrangements and fare technologies.
    a. Review TCRP Report 94: Fare Policies, Structures and Programs Updated.
    b. Identify and review other relevant research.
4. Develop three to five case studies of metropolitan areas that have implemented regional fare integration.
    a. Select three to five metropolitan regions that have taken varied approaches to regional fare integration.

b. Identify the financial and governance framework, procurement strategy, unified fare policy, technical systems, implementation process, revenue settlement and data-sharing procedures and joint customer functions associated with each case study.

5. Synthesize the research and case studies to develop a series of best practices for regional fare integration and recommendations to advance efforts in the New Orleans metropolitan region.

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2. Literature Review

2.1 Introduction

As metropolitan regions in the United States have grown, there has been an increased dispersal of travel patterns, forcing transit agencies to continually refine service design (TCRP 2003a, p.72). Within this context, there has been a growing emphasis on the development of multi-agency agreements and integrated regional payment arrangements in an effort to provide seamless travel for transit users traveling across multiple jurisdictions (TCRP 2003a, p.72).

To integrate fares across a region with multiple agencies, partnership agreements are typically needed to establish responsibilities, ownership, and allocation of costs and revenues. A separate clearing house, such a regional authority or commission, or a back-end payment settlement system can be developed to manage these processes, but all participating agencies must reach agreement on revenue management policies and procedures. In order to reach such an agreement, there are a number of important areas that need to be addressed: fare policy, structure and technology (TCRP 2003a, p.72). This literature review is intended to provide a summary of lessons learned from integration efforts conducted by other cities throughout the country.

2.2 Fare Policy

The fare policy a transit agency adopts establishes the principles and goals underlying and guiding the agency's pricing related decisions (Jenks 2003). While some agencies establish formal fare policies that govern fare related decisions, most agencies' fare system changes are made in response to a particular issue or problem (TCRP 2003a, p. 13; Jenks 2003). A formal fare policy supports a regular review of fare structure and technology, thus creating a predictable and consistent time cycle for changes to fare structure. Miami-Dade Transit in Florida, for example, has a policy of reevaluating their fare structure on an annual basis (Joslin 2010). This allows them to adapt their fare structure to changing factors in the region and address potential problems in a timely manner.

Because of the multi-agency nature of regional fare integration, it is important for participating agencies to have clear fare policies so that agencies are approaching their respective fare structures

and/or fare integration with similar or compatible principles and goals (Joslin 2010). Ideally, each participating agency adopts a fare policy to make regional fare integration a clear priority.

2.3 Fare Structure

Basic fare structures tend to fall into two general categories: flat and differentiated. In a flat fare structure, riders are charged the same fare regardless of the length of the trip, time of day, or other factors. Alternatively, fares can be differentiated by one or more parameters, resulting in distance based or zonal fares, time-based (peak/off-peak) and/or service based differences such as express vs. regular service. Flat fare structures are preferred by most transit agencies because they are simpler for riders to use and easier for agencies to administer. However, many have debated that differentiated fares can enable the generation of higher revenues by charging more for longer trips and/or for peak –hour travel (TCRP 2003b).

Transfer pricing and policy is another important part of any fare structure. Numerous transit systems are designed to require many riders to transfer from one transit line to another to complete their trips. Therefore, the pricing, rules and policy regarding transfers are fundamental aspects of an agency's fare structure. While certainly important for the rider, transfer pricing and rules can represent major issues for operators, particularly when onboard fare payment is occurring, because they are the ones administering the rules on a day-to-day basis. The simpler the transfer rules, and the simpler the overall fare structure, the easier it is for the operator. Free or low-priced transfers are common, but agencies must consider the trade-off between convenience of the transfer and the foregone revenue and other administrative issues for the operator.

When considering regional fare integration, it is very important to ensure the participating agencies have similar and compatible fare structures. Agencies with identical fare structures, such as equal base fares, have an easier time integrating because they don't have to change their fare pricing or rules. Similar transfer policy also makes it easier, especially if the participating agencies decide to accept transfer tickets from each other (Joslin 2010).

2.4 Fare Technology

An increasing number of transit agencies are implementing automated fare payment strategies. The use of electronic payment has influenced fare policy and facilitated the introduction of a range of payment options. Partnering transit agencies with compatible payment technologies have a great deal of flexibility in the manner they implement fare integration (TCPR 2003a, p. 26). An automated payment card can be encoded with multiple fare options for use in multiple transit systems. The three main types of automated payment technology are magnetic stripe passes, flash passes, and smart cards.

Magnetic strip cards use a paper or thin-gauge plastic instrument containing a magnetic stripe on which pertinent fare data is stored. The pass may simply have a balance from which fares are deducted or serve as a transfer ticket or day pass. NORTA and JET currently use paper magnetic stripe cards to provide change to riders and transfer tickets. NORTA also uses the cards for all day passes. NORTA is also preparing to launch mobile ticketing powered by Masabi.

Flash cards are paper or plastic cards that display a unique appearance, associated with the period or form of validity. Patrons present, or flash, the card to the operator for visual confirmation of the instrument's validity for the period and journey. Washington DC, for example, uses flash cards for their weekly bus passes, changing the color each week.

Smart cards are a fairly new form of fare media. They consist of a plastic card containing a computer chip and antenna device on which data are placed upon agency receipt of appropriate payment. Smart cards, such as the ORCA card used the Seattle area, allow patrons to encode numerous fare options onto a single card. In Washington DC, smart cards are used to calculate zone based fares for use of their metro system and for the varying fare prices between rail to bus, bus to rail and bus to bus transfers, without requiring the patron to do anything more than tap their card onto a reader.

Fare collection technology is critical to regional fare integration. The greater the compatibility of the fare collection systems, the easier it is to administer the regional fare program. Furthermore, the type of technology employed can have significant impact on the effectiveness of a regional fare system. A smart card of magnetic stripe system can be very effective in the implementation of a regional fare, especially if the participating agencies have identical fare structures.

2.5 Developing a Regional Fare System

In order to develop a regional fare system, many issues and concerns need to be addressed and dealt with. Recent experience related to regional fare programs found that an emphasis must be placed on the following areas (Joslin 2010):

- *Institutional Arrangements:* Who are the participants in the regional program, how is such a program organized and operated, and what are the legal and regulatory requirements that must be addressed?

- *Technological Impacts*: What types of fare technology issues influence individual or agency programs, what are the design requirements, what are compatibility and transitional issues?

- *Customer Related*: To what extent will customers participate in the development of a regional program, what are the benefits, barriers and implementation issues for customers, and what privacy issues may exist?

- *Data Processing*: What new data will be derived from the technological advances and how will the data improve planning and marketing efforts and allow for better allocation of fare resources among regional partners?

- *Costs and Benefits:* What are the capital costs associated with the advancement of fare technology, what savings might be achieved in other areas, and what impact will the technological or policy changes have on ridership?

2.5.1 Institutional Arrangements

A number of institutional issues must be addressed as agencies move forward in implementing a regional fare policy. There are three important institutional components that must be addressed: project approach, agreements, and finances.

Project Approach

It is critical to the success of a regional fare project to bring all potential partners to the table and establish participant buy-in at the initiation of the project. This should include all involved transit operators, local governments, and regional governance and planning organizations. A critical decision that must be made early on is whether to use a "lead agency" or "consensus model" to govern and guide the project (Joslin 2010).

The lead agency approach is most useful when one of the participating agencies has significantly fewer barriers to implementation than the other agencies. These barriers include the relative size of the agency when compared to the regional systems; the availability of capital and technical resources and expertise to implement a new project; and existing policy and/or political backing to move forward. The "lead agency" approach is sometimes referred to as the "efficiency model" because it is the more time-efficient approach due its simplification of the decision making process (Joslin 2010 p. 4-4).

In South Florida, Miami-Dade Transit (MDT) used a lead agency approach for regional fare integration because they were most able, in terms of resources and policy, to move forward with regional integration. They made the initial investment in a fare collection system and formed the backbone of a regional system that included future interoperability with the other major transit operators. MDT consulted with and accepted input from the other potential transit partners, however, the final policy decisions were made exclusively by Miami-Dade County Board of County Commissioners. Washington Metro Area Transit Authority (WMATA) used a similar model in its partnership with the Northern Virginia Transportation Commission for the SmartTrip regional fare collection system.

In the consensus model, all the participating agencies have an equal voice in the decision-making process of the project. This model was used in the Central Puget Sound Regional Fare Coordination (RFC) project because the smaller partners did not want the larger agencies to dominate the process and decision-making. This approach provides equal representation for all partners and requires frequent meetings, strong communication, and a more time-consuming process (Eno 2014).

In both cases the need for a "project champion" is significant (Miller 2005). The project champion can be an individual or an agency and will serve as the catalyst to bring all the parties together and keep the project on track.

Agreements

At the start of a regional fare project, formalized agreements between participating agencies and partners must be developed and ratified. These will provide the structure and goals to guide the process, develop consensus, make implementation decisions and detail the roles of all partners (Miller 2005; Joslin 2010). It is recommended that formal agreements include the following fundamentals:

- Establishing a policy group to set policies and specific objectives;
- Creating and empowering one or more technical committees to develop detailed operating and technology standards;
- Detailing a mechanism for determining funding shares and requirements; and
- Obtaining technical expertise and recourses for the project development, design, and implementation.

When developing agreements it is important to recognize that smaller transit agencies may not have the necessary resources – financial, staffing, expertise, etc. – to fully implement every part of the regional fare agreement on their own. Furthermore, when multiple transit agencies are participating, total independence for each agency is not possible. The nature of the cooperative project requires that some decisions that, prior to the project may have been previously done internally, be done in conjunction with partner agencies. Finally, it is important to take advantage of the strengths of each partner, especially those of large, regional partners. Each partner may bring a unique ability or resource that should be utilized to maximize successful implementation of the project. For example, a regional entity like an MPO may be uniquely positioned to coordinate the attainment and distribution of capital funds from state and federal sources.

Financial Issues

For a regional fare policy or integrated fare system to be successful, several financial issues must be addressed and resolved prior to implementation. First, if possible, a coordinated fare structure should be developed between agencies. Second, partners must determine funding splits for any capital, implementation, and operating expenses. Third, for ongoing operations, the roles, responsibilities, and costs must be established. Forth, all clearinghouse responsibilities and roles must be established, as

appropriate. And finally, revenue controls and shares must be determined. This includes the methods by which revenue sharing and reimbursements are to be calculated (Joslin 2010; Miller 2005; TCRP 2003a).

2.5.2 Technological Impacts

The fare technology available and the technology chosen to implement a regional fare system are very important. First, it is vital to determine the existing capacity of each agency. If a fare technology that is compatible with the systems of each agency is adequate for the project, then that technology is likely the best option. The extent to which capital costs can be reduced or avoided simply maximizes the net benefit of the project.

The type of technology selected also depends on the fare structure adopted regionally or used by each agency. Because of its simplicity, a flat fare structure can be implemented using older technology like magnetic stripe cards and flash cards. However, smart cards are recommended for systems with differentiated fare structures. Not to be forgotten in this step are the needs of the customers. The greater the number of fare media a transit rider needs to utilize the entire system, the worse her experience will be. The ORCA card used by the Central Puget Sound RFC and the SmartTrip card used by WMATA are excellent examples of technology used to implement regional fare integration without burdening transit users.

The type of fare technology used also affects data gathering and processing abilities. Magnetic stripe and smart card fare media allow for a greater tracking of individual trips and allow agencies to better understand the travel patterns of transit users. However, issues regarding the privacy and security of personal data, especially in the case of smart cards, need to be addressed.

2.5.3 Data Processing

If a magnetic stripe or smart card technology is used to implement a regional fare system, participating agencies will be able to track regional travel by the individual trip. They will be able to see where an individual started and ended their trip and what transfers they made to get there. This data can be extremely valuable because it may be the only real-time, person level travel data of its kind in the region. The extent to which this data is collected and used to inform transit agency functions is very important.

2.5.4 Customer Involvement and Acceptance

During the planning process, the transit users must not be forgotten. It is important to solicit input from current transit users to determine how they use the system and what sort of changes they are willing to accept or tolerate. Changes in fare media will require a period of adoption for transit users and a new fare media might require additional capital expense in order to make sure users can have simple and convenient access to purchase it.

The cost of adopting and the ease of adoption also carry with them serious issues. During initial implementation of the SmarTrip card, WMATA only sold the new smart cards at a few metro stations. Thus, frequent users of the metro system adopted the new fare media much earlier than frequent users of the bus system. One of the expected benefits of the smart card was improved boarding time for buses, but because most regular bus riders did not have easy access to purchase a new SmarTrip card, that benefit wasn't realized until an investment was made in greater distribution of places ways to purchase the card (Joslin 2010).

2.5.5 Costs and Benefits

Once questions in the other areas are addressed, a cost/benefit analysis of the project can be conducted. It's important to make sure clear goals and priorities are established ahead of time. Otherwise a particular issue, such as the financial bottom line, may skew the analysis away from other priorities, such as customer service and access.

3. Findings

This section summarizes findings from both local research into New Orleans' history of regional transit cooperation, as well as three case studies from around the U.S. which provide instructive examples of opportunities and challenges in developing a regionally integrated transit network that effectively serves users.

3.1 New Orleans Case Study

3.1.1 History of Transit in New Orleans Region: (Orleans & Jefferson Parishes)

The New Orleans Public Service Inc. (NOPSI) was established in the 1920s to provide public transit in Orleans Parish. For the next 60 years, NOPSI managed public transit in New Orleans, starting with streetcars and then adding buses in the 1930s. In 1979, the Louisiana State legislature created the New Orleans Regional Transit Authority (NORTA), granting it the authority to operate public transit service in the New Orleans metropolitan area. However, each parish needed to vote to allow NORTA to handle their parish's transit operations. By 1983, NORTA was fully responsible for the operation and maintenance of all the bus and streetcar lines in Orleans Parish.

In Jefferson Parish, public transit had been provided by a number of different private companies since the 1930s. In 1990 the parish government created the Jefferson Parish Department of Transit Administration, known today as Jefferson Parish Transit (JET). JET took responsibility for overseeing the private management companies contracted to operate the transit system in the parish. Until 2006, Jefferson Parish contracted fixed-route operations of Eastbank and Westbank public transit under two separate management companies: Louisiana Transit Co. (LTC) for the Eastbank and American Transit Co. (ATC) for the Westbank.

3.1.2 Regional Pass Implementation

The regional day pass was implemented in July of 1999 and was in use until April of 2004. The pass was proposed by Sharon Leader (Leader 2014; Bruen 2014; Roesel and Sappington 2014), a regional planner working with NORTA, JET and RPC. She recognized that the transit trips of many people in the region often crossed from one parish to the other, resulting in many people paying two fares, one to NORTA

and one to JET to make a single trip. She saw the regional day pass as a way to make travel easier and cheaper for transit riders.

With the support of executive staff in NORTA and JET, a meeting was convened with representatives from numerous stakeholders: the NORTA Board of Directors and executive staff, JET representatives, New Orleans Mayor Marc Morial, and Jefferson Parish president Tim Coulon. Both Mayor Morial and President Coulon strongly supported the idea of a regional day pass, agreeing that it would help transit-dependent residents of both parishes. With the political backing of the Mayor and Parish President, NORTA and JET agreed to implement the day pass on a pilot program basis (Leader 2014; Bruen 2014; Roesel and Sappington 2014).

3.1.3 Implementation

Technology of Day Pass

When the regional day pass was in use, JET and NORTA did not have compatible fare box technology systems, so a simple card and stub system was implemented for the regional day pass (Roesel and Sappington 2014; Bruen 2014). A person would purchase a day pass when boarding the bus at the start of their trip and use that pass when transferring to a bus in the other system. When transferring, the rider would hand the operator the day pass and the operator would remove and keep a stub from the top of the pass, indicating a transfer has been used, and return the pass to the rider for continued use throughout the day. A stub was only removed from the pass when transferring from NORTA to JET lines or vice versa. A stub was not removed when transferring from one bus to another within the same system (Leader 2014). Each day pass had five stubs, allowing a rider to transfer between RTA and JET systems up to five times in one day.

Financial Agreement

In order to make the regional day pass financially feasible, NORTA and JET agreed to a monthly reimbursement system to offset the cost of rider transfers between systems. Each transit rider's fare for a day pass was split proportionally between the two agencies. This split was determined by comparing the number of passes sold and the number of transfer stubs collected by each agency. The agency that sold more passes paid the calculated amount owed to the agency that collected more transfer stubs

Overall Results of the Day Pass

During the five years the regional day pass was in effect, an average of 64,680 passes were sold each month. Of those passes, 80% were purchased by people starting their trips in Orleans Parish. The remaining 20% of passes were sold in Jefferson Parish, almost evenly divided between the east and west banks of the parish. The collection of transfer stubs, however, was skewed in favor of JET (See Table 1). About 60% of all transfer stubs were collected by JET, with 50% being collected on the Eastbank by LTC and 10% being collected on the Westbank by ATC. NORTA collected the remaining 40% of the stubs.

Table 1: Regional Day Pass Sales and Stub Collection: Monthly Average

	Passes Sold		Stubs Collected	
	Total #	Percent	Total #	Percent
NORTA	51,882	80.2%	8,876	39.3%
JET:				
LTC - Eastbank	6,726	10.4%	11,357	50.3%
ATC - Westbank	6,072	9.4%	2,356	10.4%
Total:	**64,680**	**100.0%**	**22,589**	**100.0%**

Aside from the percentages, it is important to note the absolute numbers. On average, 64,700 passes were sold each month, but only 22,600 stubs were being collected. This means that about 65% of the passes sold were never used outside of their parish of origin. Those 42,100 people were instead using the passes to travel within their home parish, with the majority of such being in Orleans Parish.

Since all the stubs collected in one parish would have been sold in another, it is easy to determine how many people were actually using the pass to travel across parish lines. Of the 51,882 day passes purchased in Orleans Parish, only 13,713 were used to transfer to JET buses, based on the stubs collected – meaning that only 26% of Orleans Parish riders purchasing day passes transferred to JET buses. The other 74% of Orleans Parish riders were not transferring to JET lines; instead, they were

using the pass to ride solely within the NORTA system. In the reverse direction, a larger percentage of JET riders were using the day pass to transfer from JET to NORTA transit lines. JET was selling 12,798 regional day passes a month. NORTA was collecting 8,876 stubs per month, accounting for 69% of all JET day pass riders.

A number of the transit riders interviewed did state that collection of the stubs from the day pass was inconsistent. This means that more people may have been using the day pass to travel between parishes than the numbers indicate. It is, however, unlikely that this failure by bus operators to collect the stubs was so widespread and pervasive that it can account for the significant difference between the number of passes sold and stubs collected on a monthly basis.

Based on the reimbursement agreement between the JET and NORTA, the agency that collected more stubs would receive a check from the other agency each month. Each stub was valued at one-half the price of the day pass. Because JET consistently collected more stubs, the NORTA was required to reimburse JET each month. The average monthly payment from the NORTA to JET was $16,496.11 during the five years the regional day pass was available.

3.1.4 Day Pass Fare Increase

In January of 2003, JET and NORTA agreed to increase the cost of the day pass from $4 to $5 (Breun, 2014; Leader, 2014). This change in price affected the sales and usage of the day pass. When implemented, the regional day pass cost $4. The standard fare for NORTA at the time was $1.25 and a transfer was $0.25. Prior to the day pass, a rider making three trips in a day – such as a person taking the bus to work in the morning then running an errand in the afternoon before going home – would pay $3.75 for three full fares. If at least one of those legs required a transfer, the daily cost would be $4, the same as the day pass. So why would people opt for the day pass if the overall cost was likely to be similar? According to Gloria Moncada, a NORTA and JET rider for many years, the day pass gave riders a great deal of flexibility when taking transit. A person with a day pass could make extra trips and/or transfers without being burdened by the cost of additional fares (Moncada 2014). This flexibility was most pronounced in New Orleans where the transit system was more comprehensive, making transit a more viable transportation option. This use of the regional day pass for intra-parish travel helps explain the difference between passes sold and stubs collected.

In Jefferson Parish, this difference was less significant. The standard fare in 1999 was $1.00 with transfers costing $0.50. This cheaper fare made the day pass less economical unless the rider was

transferring to a NORTA route or if they were going to spend more than $4 on transit fares within Jefferson Parish. Furthermore, JET operated fewer routes with less frequent service throughout Jefferson Parish than the NORTA did in New Orleans. This meant that transit was a less viable transportation option for Jefferson Parish residents.

Table 2: Regional Day Pass Sales and Stub Collection: Change in Monthly Average

	Passes Sold			Stubs Collected		
	$4 Fare	$5 Fare	% Change	$4 Fare	$5 Fare	% Change
NORTA	51,116	54,045	5.7%	9,375	7,440	-20.6%
JET:						
Eastbank	7,246	5,283	-27.1%	11,998	9,474	-21.0%
Westbank	6,448	4,986	-22.7%	2,399	2,216	-7.6%
Total:	**64,810**	**64,314**	-0.8%	**23,772**	**19,130**	-19.5%

Note: The regional day pass cost $4 from July 1999 to December 2002 and then cost $5 from January 2003 to April 2004.

When the cost of a day pass was increased to $5 in January of 2003, sales of the regional day pass decreased (Bruen 2014). Breaking down this decrease by parish, we actually see a 5.7% increase in day pass usage in Orleans Parish and a 27% and 22.7% reduction for the east and west banks of Jefferson Parish, respectively. However, because Orleans Parish accounted for the overwhelming majority of day passes sold, the overall reduction in passes sold was only 0.8%.

3.1.5 Effect on Overall Ridership

The effect of the regional day pass on overall ridership for JET and NORTA is difficult to determine, because much of both agencies' ridership data was lost in Hurricane Katrina when many transit facilities and offices throughout the region were flooded. However, all the officials interviewed stated that the regional day pass helped increase ridership, particularly for JET. NORTA already operated a large transit

system with significant ridership, but JET's system was much smaller and had significantly lower ridership (Roesel, 2014; Breun, 2014; Leader, 2014). The regional day pass made it easier for the people living in Orleans Parish and working in Jefferson Parish to commute to work, resulting in an increase in ridership on Jefferson Parish lines.

3.1.6 Pass Ending

The decision to eliminate the program was mutual, with NORTA and JET agreeing to end the pass, but for different reasons. NORTA officials didn't like having to write a check to JET each month, albeit for a minimal amount, and felt that they were not getting enough increased ridership from the day pass to justify continuing the agreement (Roesel and Sappington 2014). JET found that even though they had increased ridership, they also had decreased revenue (Breun 2014).

When first implemented, Jefferson Parish received $2 for each Orleans Parish resident that used the day pass to travel into Jefferson Parish. Without the day pass, the same rider would have to pay at least $2 and as much as $3 to go in and out of Jefferson Parish, depending on whether they needed to transfer within the JET system. Since many riders were using transfers, JET was losing close to $1 per rider per day because of the day pass. The increase in the day pass fare from $4 to $5 was done to address this financial shortfall, but it resulted in reduced usage of the day pass and simply compounded the financial concerns JET had with the day pass (Bruen 2014).

3.1.7 Current Conditions for the Day Pass

In the 10 years since the regional day pass ended, transit in Orleans and Jefferson Parish has undergone a significant amount of change. Hurricane Katrina upended much of the transit system in the New Orleans area. After Katrina, NORTA and JET both contracted out all, or a major portion of the provision of transit services to a private company, Veolia Transportation (now re-named Transdev). Transdev holds contracts separately, with each agency. NORTA contracted Transdev to handle all planning, management and operations through a delegated management contract while JET contracted with the company for only its' operations. This change in management structure and division of responsibilities necessitates a different approach for finding a way to implement a regional day pass today.

The most significant hurdle to the implementation of a regional day pass in 1999 was fare box technology. Incompatible fare boxes on JET and NORTA vehicles required the use of antiquated and

low-tech paper cards with removable stubs. Today, that is no longer an issue. While rebuilding their systems post Katrina, NORTA and JET made sure to use the same fare box technology. This decision would allow the use of the same fare media on both systems, greatly simplifying the implementation of a regional day pass.

Since 2005, NORTA has instituted a day pass for a $3 fare that allows unlimited travel in New Orleans. This day pass fulfills the needs of many riders and enjoys significant use. This corresponds with past experience with the previous regional day pass, which a majority of riders used to travel within Orleans Parish only (See table 1). Given the offering of this fare option for intra-parish travel in Orleans Parish, past trends are inadequate to predict how many riders would utilize a regional day pass option now.

However, a study by the Data Center shows that 41,425 Jefferson Parish residents commute to jobs in Orleans Parish while 62,704 Orleans Parish residents make the opposite commute into Jefferson Parish (Ortiz, Plyer, and Horowitz 2012). This represents 25% and 56% of working residents in Jefferson and Orleans Parish, respectively. Furthermore, 18% of Orleans Parish households and 8% of Jefferson Parish households do not have a motor vehicle available[1]. Further research would be needed to determine how many of the inter-parish commuters would benefit from a regional day pass, but existing commuting patterns and household characteristics suggest a that a regional day pass would be beneficial to many people.

3.1.8 Conclusion

The overall results of the New Orleans regional day pass were mixed. The pass helped riders that needed to travel between parishes, but because of the fare structure within each parish, this did not represent a majority of people who used the pass. The pass was most useful for people traveling within Orleans Parish and who were planning on making enough trips that paying separate fares was more expensive. Those riders now have the option of purchasing a $3 day pass for NORTA alone.

The coordination of farebox technology between JET and NORTA since 2005 has removed a major obstacle for regional fare integration. The lack of technological hurdles means that any future integration endeavors need not worry about capital expenses associated with the adoption of new fare media.

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[1] US Census Bureau, 2009-2013 5-Year American Community Survey, Table: B25044

3.2 US Case Studies

The case studies that this study features expand on those identified in the Transit Cooperative Research Program's Report 94: Fare Policies, Structures and Programs: Updated. At the time that TCRP Report 94 was published in 2003, extensive research and development efforts were underway in the metropolitan areas of San Francisco Bay, Washington, DC, New York City/Northern New Jersey, Los Angeles, Seattle/Central Puget Sound, San Diego, Miami, and southwestern Connecticut; however, researchers noted that their efforts were all in the early stages of implementation and testing. Because these regions took various approaches in fare integration, distinct and important lessons have likely since emerged that can provide guidance to other regions, including the New Orleans metropolitan area.

3.2.1 Phoenix, AZ

The Phoenix area's Valley Metro is a fully fare-integrated regional transit system utilizing the same charges and payment instruments for transit across all municipalities in Maricopa County. Under this agreement, the City of Phoenix, the City of Tempe, and the Valley Metro Regional Public Transit Authority (RPTA) are the primary managers and funders of transit operations. These entities subcontract with third-party private transit operators to perform the actual transit operations. Smaller municipalities are then able to purchase transit service on a per-revenue-mile basis through the City of Phoenix, the City of Tempe, and the RPTA using funds from a regional sales tax measure. The municipalities and their residents benefit from a fully regionalized system which charges the same fares and eliminates inter-agency transfers throughout the county-wide system (TTI 2012).

Valley Metro RPTA continues to utilize paper magnetic stripe passes for all fare payments. Riders must pay for a day pass (double the cost of the single-ride fare, if bought at a vending machine or transit center) in order to make any transfer, as transfer slips are not offered. However, this pass is then good for the rest of the rider's trips for the day. 15-day and 30-day passes are also offered.

History of Regional Cooperation

In the early 1990s, the primary provider of transit in Maricopa County was the Phoenix Transit System, which provided transit within the City of Phoenix and to some of the additional municipalities in the metro area. The City of Mesa and City of Scottsdale also operated their own transit systems. After the

passage of a one-half percent sales tax measure (Proposition 300) to fund freeway and mass transit expansion in 1985, a regional transit authority (the Regional Public Transit Authority, or RPTA) had been established but operated no transit services of its own (TTI 2012).

In 1993, municipalities throughout Maricopa County came together with the City of Phoenix and the RPTA to create Valley Metro, a regional transit brand funded through a cooperative regional agreement. The structure of the system, with larger municipalities acting as the direct transit managers and smaller cities and urbanized areas purchasing transit from these larger cities using Proposition 300 sales tax proceeds, was established at that time (TTI 2012).

The regional sales tax was renewed and increased by voters under Proposition 400 in 2004, and many individual municipalities have also passed local option sales taxes to support additional transit service for their residents. Currently, fourteen municipalities and urbanized areas participate in Valley Metro, as well as the RPTA, and six of these (Tempe, Phoenix, Glendale, Scottsdale, Mesa, and Peoria) have local option sales taxes in addition to the regional sales tax (TTI 2012).

Revenue Distribution

Revenues from transit operations are provided to the RPTA, the City of Phoenix, or the City of Tempe, based on which entity manages the service on each individual transit line. These managing entities are working to better consolidate service for greater efficiency and cost savings – in 2013, the City of Tempe and the RPTA combined their bus operations and gave a joint contract to First Transit to run the operations (Valley Metro 2013). Transfer rates and revenue distributions are determined by interagency agreement.

Much of the complexity of Phoenix's transit finance occurs in negotiations around levels of service for each particular municipality, based on the distribution of Proposition 400 sales tax that allows local jurisdictions to purchase service. Because some towns, cities, and urbanized areas receive more Proposition 400 funding and/or can support additional service based on local option sales taxes, it can be difficult to sustain the same level of service along an entire transit line. As a 2012 Texas Transportation Institute study noted, "when a route crosses multiple jurisdictions, one of the jurisdictions may only have funding to pay for 30-minute headways; whereas a neighboring jurisdiction along the route may want 15-minute headways. Entities pay for the desired level of service, but this leads to more trips taken along a certain leg…of a particular route. This leads to buses turning around at the end of particular jurisdictions" (TTI 2012).

Total ridership on the Valley Metro system as a whole in 2014 was 73,409,805. This included 59,123,712 trips by bus and 14,286,093 trips on light rail (Valley Metro n.d.).

Rider Advantages and Disadvantages

The advantages of a single regionalized system with a single fare structure are strong – riders can use a single fare payment mechanism and transfer freely between bus and light rail systems throughout the metro area. The main issue that riders may confront if traveling regionally is that some jurisdictions may provide lower levels of service based on their funding capacity; riders from these areas or who are traveling to these areas may have to deal with longer headways.

3.2.2 King County, WA

The "ORCA Card" is a coordinated fare system for three Seattle-area counties that is based on smart card technology. The ORCA smart card functions as a payment instrument on Sound Transit (which operates commuter rail, express buses, and light rail systems throughout the King, Snohomish, and Pierce County region) as well as King County Metro Transit, Community Transit, Everett Transit, Kitsap Transit, Pierce Transit, and the Washington State Ferries.

The ORCA Card works as an electronic purse, with differing fares between each agency simply deducted from the total funds that consumers load onto the card. "Monthly passes" are also available, but they essentially also function as an electronic purse system whereby riders estimate their total monthly transit costs and purchase a pass in an amount that corresponds to all the fares they will pay over the course of the month – any overages beyond this amount are charged in addition to the card. Therefore, monthly passes are more a matter of predictability for riders in knowing when to reload their card and how much value to add to the card; they do not offer discounts or necessarily last for the entire month.

All agencies that accept the ORCA Card have been able to keep their own fare structures, though two of the largest agencies (Sound Transit and King County Metro Transit) have worked to standardize their fare structures in order to create more predictability for riders. The maintenance of separate fare structures has allowed the smaller transit agencies that accept ORCA to keep their fares consistent with the different capital and operating needs of their transit systems.

History of Regional Cooperation

The ORCA Card was developed by Sound Transit in partnership with King County Metro Transit and launched in April 2009 (King County Metro Transit 2012). Sound Transit is a regional transit authority that was established in 1993 and funded by voter referendum in 1997 to implement recommendations in a regional transportation plan for King, Snohomish, and Pierce Counties (Sound Transit 2007). King County Metro Transit serves the greater Seattle area and is by far the largest of the transit systems in the Sound Transit regional service area.

The ORCA Card system replaced the old "Puget Pass" system, which was a "flash-pass" style system, meaning that riders had to physically display their passes to vehicle operators. Puget Passes were available in differing amounts based on each separate transit agency's fare requirements. Revenue from the Puget Pass system was distributed by estimating percentages of Puget Pass ridership on each system (TCRP 2003b). This system was always viewed as an initial step toward more effective regional fare coordination. Sound Transit administered the Puget Pass system with funding provided by the "fare integration budget" – a specific line item included in a voter referendum and millage that raised revenues for transit (Sound Transit 2007).

According to King County Metro's report on the ORCA rollout and promotion, switching to the new ORCA smart-card system from the former Puget Pass system offered advantages including "fast, easy fare payment and seamless regional travel [for] customers—and…benefits for transit agencies such as faster operations, more accurate ridership data, and improved revenue data and regional revenue reconciliation" (King County Metro Transit 2012).

Ongoing efforts to simplify regional fare systems have occurred since the ORCA smart-card implementation in 2009. These include restructuring of fare systems on Sound Transit and King County Metro to match fares for adult, youth, and reduced-fare riders on both systems' bus and rail operations ((King County Metro Transit 2012).

Revenue Distribution

Revenue from the ORCA Card is automatically distributed between transit agencies "in proportion to the total value of the transportation services used on each Agency during the pass validity period." (King County 2009). Therefore, if users receive transfers and other benefits, agencies will not receive their full fare; they will receive a distribution of the total ORCA expenditure by each particular user that accounts for the total cost of the services used on their transit system compared to the overall total cost of services.

The simplicity of the ORCA system, promotional efforts from the participating agencies, and wide availability of ORCA reloading stations has led to significant rider adoption of the ORCA card as a primary payment method. As of 2012, over 70% of daily riders (21+ trips per month) used ORCA to pay their fares on King County Metro, while 45% of infrequent riders (1-4 trips per month) used ORCA to pay their fares (King County Metro Transit 2012).

Rider Advantages and Disadvantages

A 2012 rider survey showed that 92% of Metro Transit riders agreed that they were satisfied with their "ease of fare payment" (King County Metro Transit 2013). One challenge in the early years of ORCA was scaling up the number of retail stores providing ORCA cards so that all could have access to card purchase and quick value reloading; reloading over the phone or online took 24-48 hours to process, while retail outlets could reload instantly (Sound Transit 2011). However, when the ORCA Card rolled out in 2009, only 10 retail outlets were available across the region. By the end of the card's second year of use in 2011, over 100 retail outlets were available (King County Metro Transit 2012). As of November 2014, the King County Metro Transit website lists over 120 retail outlets and customer service centers available to customers, as well as over 30 vending machines located at transit stations for purchase and reloading of cards (King County Metro Transit n.d.).

3.2.3 Ventura County, CA

"Go Ventura" is a regional coordinated fare system based on smart card technology. The same smart card works to pay fares across 5 agencies in the region: Camarillo Area Transit, Moorpark City Transit, Simi Valley Transit, South Coast Area Transit, Thousand Oaks Transit, and Ventura Intercity System Transit Authority (VISTA). Each agency has kept their own fare policies and structures, except for the adoption of coordinated policies on monthly-pass riders. The card functions as an "electronic purse" whereby the separate cost of each ride is deducted from the funds loaded onto the card by the owner, or it can hold a monthly pass that functions across multiple systems (TCRP 2003b).

History of Regional Cooperation

The Go Ventura service is managed by a central coordinating agency, the Ventura County Transportation Commission (VCTC). The VCTC began operations in 1989 and took on the regional transportation responsibilities of the Ventura Council of Governments at that time (Metrolink n.d.). Since then, the VCTC has worked to enhance mobility in the Ventura County area.

Regional payment coordination for the five regional transit agencies began in 1994 through a "flash-pass" system for monthly passes that allowed frequent riders to simply display their monthly passes to the transit operators when boarding transit vehicles; VCTC coordinated and implemented this initiative.

In 1996, VCTC volunteered to assist in testing a new smart-card system funded by a grant though the California Department of Transportation (CalTrans) that was intended to extend regional cooperation by providing a "seamless universal fare medium that could be used on all services in the County" (TCRP 2003a, p.166), as well as providing the participating transit agencies with additional data about regional transit usage patterns and the feasibility of creating a truly integrated payment system. This testing process resulted in the launch of the "Smart Passport," which involved the installation of smart-card technology across all participating agencies' transit vehicles. At the time, smart-card technology was relatively new, and technical problems hampered successful data collection. However, enough positive results were evident that the VCTC and its participating agencies chose to continue the regional smart-card program and update their technology to eliminate some of the problems from the original "Smart Passport" test (TCRP 2003a).

In 2002, the VCTC launched the "Go Ventura" smart-card system. In tandem with the launch of this updated system, the participating agencies pushed forward with greater transit operator, mechanic, and rider education around the smart cards in order to enhance rider usage and reduce operator or mechanical errors in using and maintaining the system. The Go Ventura system is still in operation today.

Revenue Distribution

Each agency participating in the Go Ventura system earns revenues from the smart cards based on the percentage of ridership occurring on each agency's vehicles. According to TCRP Research Results Digest 57, "periodic comparison between driver counts and system counts [of ridership] has noted virtually no discrepancies" (TCRP 2003b, p. 20) – meaning that the smart card method allows for a highly accurate means of distributing revenues to all participating agencies in a coordinated fare system. Other systems

that Ventura County had previously adopted did not offer the same degree of accuracy in revenue distribution and were therefore set aside in favor of the smart card method (TCRP 2003b)..

Usage

As of Ventura County's fiscal year 2011-12, the Go Ventura card was used on 434,819 trips; riders used 13,550 separate sales transactions to add value to or purchase Go Ventura smart cards (Ventury County Transportation Commission 2013).

Rider Advantages and Disadvantages

Currently, the system for acquiring and reloading GoVentura SmartCards is fairly cumbersome, likely due to the lower ridership and customer base in Ventura County – riders must either visit a transit center to reload their cards, or must call the VCTC with a credit card number and then wait up to five working days for their payments to process (Ventura County Transportation Commission n.d.). Incentives to use Go Ventura, however, are significant. Users receive a 10% discount on regular fares when using their SmartCard as a payment instrument. Monthly pass holders receive unlimited bus rides county-wide at a "significant discount" to paying regular bus fares on a daily basis.

4. Conclusions and Recommendations

This section identifies a series of guiding principles for regional fare integration based on the findings of the literature review as well as the four case studies, and presents recommendations for moving toward a regionally integrated transit for the New Orleans region.

4.1 Guiding Principles for Regional Fare Integration

Regional integration efforts are fairly new in the United States. Many regions in the country are implementing regional fare integration but most efforts have occurred in only the last 15 years. There are still many lessons to be learned and many new ways to structure integration efforts. Still, from the literature and case studies, the following guiding principles emerged:

- All organizations and individuals need to be committed to and invested in coordination, communication and cooperation to achieve success.

- An institutional champion as a lead stakeholder to provide necessary direction will assist the integration implementation process.

- Developing contingency plans to address unexpected exogenous events is essential.

- More participating organizations – transit agencies, regional planning orgs, etc. – means greater potential for improved customer benefits; however, additional benefits must be weighed against the increased complexity of institutional issues.

- Incremental and small steps are favored over the "do-everything-at-once-approach" (Miller 2005).

- Other transit agencies that have integrated services and fares should be approached to determine how effective their practices have been and to identify likely challenges.

- Revenue neutrality and costs are key concerns for many transit agencies introducing integrated fare payment. Lower revenue and new costs can be offset by decreases in other costs and mitigated through increased ridership.

4.2 Recommendations for New Orleans

Different regions will require different solutions for regional integration. Based on the literature review, case studies and stakeholder interviews we have developed the following recommendations for the New Orleans area:

- **The New Orleans Regional Planning Commission (RPC) to serve as the "project champion."** In 1999, when the regional day pass was first proposed, Sharon Leader of NORTA was the project champion. Today, the RPC is uniquely positioned to serve in that role. They can serve as a clearinghouse for all data collected from JET and NORTA, oversee cost-sharing and reimbursements, and utilize their role as the MPO to secure state and federal resources to advance the project.

- **Start small.** At the moment, there is no fare, infrastructure or schedule coordination between JET and NORTA. Rather than trying to do too much early on, the agencies should consider simply bringing back the regional day pass. The process of implementation will provide a strong foundation for future integration efforts.

- **Use existing technology**. In 1999, JET and NORTA utilized different and incompatible farebox technologies. The fare media for the regional day pass, therefore, had to be a simple card and stub system. Since 2005, both agencies have coordinated with each other to make sure they utilize the same farebox technology. This compatibility means the implementation of the regional day pass would require little to no capital expenses.

- **Consider coordinating the fare structures and prices for JET and NORTA**. In the short term, a regional day pass is a useful option. However, in the long term transit users will be better served by a coordinated fare structure across agency service areas. That means JET and NORTA would bring their fare structures and prices in line with each other. In the long term, a coordinated fare structure with equivalent pricing would make it easier to use simple transfer tickets between systems instead of needing a specific regional pass.

6. References

Bruen, Derrick. Interviewed by Vivek Shah & Alexandra Miller. In-person. New Orleans, LA: June 12, 2014

Eno Center for Transportation (Eno). (2014). Getting to the Route of it: The Role of Governance in Regional Transit. Transit Center. April 2014.

Jenks, Christopher. (2003). "Developing a Recommended Standard for Automated Fare Collection for Transit." Research Results Digest, Number 57. TCRP. February 2003.

Joslin, Ann. (2010). "Regional Fare Policy and Fare Allocation, Innovations in Fare Equiment and Data Collection." National Center for Transit Research. University of South Florida. March 2010.

King County Metro Transit. (No Date). "Fares & ORCA: Where to Buy."
http://metro.kingcounty.gov/fares/where-to-buy.html. Accessed November 2014.

King County (2009). "Amended and Restated Interlocal Cooperation Agreement for Design, Implementation, Operations and Maintenance of the Regional Fare Coordination System." April 14, 2009. http://crosscut.com/media/static_file/2013/02/12/ILA_PDF.pdf. Accessed November 2014.

King County Metro Transit. April 2012. "Increasing Access to ORCA Regional Fare Media." http://metro.kingcounty.gov/am/reports/2012/orca/Metro_ORCA_Access_04-12_.pdf

King County Metro Transit (2013). "2012 Rider Survey Report." http://metro.kingcounty.gov/am/reports/2012/2012-rider-survey.pdf. Accessed November 2014.

Leader, Sharon. Interviewed by Vivek Shah. In-person. New Orleans, LA: June 5, 2014

Metrolink. (No Date). "Member Agencies." http://www.metrolinktrains.com/agency/page/title/member_agencies.

Miller, Mark, et al. (2005). Transit Service Integration Practices: An Assessment of US Experiences. California Partners for Advanced Transit and Highways. UC Berkeley. March 2005.

Moncada, Gloria. Interviewed by Vivek Shah. In-person. New Orleans, LA: June 6, 2014

Ortiz, Elaine, Allison Plyer, Ben Horwitz. (2012). Economic Ties Across Southeast Louisiana: Preliminary findings from commuter data. The Data Center. New Orleans, LA. April 2012.

Roesel, Jeff and Jason Sappington. Interviewed by Vivek Shah & Alexandra Miller. In-person. New Orleans, LA: May 30, 2014

Sound Transit. (2007). "Sound Transit History and Chronology."

> http://www.soundtransit.org/Documents/pdf/about/Chronology.pdf

Sound Transit. (April 21, 2011). "QFC stores join list of nearly 100 ORCA retail outlets, making travel

> easier." http://www.soundtransit.org/About-Sound-Transit/News-and-events/News-
> releases/News-release-archive/QFC-stores-joins-list-of-ORCA-retailers

Texas Transportation Institute (TTI). (2012). "Valley Metro." http://tti.tamu.edu/group/transit-

> mobility/files/2012/10/Valley-Metro_10-26-12.pdf. Accessed November 2014.

Transit Cooperative Research Program (TCRP). (2003a). *TCRP Report 94: Fare Policies, Structures and*

> *Technologies: Update.* Transportation Research Board: Washington, D.C.

Transit Cooperative Research Program (TCRP). (2003b). *Research Results Digest 57: Developing a*

> *Recommended Standard for Automated Fare Collection for Transit: Scoping Study—Regional*
> *Fare Management Programs*. Transportation Research Board: Washington, D.C. February 2003.

Valley Metro. (No Date). "Ridership Reports."

> http://www.valleymetro.org/publications_reports/ridership_reports. Accessed November 2014.

Valley Metro. (January 24, 2013). "Approval of Bus Contract Unifies Bus Service Operations."

> http://www.valleymetro.org/pressreleases/detail/approval_of_bus_contract_unifies_bus_servic
> e_operations. Accessed November 2014.

Ventura County Transportation Commission. (No Date). "Go Ventura Bus Pass."

> http://www.goventura.org/?q=travel-ventura/vista/go-ventura-bus-pass

Ventura County Transportation Commission. (2013). "Fiscal Year 2013/14 Budget."

> http://www.goventura.org/sites/default/files/VCTC_Budge-FY2013-2014.pdf