Exploring The Challenges of New Transportation Proposals and Recommendations for Future Transportation Proposals for The City of San Jose

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Table of Contents

Proposal of study

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Purpose of the study: The study is focused on investigating the challenges and opportunities relating to the City of San Jose's requests for new transportation solutions. Specifically, I will focus on the City of San Jose's recent Automated Transportation Network (ATN) request for information (RFI) with ARUP and Aerospace within the Mineta San Jose International Airport area. By identifying the challenges and opportunities, this study can provide useful solutions for new transportation developers to approach cities and municipalities.

Objectives: Upon completion of this study, I will have:

- Understood different policy challenges for implementing new transportation solutions
- Gain a better understanding of the City of San Jose's policies and framework for new transportation projects
- Acquired knowledge of ATNs
- Experienced working with different disciplines (engineers, policy-makers, planners)
- Gathered and analyzed data
- Produced and presented a professional research report

Activities to accomplish objectives: To accomplish these objectives, I will research recent transportation initiatives and projects pitched to the City of San Jose and other USA Cities. Research will include reading documents and reports from ARUP, International Institute of Sustainable Transportation (INIST), and other resource. Finally, I will explore alternative solutions to the current RFI process that current transportation system developers (such as the developers for ATN), City of San Jose, and other cities may use when considering new transportation system proposals.

Number of units: 2 units.

Abstract

The City of San Jose, Arup, Aerospace Corporation, San Jose State University, and other stakeholders spent a considerable amount of time, energy, and resources in proposing the Automated Transportation Network (ATN) project for the Mineta San Jose International Airport. In 2012, a feasibility study was conducted for the City of San Jose. After reviewing the feasibility study, the City of San Jose concluded that the project was not feasible, and that more research needed to be done and more information needed to be gathered to have a more comprehensive understanding of the capabilities and flaws of the ATN design.

However, this does not rule out that the possibility of a future ATN project for the City of San Jose. In fact, the City of San Jose is generally supportive of implementing the airport ATN project. This paper will delve into the various challenges that the ATN proposal encountered, as well as provide an overview of other common challenges that transportation projects face. This paper will use case studies to demonstrate other challenges and successes of their processes. Finally, the paper will present recommendations for the next steps of the ATN project and for the City of San Jose. By identifying the challenges and opportunities, this study can provide useful solutions not only for the ATN project, but for other transportation developers to approach cities and municipalities for new proposals, as well.

Chapter 1: Introduction

Representing one of the biggest populations in the United States, and the biggest in the Bay Area, the City of San Jose boasts another impressive number – an average total commute time (inbound plus outbound) of about 52 minutes, with 15.6% of reported inbound commutes at 45 minutes or longer.[1] These numbers are not surprising – any resident or employee in San Jose can vouch for the extreme traffic congestion that plagues the Bay Area. With that being said, the City of San Jose is continually looking to reduce traffic congestion and pursue alternative modes of transportation, particularly sustainable transportation networks.

In an effort to create a sustainable, cutting-edge, and customer-service oriented transit system, the City of San Jose hired Arup (an engineering consulting firm) and Aerospace Corporation (a systems engineering firm) to help determine the feasibility of installing a personal rapid transit (PRT) system at San Jose's Mineta International Airport. The San Jose Airport was chosen in an effort to produce a system that would provide

[1] Bryce Druzin, Greg Baumann, and Chris Walker, "Mapping the Bay Area's Best and Worst Cities for Commuters," *Silicon Valley Business Journal*, March 3, 2014, http://www.bizjournals.com/sanjose/news/2014/03/03/silicon-valleys-best-and-worst-commutes.html(accessed November 10, 2014).

enhanced connections between the terminals and surrounding regional transit agencies.[2] The study focused on the feasibility of an Automated Transit Network (ATN), which are fully automated vehicles operated on a separated guide way. ATNs are unique compared to other traditional mass transportation systems (such as buses, trains, and light rail systems) because rather than stopping at stations along a fixed route, ATNs travel from destination-to-destination based on the passengers' needs. This allows ATNs to skip stations and to run without a fixed schedule. Thus, ATNs have the potential to get passengers to their destinations much quicker and more efficiently than their traditional counterparts, while also providing a more customized service for their customers.[3] ATNs are truly focused on the system vehicles, with a specific focus on the passenger loads.[4] Additionally, because ATNs will not run on the same roads as cars, a successful ATN network can take drivers off the road and make for less congested streets.

After reviewing the ATN feasibility study, the City of San Jose concluded that there are still several key issues to resolve before implementing the project.[5] This paper attempts to uncover some of the challenges faced in undertaking new transportation projects, and recommendations for future proposals.

The target audience for this report is the City of San Jose and the stakeholders involved in the ATN project. The information in this report will also be relevant for other cities that are looking to implement a similar transportation system to ATNs or PRTs. This report may also be useful for cities that are looking to implement similar sustainable projects in general.

Chapter 2: Why is ATN not technically feasible for the City of San Jose?

The 2012 memorandum in response to the ATN Feasibility study from Hans Larsen, Director of Transportation from the City of San Jose, cited several reasons for why the ATN project was not feasible. Some of the key findings include:

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[2] Arup, "San Jose Automated Transit Network," http://www.arup.com/Projects/San_Jose_ATN/Details.aspx (accessed September 18, 2014).
[3] Department of Transportation, "Automated Transit Network (Atn)," City of San Jose, http://www.sanjoseca.gov/index.aspx?NID=3706 (accessed November 15, 2014).
[4] Burford Furman et al., "Automated Transit Networks (Atn): A Review of the State of the Industry and Prospects for the Future" (San Jose: Mineta Transportation Institute, 2014), http://transweb.sjsu.edu/PDFs/research/1227-automated-transit-networks.pdf (accessed September 24, 2014).
[5] Director of Transportation, *Memorandum*, San Jose, CA, October 17, 2012, http://www.sanjoseca.gov/DocumentCenter/View/14332 (accessed December 3, 2014).

Capacity and throughput. Understanding the limits of the passenger-carrying and station capacity of ATNs is still not yet widely known. This unknown, the memo states, may be jeopardizing during high peak traffic periods at the airport.[6]

Regulatory issues. The memo notes "The regulatory effort that would be associated with qualifying ATNs for use within the State is difficult to estimate and predict".[7] Because ATNs are still a relatively new technology, the City suggests that a new regulatory framework for ATN would have to be adopted. The City notes that the California Public Utilities Commission (CPUC) would have the regulatory authority over an ATN in San Jose.[8]

Estimated costs. Again, because the framework and process for implementing ATNs is not standardized, the estimated costs in the feasibility study are very approximate.[9]

These findings will be useful to compare and contrast with challenges that other projects face, and will be used to create recommendations at the end of this paper.

Chapter 3: Case studies of other cities' transportation project proposals

This section will detail three case studies of transportation projects. The process and lessons learned from each study will provide useful insight into recommendations for the City of San Jose.

California High-Speed rail

In 2008, California voters approved a $9.95 billion bond to go towards the design and implementation of a California High-Speed Rail (HSR) system. The system is the first of its kind for California, spanning 800 miles of high-speed rail from Los Angeles to San Francisco, promising a total trip time of an unheard of two hours and forty minutes. Voters were supportive of the project for a variety of reasons, including: the system's perceived ability to ease congestion, reduce air pollution, create new jobs, and offer an affordable and quick cross-state transportation option without having to step foot into an airport.[10]

However, many things have changed since the bond was approved in 2008. As of 2012, cost estimates have grown from $43 billion to over $100 million. The completion

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[6] Director of Transportation, *Memorandum*, San Jose, CA, October 17, 2012, http://www.sanjoseca.gov/DocumentCenter/View/14332 (accessed December 3, 2014).
[7] Director of Transportation, *Memorandum*, San Jose, CA, October 17, 2012, http://www.sanjoseca.gov/DocumentCenter/View/14332 (accessed December 3, 2014).
[8] Director of Transportation, *Memorandum*, San Jose, CA, October 17, 2012, http://www.sanjoseca.gov/DocumentCenter/View/14332 (accessed December 3, 2014).
[9] Director of Transportation, *Memorandum*, San Jose, CA, October 17, 2012, http://www.sanjoseca.gov/DocumentCenter/View/14332 (accessed December 3, 2014).
[10] California High-Speed Rail Authority, "California High Speed Rail," http://www.hsr.ca.gov/ (accessed December 4, 2014).

date has been pushed back thirteen years, and upper management has changed hands numerous times. State auditor reports note that the majority of funding comes from the federal government, which is not always secure. Additionally, a recent poll shows that if Californians were to vote on the 2008 bond again, 59% would vote against it.[11] The once-favorable outlook on the high-speed rail system has become largely unfavorable in a timespan of only five years.

Although the California High-Speed Rail is not a failed project, there are lessons to be learned from the project thus far. The California High-Speed Rail Authority's (HSRA, responsible for the planning, designing, and building of the HSR) improper forecasting of the costs and project timeline calls for more rigorous reporting and transparency.

However, there are also things to learn from the early success and public approval of California's HSR. The HSRA and other HSR advocates and stakeholders successfully outreached and marketed the proposition, with 52.7% voting in favor.[12] Garnering widespread support from major stakeholders in California was key in getting more supportive voters to the polls. Other critical factors leading to the approval of the HSR project was long-time support from Californian politicians (namely, Governor Jerry Brown), and a well-timed proposal that could seemingly lift California out of its economic recession.

The Oakland Airport Connector (OAC): Coliseum-Oakland International Airport Line

On November 22, 2014, the Bay Area Rapid Transit's (BART) Automated Guideway Transit System (AGT) opened for public service. The system is operated by BART and carries passengers between BART's Coliseum Station in Oakland and the Oakland International Airport (a 3.2 mile stretch on an elevated guide way right-of-way).[13] The project was proposed to replace the former AirBART shuttle bus as a means to reduce average travel and wait time, increase passenger capacity, and provide a seamless, reliable, and frequent connection between its BART and the Oakland International Airport.[14]

There is a combination of factors leading to this project's success. That the OAC was replacing a less capable AirBART shuttle meant that there was already a need for an improved system. Additionally,

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[11] Ryan Holeywell and Daniel Lippman, "The 5 Biggest U.S. Infrastructure Projects, Plus 5 at Risk," Governing (April 2012), http://www.governing.com/topics/transportation-infrastructure/gov-5-biggest-us-infrastructure-projects-plus-5-at-risk.html (accessed December 4, 2014).
[12] California Secretary of State Debra Bowen, "Statement of Vote November 4, 2008, General Election," https://www.sos.ca.gov/elections/sov/2008-general/sov_complete.pdf (accessed December 5, 2014).
[13] Railway Technology, "Oakland Airport Connector, United States of America," http://www.railway-technology.com/projects/oaklandairportconnec/ (accessed December 5, 2014).
[14] Alameda Country Transportation Commission, "BART Oakland Airport Connector," Capital Projects Program Project Fact Sheet, http://www.alamedactc.org/files/managed/Document/4642/ACTIA6030_BARTOaklandAirportConnector_factsheet.pdf (accessed December 5, 2014).

that BART was able to secure funding from multiple local, regional, state, and federal sources was a big win for the project.[15]

However, the project did not go without any bumps in the road. In 2009, the project lost $70 million in federal funds because the Federal Transit Administration (FTA) found BART out of conformance with Title VI. Ultimately, BART's analysis of the Oakland Airport Connector project had significant equity concerns because it lacked information on how the project would affect low-income residents and minorities.[16] Because lower income populations make up a large percentage of transit users, especially in the Bay Area, addressing equity is central to a successful transportation project.

Morgantown Personal Rapid Transit (WVU PRT)

The Morgantown Personal Rapid Transit (WVU PRT) is the first large scale Automated Guideway Transit (AGT) system in the United States.[17] Built in the 1970s in Morgantown, West Virginia, the system was designed to move both students around West Virginia University (WVU) and community members of Morgantown.[18,19] The need for a more efficient transport system arose as many mass transportation projects do – because of debilitating traffic congestion. Morgantown's population of 20,000 people and the University's population of another 20,000 people caused especially heavy congestion throughout the downtown area, where all major bus lines traveled through.[20]

The initial proposal for the PRT system began with Professor Samy Elias, head of the industrial engineering department at WVU. With overwhelming support from the University, the City of Morgantown, and the West Virginia Congressional Delegation, Elias secured $50,000 from the Urban Mass Transportation Administration (UTMA, now known as the Federal Transit Administration, the United States Department of Transportation agency that provides financial assistance to public transportation projects).[21] This

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[15] Geoffrey D. Gosling et al., *Case Study Report: Oakland International Airport BART Connector* (San Jose: Mineta Transportation Institute, May 2012), http://transweb.sjsu.edu/PDFs/research/2503/2503_cases/2503-cs3-oak-airport-connector.pdf (accessed December 5, 2014).
[16] Ayako Mie, "$70 million for airport connector project to be diverted to regional transit agencies," Oakland North (February 21, 2010), https://oaklandnorth.net/2010/02/21/70-million-for-airport-connector-project-to-be-diverted-to-regional-transit-agencies/ (accessed December 5, 2014).
[17] West Virginia University, "Personal Rapid Transit (PRT)," Transportation and Parking, http://transportation.wvu.edu/prt (accessed November 24, 2014).
[18] Steve Raney and Stanley E. Young, "Morgantown People Mover – Updated Description," Transportation Research Board Annual Meeting (November 15, 2004), http://www.cities21.org/morgantown_TRB_111504.pdf (accessed November 25, 2014).
[19] West Virginia University, "Personal Rapid Transit (PRT)," Transportation and Parking, http://transportation.wvu.edu/prt (accessed November 24, 2014).
[20] J. Edward Anderson, "Some Lessons from the History of Personal Rapid Transit (Prt)" (paper presented at the PRT and Other Emerging Transit Systems Conference, Minneapolis, MN, November 1996), http://faculty.washington.edu/jbs/itrans/history.htm (accessed December 10, 2014).
[21] J. Edward Anderson, "Some Lessons from the History of Personal Rapid Transit (Prt)" (paper presented at the PRT and Other Emerging Transit Systems Conference, Minneapolis, MN, November 1996), http://faculty.washington.edu/jbs/itrans/history.htm (accessed December 10, 2014).

combination of stakeholders played a major role in the success of the project implementation.

The follow-up implementation of the WVU PRT was not easy. Political pressure from the State of West Virginia to complete the project quickly, combined with out-of-state contractors that were mostly unfamiliar with PRTs presented a whole host of problems. These challenges resulted in an increase in construction and operations costs and, unfortunately, a generally unfavorable outlook on the PRT planning system.

However, the WVU PRT still represents a successful major federal initiative to address public transportation needs with a new type of transportation system. The system has now been running for nearly 40 years (since 1976), with an average of 15,000 riders per day.[22] Like other transit projects, and in particular for other PRT and ATN projects, there were many lessons to be learned from this project, such as the importance of having strong political leadership and regulatory framework to better guide the process.

Chapter 4: Conclusions and Recommendations

The City of San Jose's decision to pursue further information on ATN presents a good opportunity to reevaluate and reapproach the feasibility study and proposal. There are many other cities that have successfully adopted similar transportation projects that the City of San Jose can use as a guide or reference. Based on this paper, some of the common factors that seem to have resulted in the successful projects are:

Providing a service that was needed. Both the Oakland Airport Connector and the WVU PRT replaced defunct and inefficient transport systems that were in dire need of upgrades. Likewise, the CA HSR is providing a new service that people did not yet realize that they needed, but expects to be especially useful in moving people to job centers and effectively "shrinking" the state of California.

Good timing. Voters approved the CA HSR bond in 2008, at one of the lowest points of the nation's recession. The CA HSRA marketed the HSR project well, promising that the project would create jobs and boost the economy. With such a high number of unemployed Californians, the HSR seemed a promising transportation effort that would not only alleviate traffic but also improve the struggling economy.

Providing a solution appropriate to the community's needs and vision. Identifying and implementing a service that fits a community's needs sounds like common sense, but can be hard to achieve. CA HSRA did a good job in understanding the travel demands of Californians and proposing a south-north network that targets major work and travel destinations. Likewise, the Oakland Airport Connector developers understood that riders

[22] Steve Raney and Stanley E. Young, "Morgantown People Mover – Updated Description," Transportation Research Board Annual Meeting (November 15, 2004), http://www.cities21.org/morgantown_TRB_111504.pdf (accessed November 25, 2014).

needed a more seamless connection between BART and the airport, to allow for a more comfortable and convenient trip. And the WVU PRT project specifically targeted the major users in its city – the University community and its residents.

Likewise, there are several factors that could have been improved during each of the processes, including:

Paying attention to all stakeholders. The Oakland Airport Connector project lost $70 million in federal funding for not providing the necessary analysis on how the project would affect minorities and those with lower incomes. Project developers need to consider all stakeholders and groups, paying particular attention to those voices that may be less vocal.

Providing a regulatory framework to lead the project. Despite still being in use, the WVU PRT lacks a regulatory framework, which makes it difficult for other cities to appropriately model its system.

Lack of transparency. When doing major public projects, transparency and clarity is key. The HSRA still struggles with transparency of total project costs and its timeline, which has reflected in the overall perception of the project. Likewise, the Oakland Airport Connector project might not have suffered a financial loss if their analysis was more transparent.

The City of San Jose's decision does not indicate that ATN is not feasible for the San Jose International Airport or the City as a whole. The City should continue to pursue the project because of its multiple potential benefits as a sustainable mode of transportation. By taking into consideration the reasons that the City of San Jose found the ATN project not feasible and the case studies in this report, recommendations include:

Attempt to incorporate as many stakeholders as possible. This includes widespread outreach to all potential users of the system, developers, cities, businesses, community members, advocates, and others involved. A project with strong public approval from a variety of different networks carries well with decision makers and its community.

Create a regulatory process that supports the construction of an ATN system. A conversation needs to start between ATN developers and the CPUC. By doing this, a more accurate estimate of cost and operations can be assessed.

Finding the right timing. Understand that a project can be successful in one year, but less successful in the following year. Project developers should take into account these fluctuations to determine whether or not the City is ready to pursue a new mass transportation project

Continue to make the case that sustainable transportation projects like ATN will be the backbone of a city and region's transportation networks. With California Environmental Quality Act (CEQA) guidelines beginning to slowly phase out Level of Service (LOS: impacts on automobile traffic congestion) as a measure of environmental

impact, it will become much easier for sustainable transportation projects like ATN to succeed. With Vehicle Miles Traveled (VMT) now emerging as the new measurement of transportation impacts on the environment, ATN developers should emphasize the reduction of VMT from using an ATN system.

Understand the community to make the case that the costs of ATN are worth it in the long run. The upfront costs of an ATN system may seem daunting. Especially when the system has less capacity than a traditional bus, light rail, or train system, it is hard to convince a city to take on this type of project. However, there are other benefits that ATNs have over traditional transit, such as the ability to fit in well into an urban environment, flexibility in design, and the ability to provide an efficient transit solution this is customized to the user's experience. By highlighting these strengths, ATN developers have a better chance at proposing this type of development. Additionally, it is important that developers and planners understand their city and its community members. By understanding the city's needs, the ATN proposal can be crafted to fit the community's needs well.

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