The Return of Streetcars to Western American Cities:
Reintroducing Streetcars in Denver's Historic Streetcar Neighborhoods

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Submitted to the Department of Urban Studies and Planning
in partial fulfillment of the requirements for the degree of

Master in City Planning
and an Urban Design Certificate
at the
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
June 2009
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ABSTRACT

Modern streetcars are making a comeback in the United States after their disappearance in the mid twentieth century. They resemble their distant relative, also known as the trolley, in many ways but express a contemporary, provide modern conveniences, and act as a magnet for redevelopment within the city. Modern streetcars build on the theory behind the European tram systems and provide desirable transportation options to support a range of densities in urban living.

Currently in the United States, Portland, OR and Seattle, WA operate one modern streetcar line and have plans to expand their singular line into a network. Using these two routes, the plans for system expansion, and the individual cities that support them as case studies, this thesis analyzes the potential for streetcars to return to Denver, CO. The analysis for the Mile High City was conducted using my knowledge of and research on Denver and the surrounding metropolitan region, its historical skeleton that developed around the streetcar, and the City's current trends in public transportation and planning processes. Based on a multifaceted analysis that includes studying the relationship of potential streetcar route length, multi-modal connections, major destinations, high bus ridership routes, projected residential density, projected employment density, and redevelopment potential based on use and zoning, Denver is in fact an appropriate city for the return of streetcars. Not only would one streetcar be successful, but an integrated system could serve the City and its surrounding urban neighborhoods well.

Taking the analysis one step further, the research attempts to compare a potential modern streetcar system for Denver with the historic streetcar routes that operated until 1949. Many observations arise, including the obvious difference in the limited number of modern lines versus the vast number of historic routes. Modern streetcars typically occur on primarily mixed-use corridors rather than pass through strictly residential neighborhoods as they once did. It is also evident that modern streetcars in Denver would direct redevelopment within the city whereas historic streetcars directed development to the edge of the city. This ability to direct development and redevelopment within the city's boundaries in addition to providing transportation fit in line with Denver's goals for growth management, multi-modal transportation options, and neighborhood revitalization.
ACKNOWLEDGEMENTS

Thank you to all my interviewees who took the time to discuss my research with me. Your insight was integral to my proposal and gives me hope that streetcars will return to Denver in my lifetime.

I would like to acknowledge my many classmates who supported and challenged me through this process and showed genuine interest in my thesis topic; I hope I was as supportive in return. Thank you to Kathleen Zeigenfuss for ogling European trams with me last summer while generating potential thesis topics. Thank you to my good friend, Emily Kreisa, for traveling to Portland, OR with me to ride their streetcar and for being a sounding board throughout the course of my research.

I extend my extreme gratitude to Professor Sam Bass Warner for your wonderful direction, patience and understanding during this hectic semester. And to Professor John de Monchaux, thank you for your sage advice, thesis-related and beyond. It has been a pleasure and an honor to work with you both.

Lastly, thank you to my family for your support and understanding during this semester and throughout my entire college career. I am where I am today thanks to you. Eric, thank you for your patience, support and understanding, especially throughout the last two years. We made it!
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After riding the trams, both old and new, in places like Bratislava, Budapest, and Vienna, I began to wonder why the United States does not have tram networks similar to those in Europe. They are iconic, create a continuous hub of activity along a corridor, are easy to understand as a tourist, provide an easy way to access all parts of the city as a resident or commuter, and are accessible to the young and the old. After a brief search into America’s experimentation with the tram, I came across the modern-day streetcar in Portland, OR and Seattle, WA. One in the same, the European tram and the modern American streetcar share many of the above characteristics.

As a former and hopeful future resident of Denver, I am interested in bringing the best urban design ideas home with me upon graduation. For this reason, I decided to look into the possibility of modern streetcars in the Mile High City after they caught my attention in Europe. I was also interested in the possible connection of a new modern streetcar with the historic streetcar routes and the neighborhoods that developed around them. This thesis is a result of those interests and seeks to determine the potential for modern streetcars or trams to return to Denver’s historic streetcar suburbs. It then attempts to compare that potential to the original streetcar routes that traversed the city.

The use of the word “return” is possibly misleading, but reinforces the idea that the central Denver neighborhoods were built on a network of streetcars that operated for over 70 years. The modern streetcar is the same family, but multiple generations ahead. Like its elder relative, the modern tram could provide many of the same benefits to Denver today, including transportation and development guidance. Unlike its predecessor, the modern tram in the United States does not guide new development to the edge of town but rather redirects it within the city. It can catalyze brownfield sites...
and give new definition to existing neighborhoods. Modern streetcars may not be for every city in America, but as this research proves, their prospect in Denver is positive and could rely upon the same neighborhoods that were built by streetcars only a century ago.
CHAPTER OVERVIEW AND METHODOLOGY

This research begins with a definition of what the modern-day streetcar is, and equally as important, what it is not. It continues into the second and third chapters with two case studies from cities with existing tram routes in the United States: Portland, OR and Seattle, WA. While there are other streetcar systems in the United States, they are either true historic trolleys or replicas of historic trolleys and do not fully embrace the benefits of the more modern vehicles. Although they share many of the same characteristics, I chose to focus on modern streetcars because they seem to take a solid original idea (local rail transportation) and put a contemporary spin on it rather than rely on historic nostalgia. The fourth chapter is a look into Denver’s streetcar history as well as the current state of public transit in the Denver metropolitan region. Lastly, the fifth chapter is an analysis and comparison of the research as a whole. It suggests where a streetcar network in Denver would be most successful, given the case studies and state of affairs in Denver; using a series of graphic analyses. It then compares those suggested routes with the historic streetcar routes and neighborhoods.
Before delving into the benefits and criticisms of streetcars in modern American cities, it is necessary to define what a streetcar is, and perhaps more importantly, what it is not. Many know the European version of streetcars, typically called trams. Some can recall a time when most cities in America had expansive streetcar systems. Some cities operate historic replicas of streetcars, known as vintage trolleys, and still others operate vintage trolleys, original historic vehicles. This research focuses solely on modern American streetcars, consisting of new track systems and new vehicles. There are distinct differences between the streetcar and other modes of urban mass transit.
transportation. For ease of discussion, the characteristics of urban streetcars can be arranged into seven categories, including 1) purpose and benefits, 2) planning, 3) cost, 4) service, 5) vehicles, 6) infrastructure, and 7) urban interaction. These categories allow for a comparison with other modes of transit, namely local bus service, bus rapid transit (BRT) and light rail.¹

Streetcars serve many purposes and provide multiple benefits to a city, its residents, and its workforce. They serve as an urban circulator, make connections to a larger transit system, provide easily comprehensible tourist mobility, create a sense of place, help cities meet their sustainability goals, and guide and attract economic development. Knowing this now, it is hard not to question why cities decided to tear up their old streetcar lines.

As a local circulator, a streetcar route provides access throughout and between particular neighborhoods or districts in a city. They often link important destinations, such as hospitals, nodes of employment or dense neighborhood districts. In Portland, for example, the first streetcar route linked a hospital, a university, and multiple mixed-use developments. Local circulators serve as the “last mile” connection – connecting transit nodes such as light rail stations with neighborhoods, employment centers, and the like. They reinforce the ability to move between areas of the city without the need for a car, and thus can reduce pressure on automobile infrastructure, including parking demand. A streetcar route or system can also play a major role in a “park once” transportation solution. In a park once scenario, automobile users arrive at a general destination, then use the streetcar to travel between specific destinations throughout the day. Parking once and using public transportation can reduce automobile demand in the city center.

¹ A summary of this comparison can be seen in the appendix.
During the weekday and on weekends. By using local connector routes that people enjoy riding, such as streetcars, cities can increase their overall ridership and reduce parking at regional transportation hubs.

Another function of a streetcar route is to connect to a larger transit system. This increases mobility and access, but also can help to increase total system ridership. If people are willing to ride streetcars, they might be more willing to try connecting to other modes of transit as well. The more connections to other transportation modes a streetcar route can make, the better. In Seattle, for example, the existing South Lake Union Streetcar route connects to the city’s major transit hub, which includes light rail and bus service. In Portland, the streetcar route connects to light rail, bus routes, and an aerial tram. David Taylor, a consultant on rail projects with HDR, Inc. notes that streetcar systems “serve as an overall transit system enhancer; expanding the reach of regional rail systems into neighborhoods.”

Both Toronto and Tacoma, WA have seen ridership levels increase when a bus route is converted to a streetcar route. Toronto saw a 15 percent ridership increase, and Tacoma saw an amazing 500 percent increase. Increasing overall system ridership also includes persuading people to ride transit that would normally not, or that have a choice to drive. Memphis, TN estimates that over 80 percent of those riding the streetcar are not frequent users of other forms of public transit (i.e. the bus). Access to a city’s rail transit system is seen as a much-desired

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2 Interview with Patrick Sweeney, Portland Department of Transportation, Telephone Interview, March 13 2009.
4 “Seattle Streetcar Network and Feasibility Analysis,” (Seattle: Department of Transportation with Parksons Brinckerhoff, 2004), p. 6
amenity throughout the country, and streetcars can provide a neighborhood-scaled
connection to that larger network.

Using streetcars to increase overall system ridership can help to attract a wide range of
riders, including local residents, employees, and tourists. When in a new city, rail trans-
portation is easy for tourists to decipher. The rails are visible in the street, advertising
that some transit vehicle passes by and carries passengers. Additionally, urban rail maps
are typically easy to understand, and major destinations are clearly marked. Riders that
may not be accustomed to riding transit can have “confidence in exactly where they
are going.” Compared to bus routes, which are rarely used by tourists to access the
city, rail transportation provides tourists and residents greater accessibility without
needing a car. In certain scenarios, the streetcar itself is the tourist attraction, known
to some in the trade as “transportainment.” However, successful streetcars routes are
those that connect to more than just a single-event or a single destination.

A neighborhood or district with a streetcar route often has a much more defined
sense of place than one without. Some go so far as to say that “bringing back the
streetcars puts back the flavor our cities and towns have lost.” People can understand
the neighborhood and its place in the city through a streetcar. Kevin Lynch refers to
this sense of place as

Farbstein Shibley, Emily Axelrod, and Richard Wener (Rudy Bruner Foundation, 2005). p. 10
6 William S. Lind and Paul M. Weyrich, “Bring Back the Streetcars!” (The Free Congress Research and
Education Foundation, 2002). p. 12
the clarity with which it can be perceived and identified, and the ease with which its elements can be linked with other events and places in a coherent mental representation of time and space and that representation can be connected with non-spatial concepts and values.

He continues to discuss the identity of a place as “the extent to which a person can recognize or recall a place as being distinct from other places—as having a vivid, or unique, or at least a particular, character of its own.” By linking different neighborhoods along a streetcar route, the passenger is aware of transitions from one place to another. Also, the streetcar becomes a desired and defining amenity for properties surrounding the line. For example, a business can market the fact that they are “right on the streetcar line” and a residence has a great location if it is “only two blocks from the streetcar.” Streetcars also help to bridge the gap between a very dense urban place, and a medium-density place, and can even help to transition to a more dense suburb. People will always desire a range of built forms, from urban to suburban, but “even when people live in suburbs, they want a physical ‘center’ to their lives that offers more than a shopping center can.” It is possible to use streetcars to help define that physical center and generate much desired pedestrian activity.

Another benefit of streetcars is to act as a development guide and generator in cities. Economic development, which leads to job creation, neighborhood rejuvenation, and further investment, is the goal of any city. A streetcar route can provide a tool to direct that development into areas that can absorb it and benefit from it the most. Gloria

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8 Weyrich, “Bring Back the Streetcars!” p. 10
Ohland, with Reconnecting America and editor of *Street Smart: Streetcars and Cities in the Twenty First Century*, has said that streetcars are “economic development projects with transportation benefits.” It is certainly true that the two goals work in tandem to produce walkable, desirable urban places. As a development guide, streetcars can have major effects on a city’s future land uses. Whereas BRT, light rail, and commuter rail typically create transit nodes (due to the greater distance between stations), streetcars create a more consistent linear form of development. The “‘ribbon’ of density that follows the streetcar corridor” is in contrast with the “dense nodal, ‘wedding cake’ pattern of development that occurs in the half-mile radius around” more regional transit modes. This is not to say that one is better than the other, but that the two create different land use scenarios and can work in tandem in urban places. By both attracting development and helping to guide it in a linear fashion, streetcars work with multiple city agencies and private developers to accomplish the similar goal of providing a mixture of uses around transit choices.

Streetcars in cities also provide sustainability and “green” benefits. Although these benefits have been discussed previously, it is important to highlight them here as ways that cities can achieve certain sustainability goals. The first sustainable benefit is reducing overall car trips in the downtown area. For example, Portland’s regional government—Metro—reports that neighborhoods that exhibit both good transit service and mixed-use development show a much lower share of auto use: 58.1 percent of trips by auto as opposed to 87.3 percent in typical suburban neigh-

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borhoods. These neighborhoods also exhibit lower vehicle miles traveled (VMT) per capita—9.8 VMT per capita versus 21.79 VMT per capita in suburban neighborhoods. This is enhanced by the fact that streetcars connect people to the larger transit system—further decreasing dependency on single-occupant vehicles. Secondly, streetcars encourage more dense development, which in turn reduces car trips and places a heavier reliance on public transportation. More dense development also helps to alleviate excessive land consumption by encouraging more urban projects. Not only does Portland use their future Streetcar System Plan as a way to achieve their sustainability goals, studies have been able to predict a significant reduction in automobile trips as a result of future expansions of the streetcar system. In short, streetcars can serve many purposes and help cities achieve multiple goals, including the provision of an urban circulator, connections to a larger transit system, tourism benefits, the creation of a sense of place, a guide and generator for development, and sustainability benefits.

Planning for streetcars involves ideas that span from large regional or district-wide ideas to details that include the length of a streetcar stop. At the city scale, the idea can be formed and gain traction in different circles. David Taylor notes that “cities champion streetcar projects more often than transit agencies do because while streetcars provide transportation, they are also tools for changing land use and promoting

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10 Vicki Quick, “The Trip Not Taken: The Travel Impacts of Streetcars,” in Street Smart: Streetcars and Cities in the Twenty-First Century, ed. Gloria Ohland and Shelley Poticha (Reconnecting America, 2009), p. 54

11 Ibid.
economic development and job generation—all areas under the purview of cities, not transit agencies. The planning process demands cooperation between many city agencies, often including the departments of transportation, planning, economic development, and regional planning. There may be private stakeholders, non-profit advocacy groups, and elected officials involved as well.

The process typically begins with at least one feasibility study in order to determine the possibilities for streetcars in a city or district. Simply in defining the scope of the feasibility study, however, city agencies are determining a large part in the planning process. Theoretically, the agency that requests the feasibility study has taken measures to best determine the scope of such a project, cooperating with other involved agencies and stakeholders. In some studies, for example, the potential streetcar district to be studied is predetermined before doing a city-wide study to determine the best district or general alignments. In many cases, the feasibility study can determine the following:

- A decision about the best alignment for the trackway and best locations for the stations and maintenance facility;
- A ridership estimate;
- Estimates of potential redevelopment and possible revenue generation;
- An assessment of the impact on utilities;
- An examination of the impact on parking, and the streetcar’s potential use as a parking-management tool;

12 Taylor; “Place Making and People Moving,” p. 23-4
• A decision about the level of environmental review necessary for project implementation;

• Identification of the ways in which existing plans and ordinances would be impacted;

• Review and evaluation of potential revenue sources;

• The decision to proceed with either federal or local funding; and

• A preferred implementation program.\textsuperscript{13}

Feasibility studies should also include a detailed development analysis and parking management analysis. The development analysis can help to determine future tax revenues in the district based on "the use of the property appraiser's assessed valuation, recent land and real estate sales and transactions, current and proposed public investments, the availability of vacant and underutilized land, the existence of publicly owned off-street parking, underdevelopment as indicated by current zoning designations, and potential areas for redevelopment as identified by city staff."\textsuperscript{14} Development analysis can also highlight zoning code issues that could pose barriers to streetcar-oriented development. In certain cases, it may be determined that the mix of uses that are desired along the streetcar route are either illegal (determined by out-of-date, single-use zoning codes) or very time-intensive (and thus more expensive) for developers to achieve. Allowing for mixed-use development and making the permitting process more

\begin{footnotesize}
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  \item \textsuperscript{13} Ibid. p. 27
  \item \textsuperscript{14} Ibid. p. 27
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streamlined for developers along the route enhances the feasibility of a streetcar route. Form-based codes are a good example of streetcar-friendly zoning. Dictating the form of the buildings in a district or along a corridor, rather than the specific uses within them, they allow for a greater mixture of uses and thus a more pedestrian-oriented environment.¹⁵

The cost of installing streetcars in the United States today varies based on many factors, including the level of service provided, the length of the route(s), the number of vehicles in operation, whether construction is paired with other public works projects, variable operational costs, etc. The largest costs, and those that will be discussed below, include the cost of construction, vehicle costs, maintenance or operational costs, and overall financing costs. A feasibility study can cost between $200,000 and $500,000, however this does not account for the cost planning that takes place within city agencies prior to the study.

In very general terms, streetcar systems are much cheaper than their relatives in the urban rail family and can cost anywhere from $12 to 25 million per mile. This cost is compared to $50 - $75 million per light rail mile. Despite the same rails, light rail is much more expensive due to the fact that,

Light rail trains require street excavation of at least two feet, which requires removing and relocating utility lines. Modern streetcars use about a one-foot (0.3-m) excavation for shallow slab construction,

and utilities typically are avoided. In addition, light rail requires extra structural support for many bridges, whereas modern streetcars do not. The streetcars basically weigh the same as a semi trailer truck.16

Initial streetcar lines are often more expensive per mile than future extensions or lines, based on the need to purchase cars and build a maintenance facility. All modern streetcars operating in the United States have been designed and built in the Czech Republic by Inekon/Skoda. When ordered “off the shelf,” these vehicles only need minor adjustments to function in the United States and can be much cheaper than custom orders. Vehicles typically cost about $3 million each.

Fares alone do not cover the cost of operation, so other sources must be used. In order to maintain and operate the vehicles, “innovative organizational structures and partnerships are key.”17 Obvious partnerships exist with the transit agency, which may provide funding equal to that of the bus service that would be required to run on that route without the streetcar:

Financing streetcars in the United States today takes creativity and a wide mix of funding options. There are federal, state and local funding options, and a multitude of combinations of those sources could make a system financially feasible. As Charlie Hales and David Taylor note, “streetcar-financing strategies are more different than similar; and are characterized by the creative leveraging of local, state, and federal


18 STREETCARS: THE BASICS AND BEYOND
funding and opportunism. At the federal level, financing is available in multiple ways, the most promising being the Small Starts program within SAFETEA-LU, or the Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users. Although the Federal New Starts program does help to finance large transportation projects, the minimum financing projects can seek is $75 million. Additionally stifling to streetcar projects, the New Starts program placed a large emphasis on cost-effectiveness when choosing which projects to fund. While cost-effectiveness sounds like a rational way of assessing transportation projects for funding options, cost-effectiveness is measured as the total cost of the system divided by the time savings per user. Because streetcar systems are urban circulators and not high-speed regional systems, their goal is not to save users time but to transport more people at one time through a given district. For this reason, New Starts funding is difficult to use for streetcar projects.

The Small Starts funding program was introduced to help smaller transportation projects that could not receive New Starts funding. For Small Starts financing, projects can seek no more than $25 million in funding and the overall cost of the project can be no more than $250 million. Small Starts funding is promising for streetcar projects because it includes economic development generation in its criteria for funding, something that New Starts funding does not. Managed by the Federal Transportation Administration (FTA), it is evaluated using three criteria including 1) Planning, Alternatives Analysis, and Project Funding, 2) Project Justification, and 3) Local Financial Commitment. Whereas New Starts funding is evaluated on a 20-year timeline, Small Starts funding will be evaluated on a 1-year timeline. This means that projects will be evaluated based on the benefits they will provide one year after opening for service, as

opposed to twenty years after opening for service. While this is more in line with the timeline for a streetcar project than for a light rail project, the economic development may not be fully realized until five, ten, or even twenty years after a streetcar route opens for service. It is important to note that while no streetcar project has received Small Starts funding yet, many people in the transportation industry are confident that this federal program could prove viable for certain projects.\footnote{19}

For many cities, the deterrents to seeking federal funding are too great and too numerous. Federal funding places strict requirements on projects that add to the project’s timeline and the cost of the system. To start, the FTA requires a detailed Alternatives Analysis that increases cost. Additionally, any federal funding requires environmental studies under the National Environmental Protection Act (NEPA). This criterion also stipulates that the project must conform to state and local transportation improvement plans and must work with federal procurement and labor rules. Lastly, federal funds can limit a streetcar project due to the lengthy timeline of the grant money distribution. This requires that projects either borrow money (and then pay interest on that borrowed money) to avoid increased construction costs in the future, or pay increased construction costs in the future when they have all of the federal money at once. Amazingly, “the decision to seek federal funding can increase the total project cost by 10-15 percent.”\footnote{21}

State and local funding sources come in many forms and sizes. The combination of local funding that a streetcar project might seek is dependant on many factors. State sources could include

- state transit or rail or intermodal-service development programs as well as legislative earmarks and state infrastructure bank loans. Local funding options include local transit taxes and local sales taxes—including gas, hotel, restaurant, rental-car, or other business taxes.\(^{22}\)

Other local sources include parking revenue, such as parking garage bonds or parking meter revenue. Streetcars can generate some funding, typically for operations, by selling advertising rights in cars, at stations, on streetcar maps, and even on the outside of streetcar vehicles. Tampa, FL, for example, sold advertising rights for each individual car as well as the entire system. Some smaller streetcar projects have even received philanthropic or foundation funds. The most publicized funding sources for streetcars, however, are those generated from tax increment financing (TIF) districts and business improvement districts (BIDs). TIF districts are established based on the predicted increase in tax revenue that will result from development that surrounds the streetcar. Bonds are issued based on this predicted revenue and used to help finance the construction of the system. TIF funding “allows the city to direct new revenues derived from increasing real-estate value to infrastructure and other strategic investments that support the area.”\(^{23}\) A BID can contribute to a streetcar route in a similar way. Businesses along a proposed streetcar system might create a special assessment to help pay for a system that will generate more foot traffic, and thus more revenue for them.

\(^{22}\) Ibid. p. 40
\(^{23}\) Ibid. p. 41
in the future. The BID might assess fees as a percentage of the property value or based on the linear frontage along the route. TIF and BID financing, as well as other local financing structures create a sense of ownership and local investment in the system. Financing a streetcar route, let alone a system, requires not only cooperation from local agencies, but resourceful strategies to gather the funds necessary to get the system up and running. A city and its residents, having invested time, energy, and in this case money, can thus have more say in the character of the system and how it fits into its surroundings.

SERVICE

As a local circulator, streetcar service provides frequent stops and runs on relatively short routes to link neighborhoods and destinations in the city. Streetcar routes are typically less than five miles in length and can be much shorter. This is different from light rail lines, known as "line haul" systems, which typically transport passengers to and from suburban locations. Currently in the United States, headways are anywhere from every 13 minutes during peak times to every 20 minutes during off-peak hours. Different routes will experience different peak times depending on their ridership generators. Generators that would create different peak times might include: employment centers, weekend shopping, sporting events, tourist destinations, etc.

Streetcar stops are spaced fairly close together, allowing passengers to easily walk between stops if necessary. Streetcars typically stop every 900 to 1200 feet (or as often as every other block). This is different from light rail stations, which occur at distances of one half to one mile or more. Streetcars travel at slower speeds within the city than do light rail vehicles. The frequency of stops and their alignment (typically moving with traffic in a shared lane) dictate their slower speeds. One issue that has surfaced in light of "the streetcar renaissance [includes] the stigma of slowness attached
to streetcar travel." Including stops, streetcars travel at or below 12 miles per hour, whereas light rail vehicles, when not on streets but in their own right of way, can travel 20 miles per hour or more. Although there are studies for faster streetcar systems that make minimal stops and can operate in their own right-of-way, one has yet to be built. Streetcars are currently designed to travel with traffic, often operating at speeds no greater than 30 miles per hour. The slower travel speeds, however, also mean that the vehicles fit more closely with pedestrian-scaled development than their faster transit relatives.

Modern streetcars in the United States are designed to carry approximately 140 people per vehicle, and can seat between 29 and 41 passengers. This is almost double the number of passengers that most city buses can carry, and only slightly less than a typical light rail vehicle can carry. A streetcar's carrying capacity is dictated by the size of the vehicle, which relies on many factors, including the desired length of the vehicle (and thus the desired length of the stops) and the smallest turning radius on the route. These specific vehicle details are discussed below. Although modern streetcars carry fewer passengers than light rail trains (which are often one to four vehicles linked together), they carry more passengers than heritage trolleys and buses.

24 Spivak, "Streetcars Are Back" p. 109
26 Light rail vehicles are typically linked together in sets of two to four trains. The total train thus carries between 250 and 500 people.

Figure 1.4—On-board ticket vending in Portland, OR. Source: Photo by author.
Streetcar service and operations are not completely funded through fare collection and while general costs were discussed previously, it is helpful to understand the fare collection in relation to service provision. There are three theories and methods behind collecting fares. The first theory is to provide service free of charge, understanding that fare collection itself has costs that may outweigh the potential funds generated by the fares themselves. These costs include added staff, monitoring and servicing ticket vending locations, and possibly the cost of time it takes to collect fares on board the streetcar. Tacoma's streetcar operates on this theory and does not charge for service. The second method of fare collection is on-board, as shown in Figure 1.4. This requires that passengers pay a fee or show a pass to the operator at the front of the car. This method also means that passengers must step up onto the streetcar (at-grade or low-car entry is only in the middle of the car), and slows the boarding process. The last method of fare collection is a proof-of-payment system. Tickets are sold on board, at sidewalk kiosks, or in local shops and tickets from one mode of transit (bus or light rail) are valid for the streetcar as well.28

It is helpful to understand certain aspects of the streetcar vehicles that make them unique transit providers, including the types of streetcars operating today, their ease of use, and the details of the vehicles themselves. There are three types of streetcars in operation throughout the United States today: vintage trolleys, heritage replicas, and modern streetcars. Vintage trolleys are vehicles that were in operation historically in cities, and are the exact same vehicles running on new or existing tracks. Cars are often retrofitted to have air conditioning and wheelchair access. Most heritage trolleys in the United States are reinstated systems, meaning that service was suspended for

28 Furmaniak, "System Elements." p. 76
a period of time, often lasting years. These systems include San Francisco, Philadelphia, and Dallas. New Orleans has the longest running streetcar, in operation since 1893. Heritage replica streetcars are new vehicles designed to look like historic models. They operate on new tracks and are designed to have modern amenities such as wheelchair ramps and air conditioning built into the vehicles. These systems are in operation in Tampa, FL, Galveston, WI, Kenosha, WI, Memphis, TN, and Little Rock, AR. Modern streetcars are in operation in Portland and Seattle, but planning is in the works for multiple cities, including Washington, D.C. and Charlotte, N.C.29 A map of the operating and planned streetcar routes is shown in Figure 1.5.

One of the benefits of modern streetcars is their user-friendly design. A streetcar’s smooth ride allows passengers to stand more easily than on a bus, and the “low floor center section has few seats, allowing for wheelchairs, carriages, and bikes, as well as standees.”30 Modern streetcars are also very accommodating to wheelchair passengers in their boarding mechanisms. The lower center section has a small wheelchair ramp, shown in Figure 1.6. This ramp is designed to cover the distance between the curb and the vehicle and can be activated by passengers with a button—both in and out of the vehicle—as well as by the operator. Most vehicles in the United States are 66 feet long and approximately eight feet wide, compared to many European trams, which are typically between 80 and 115 feet long. In both cases, the vehicles have pivoting joints to allow for smaller turning radii. The user-friendly aspect of streetcars is further discussed below related to their appeal.

29 ______, “Streetcars to Admire: Vintage, Replica, and Modern.” p. 70-3
30 Ibid. p. 71
Streetcar infrastructure consists of the tracks, stations and stops, the power source, and the maintenance facility. It is also interesting to highlight some of the new rail technology that is currently being explored around the context of streetcars. Streetcars in the United States generally operate in public right-of-way space, traveling with traffic and obeying intersection traffic laws. This requires that streetcars stop for stop signs and red lights. In some contexts, they have traffic signal prioritization, allowing them specialized signaling through intersections. This can be activated through train-to-wayside communication (TWVC) and allows for communication between the streetcar and the traffic control system for the city. Streetcar systems can be aligned to the right lane, known as curb side alignment, the left lane, known as median alignment, or operate in their own exclusive right-of-way. Different sections of a route may call for different alignments, which is possible given the streetcars’ dual-sided entry doors.

Streetcar tracks are less intrusive from a construction point of view than light rail lines. Due to the weight of the streetcar compared to a light rail vehicle (streetcars are much lighter), the track base need not be as deep. Due to the shallow track structure, laying streetcar tracks doesn’t interfere with public utilities to the same degree as light rail tracks, reducing the cost of the track bed. This also speeds the process of track construction, which can be completed at a rate of 600 feet every two to three weeks. In Portland, for example, they completed three blocks of track every three weeks. This also ensures limited business and residential traffic disruption during the construction process. Having one lane of traffic closed for three weeks is bearable, compared to more lengthy closures for light rail systems. Streetcar alignment should also consider the city's bike system as well. It is advisable to locate bike lanes that run parallel to the streetcar on adjacent roads, and ensure bike routes cross the streetcar tracks perpendicularly, as in Figure 1.7. This is to avoid bike tires getting caught in streetcar tracks.
Proper signage and a general education of how to cross streetcar tracks on a bike can become part of the bicycle culture in a city, allowing streetcar and bike routes to provide more transportation choices to residents.

Streetcar stops are simple platforms and can be shared by bus routes, making the stop design worthwhile for both modes of transportation. Streetcar vehicles' loading height is 14 inches above the track level. Most cities have a 10-inch curb at streetcar stops, requiring a 4-inch step up into the car. Again, the short ramp can be quickly activated to allow strollers and wheelchairs to enter or depart the streetcar. In Washington DC, where they are planning for a new streetcar system, they will have 14 inch curbs and allow for flat boarding. The ramp or platform will still be deployed for wheelchairs only to cover the gap between the pavement and the vehicle. Stops are generally short, approximately 40 feet long, and have basic signage and can have a covered shelter depending on the climate. Designs for stops must “consider adjacent land use, on-street parking, pedestrian accessibility, and the interface with bicycle lanes.”

Although the best streetcar lines are aligned separately from bike lanes, in some cases it cannot be avoided that they use the same street. If the streetcar operates in the right lane (curb-side), the bike lane can be routed up a slight ramp and “around” the streetcar stop, such as in Figure 1.8 from in Portland, OR. This allows bikes to keep moving around the streetcar as well as gives passengers a safe location to dismount from the streetcar that is out of the bicycle lane. If the streetcar operates in the left-lane (median alignment), then bike lanes are not impacted. In general, streetcars to not require large platforms or “stations” for stops but rather use simple additions to the sidewalk and street design.

Figure 1.7—Cyclist crossing streetcar tracks at perpendicular angle in Portland, OR. Source: Photo by author.

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The power distribution for streetcar systems comes from overhead wires, known as the overhead contact system (OCS). Catenary wires are double wires that allow for more overhead current and thus higher speeds. Trolley wires are single wires that carry less overhead current and thus operate vehicles at lower speeds. Both systems can be hung from a variety of mounting scenarios, including modified street posts, light posts, and adjacent buildings. The power supply to streetcar is known as the traction electrification system (TES). Streetcars operate on direct current (DC) voltage and typically require 600 to 750 volts to operate. Because local utilities supply power in the form of alternating current (AC), TES substations provide transformers along the line.  

Maintenance facilities, also known as bus barns, provide space that supports the day-to-day functioning of the system. Space is allocated to store, clean, and perform maintenance on vehicles when they are not in operation. Space is also needed to store system materials, such as rails, overhead wire, platform materials, etc. These facilities also provide space for the operations management, dispatching, emergency response equipment, and staff locker rooms. Cities can be inventive as to the location of their maintenance facility and the use of the property in the financing stages. For example, Seattle's bus barn helped finance the system by selling the air rights above it, and Portland's bus barn is tucked under an elevated highway.

New technology is pushing the boundaries of streetcar operation and design. Some of the new technology sounds too good to be true, but it will be interesting to follow its development and potential use in the future. One technology that is in use is re-

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33 Tom Furmaniak, "Car Barns," in Street Smart: Streetcars and Cities in the Twenty-First Century, ed. Gloria Ohland and Shelley Poticha (Reconnecting America, 2009), p. 77
generative breaking. The breaking components of the streetcar generate power and send it back into the grid system. This technology is in use in Seattle and can be beneficial in cities with hilly terrain. Other new technology includes running streetcars on alternative fuel sources. The recently opened streetcar line in Savannah, GA runs on biodiesel sourced from cooking oil from local restaurants. This eliminated the need for overhead catenary lines that many thought would disrupt the character of the historic neighborhoods. New technology that would eliminate the need for overhead wires includes fuel-cell vehicles. Fuel-cell buses have been successful in pilot programs throughout the country. Stan Thompson, with the Hydrogen Economy Advancement Group, believes that fuel cell streetcars, or “hydrolleys” could be a good solution to both the power-source problem and the aversion to catenary wires. Another system to avoid overhead lines is to power the streetcars with an in-street third rail. Although the immediate reaction is, there have been technological advancements in the hardware to supply this system that protect pedestrians and others from the electrified rail. However,

this problem can be solved by making the power rails a series of separate sections—the system can switch each section on or off individually so that a power rail section is energized only when the vehicle is directly over it.

34 “Seattle Streetcar Webpage,” http://www.seattlestreetcar.org/
If the streetcar or light rail vehicle is not directly above the third rail, which is embedded slightly below the concrete, there is no energy conducted to the rail. The INNORAIL system, as it is known, is in operation in Bordeaux, France, but has yet to see introduction to the United States. New technology, such as those mentioned here, have the ability to expand streetcar and other urban rail systems in the United States to areas where certain restrictions, such as historical district compliance, may have prevented them before.

Lastly, it is important to discuss the relationship of streetcars to their surroundings, including the appeal of streetcars, their relationship with pedestrians, on-street parking, and bike routes, their noise levels and their effect on urban pollutant levels. First of all, streetcars appeal to a wider demographic than bus systems. Buses have long been stigmatized in the United States as transporting only those that cannot afford a car. They carry the transit-dependant, or people that have no other transportation options. Rail transit—from light rail to streetcars—is known to attract people that have the choice of driving their own car, but choose to ride transit. The Toronto Transit Commission, for example, estimates that 60 percent of streetcar riders are car owners that choose to leave their cars at home.37 Because streetcars can attract car owners to leave their vehicle at home, they can help to reduce the demand for road capacity and parking. So why can rail attract lower and middle class riders and buses typically cannot? Streetcars provide “a high quality transit ride over smooth rails, and without the bumps and lurches common to a bus ride.”38 Some believe that streetcars are appealing for nostalgic reasons, “that there seems to be an ancestral memory of what

37 “Seattle Streetcar Network and Feasibility Analysis.” p. 6
38 Taylor; “Place Making and People Moving.” p. 23
they were, and it is a pleasant memory.” While many heritage replicas and vintage systems certainly appeal to people’s nostalgic sides, modern streetcars can also evoke a feeling of progress in a city.

The success of streetcars is attributable to their relationship with the pedestrian. Both the vehicles themselves, as well as the development they attract are more pedestrian friendly. First, streetcars themselves appeal to riders because they are at a human scale—by walking straight on board and viewing the city from a vantage point that is similar to that of standing on the street, passengers still feel as though they are pedestrians. Streetcar lines also “elevate the importance of pedestrians, making them into first class travelers, and serve as a ‘pedestrian accelerator’ that extends the short trips that can be made on foot.” In this way, the pedestrians begin to enhance the streetcar routes, which in turn enhance the pedestrian’s experience. The two go hand in hand to support one another. As was previously discussed, in order for this streetcar-oriented development to occur, the proper zoning and planning must be in place. But because “urban designers and planners now understand that people like to spend time in places where there are other people moving about, rather than in places that largely serve as storage areas for either goods or cars;” this type of development is gaining traction throughout the country. Streetcars are also more pedestrian friendly because of their quiet operation. Whereas buses are known to be loud and emit unpleasant pollution, streetcars emit no direct pollution and operate on quiet rails. One French study conducted sound tests on 60 people and determined that there was less annoyance from tram noises than from bus noises when mixed with the sound of

39 Weyrich, “Bring Back the Streetcars!” p. 7
40 Taylor, “Place Making and People Moving,” p. 23
41 Ibid. p. 23
general traffic and other urban sounds. For this reason, walking, living, or working along a streetcar route is more bearable than along a bus route. While vehicles operating on traditional trolley lines do not operate pollution-free, fumes are not emitted from the vehicles themselves. This in turn makes the pedestrian urban environment more enjoyable. The source of energy that is used to power the vehicles, whether it is coal, wind, hydrogen, or biofuel, will determine the overall system’s impact on emission levels. Cities concerned with reducing carbon emissions could consider alternative power sources for streetcar systems.

The relationship of streetcars to on-street parking is similar to that of buses and on-street parking. The difference is the location of the bus stop versus the streetcar stop. Both eliminate the possibility of automobile parking on a section of the roadway for a distance of 30 to 40 feet. A bus would swerve to the curb to pick up passengers, where a streetcar stop is “bulbed out” to meet the streetcar, keeping the tracks traveling straight down the right-of-way. While businesses might be concerned about the loss of some on-street parking, they will gain back more customers as streetcar riders than they lost in the three to four parking spaces that were substituted for a streetcar stop. In many cases, the streetcar stop may not remove any parking spaces at all if it replaces a bus stop.

Streetcars not only interact with pedestrians and cars, but also with bikes. The most evident problem is in the track design, where bike tires can get caught in the track bed, causing the cyclist to fall. Solutions to this problem include educating bicyclists about the dangers of riding near the tracks, proper signage warning cyclists of approach-

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ing tracks, educating cyclists how to properly cross streetcar tracks when necessary, routing bicycle lanes parallel to tracks, and having bike lanes cross the tracks at perpendicular angles. It is fascinating to see historic videos of cities in the early 1900s because many bikers used the smooth roadway between the streetcar tracks as a great place to ride. One such video is from the Spanish documentary filmmaker Ricardo de Baños, titled “Barcelona en tranvia.” It is mesmerizing to watch the view from the front of the streetcar as it travels in through the city. People casually walk in front of the vehicle as it quietly passes through different neighborhoods. Cyclists weave in front of it, ride between its tracks, then dart across to stop and watch it go by. As long as they made a quick, angled movements across the track, they were able to cross without any problems. Today, with proper coordination of streetcar route alignment and bicycle network planning, in addition to educating cyclists how to best interact with streetcar tracks, bikes and streetcars can coexist once more.

In summary, streetcars create many opportunities and benefits for a city through proper planning, creative financing and cost-management, the service they provide, and the way in which they interact with the city. The next two chapters will highlight how Portland, OR and Seattle, WA capitalized on these opportunities to develop streetcar routes, and more importantly, fostered support to create streetcar systems to service a wider area of residents.

REFERENCES


Interview with Patrick Sweeney, Portland Department of Transportation. Telephone Interview, March 13, 2009.


Portland's success with their streetcar highlights a key issue for the future of streetcars in American cities: the streetcar is as much an economic development tool as it is a transportation provider. As an economic development tool, a streetcar line can attract development or redevelopment and similarly, major development infill projects can attract streetcar lines. As a provider of transportation, the streetcar provides an urban circulator that connects riders to the larger transit system as well as to key destinations and employment centers. Additionally, as the first modern streetcar system in
the United States, Portland’s streetcar is demonstrating how to best plan and expand a streetcar system. This planning process, called the Streetcar System Plan, provides an interesting study from which Denver and other cities could benefit.

To highlight some of the key findings from Portland’s experience with streetcars, I will discuss the goals for the system, the route, planning process, financing and operations, the future of the streetcar in Portland, and how to measure success of the mode in a city known for its public transportation.

Portland Streetcar, Inc. (PSI) the non-profit that developed and manages the streetcar line in Portland, OR clearly states four goals for the unique transit mode in their promotional and educational material. Those goals are to:

- Use a commitment to a high quality transit service as an incentive for high-density mixed-use development within the Central City. Link neighborhoods with a convenient and attractive transportation alternative and attract new transit ridership.
- Connect major attractions in the Central City with high quality transit.
- Build and operate in mixed traffic and on existing rights-of-way at lower cost than other fixed rail options. Fit the scale and traffic patterns of existing neighborhoods.

PORTLAND STREETCAR GOALS
• Reduce short inner-city auto trips, parking demand, traffic congestion and air pollution.¹

These goals, as written, could be applicable to almost any city in the United States today. They are careful to combine both an incentive for development and increased transportation provision in the first goal, and go on to discuss where the streetcar should go (major attractions), how it should operate (with cars, and at a scale of the existing neighborhoods), and finish with the benefits that such lines could have on the city.

THE ROUTE

Portland’s first and currently operational line lives up to the second goal for a streetcar by connecting major attractions (and thus ridership generators) in the downtown area with a quality of transportation service. Patrick Sweeney, of the Portland Department of Transportation, notes that the first line "connected a significant employer, Good Samaritan Hospital, with Portland State University at each end, and then went through a major development area in the middle. It was strategically planned to have big ridership generators at each end."² The route not only connects major employers, but also connects multiple different land uses that generate different types of riders at different times of the day. Residential areas along the line, such as the Pearl District, the River District, the South Waterfront, and Portland State University all draw riders that complement (and in many cases overlap with) riders that are accessing the retail opportunities of the Pearl District or downtown, the educational activities around Portland State University, or the employment opportunities all along the route. The

² Interview with Patrick Sweeney, Telephone Interview, March 13, 2009.
route's access to multiple types of ridership generators, in the form of multiple land uses and key employment centers, has been a key to the success of Portland's first streetcar line.

Figure 2.4—Map of the current Portland Streetcar. Source: www.portlandstreetcar.org.
The first tracks that led to streetcar in Portland began not with actual rail, but with a planning process that took place well before opening in July of 2001. In the early 1990s, City Commissioner Charlie Hales was instrumental in spreading the word about the potential for streetcar to fill the city's need for an urban circulator, something that had been referenced in Portland's 1972 Downtown Plan. In 1990, the City of Portland "formed a citizens advisory committee comprised of neighborhood activists and business leaders and contracted for a feasibility study of providing rail-based transit," to supply the urban circulator. In 1995, PSI was formed and successfully bid to design and manage the streetcar project. PSI is under the leadership of "a board of directors representing both the public and private sectors," theoretically creating well-balanced input in the planning and operation of the streetcar. Six years later, the first modern streetcar project in the United States opened for business, managed by PSI and operated by Portland's transit agency, TriMet.

A critical component throughout the process for the first line in Portland was strong partnerships between both the public and private sectors. Aside from financial support, which will be discussed below, public-private partnerships helped both the city and developers meet mutual goals for the project. This is highlighted in the development of both the Pearl District and the River District, two successful mixed-use areas that have worked with the City and Streetcar to accomplish various public and private goals. For example,

4 Ibid.
The Portland Development Commission (PDC) negotiated a Master Development Agreement with Hoyt Street Properties, owners of a 40-acre brownfield in the heart of the River District. The Agreement tied development densities to public improvements with the minimum required housing density increased incrementally from 15 to 87 units per acre when the Lovejoy Viaduct was deconstructed, to 109 units/acre when the streetcar construction commenced and 131 units/acre when the first neighborhood park was built. The developer has stated that without the Streetcar and the accessibility it provides, these densities would not have been possible. The agreement was a unique and essential piece of the public/private partnership that catalyzed development of the River District and serves as a model for the agreement established for in South Waterfront.\(^5\)

This partnership proves that both the City and the Developer could achieve their goals working together around the streetcar. The City achieved much more dense development focused on transit and developers could develop more units, making the developments much more financially feasible. Carl Abbott, a professor of Urban Studies and Planning with Portland State University believes there was little opposition to the streetcar during the planning phases, but rather extensive negotiation between public and private stakeholders was required to reach acceptable route negotiations, allowable FARs, and financing agreements.\(^6\)

\(^6\) Interview with Carl Abbott, In-person Interview, Jan 12 2009.
There was significant public involvement in the planning process for the first line, which is often related to the success of the streetcar and the surrounding developments. Sam Adams, once Portland’s Commissioner of Public Utilities, links the success of the planning process to informed and educated citizens and a business community that “[does not] subvert community goals to their financial interests.” This culture of public involvement allowed public investment to move in tandem with development, something that rarely occurs as smoothly as it did in Portland.

The planning process for the streetcar in Portland also accounted for financial efficiency both in the construction of the line and in its operations. As previously mentioned, streetcars are less expensive than traditional light rail technology, both in the cost of track construction and the vehicles themselves. Portland achieved and outlined five critical design principles to realize the streetcar project: The first principle was to use available rights-of-way for laying track, minimizing any need to purchase or take land. The second principle was to limit the investment in facilities to the basics, such as keeping streetcar stations simple and basic. One of these simple stops is shown in Figure 2.6. By using almost off-the-shelf equipment, the third principle, Portland was able to minimize costs of the actual vehicles. They worked with the Czech company, Skoda, to slightly alter a basic streetcar model for use in the United States. The fourth principle was to operate the system on a safe, no-frills basis. The fact that modern streetcar was making its first appearance in the United States highlighted the fact that the mode needed to be reliable and set a good example for the rest of the country.

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8 “Portland Streetcar: Development Oriented Transit,” p. 5
9 Ibid., p. 6
It was also designed to “avoid interference with utilities, to allow for ease of access to the utilities, and to be constructed rapidly.”10 This last point is particularly important to understand the positive relationship of streetcar to existing businesses along the route. Portland was able to lay track at a rate of approximately one block in two weeks. This minimized interference with business operations as well as existing traffic.

Portland’s initial streetcar route has been extended two times since operation began in 2001. The first extension aimed to connect the new residential and mixed-use development along the South Waterfront and began construction in January of 2005. Just a year and a half later, another extension started construction to further connect more development along the South Waterfront. “This $13.5 million extension (known as the Lowell extension) opened in August 2007 and encompasses even more of the South Waterfront District in its route.”11 Again, planning for these extensions involved a commitment from the City, PSI, and the property owners along the route to negotiate consensus about the route and development densities that would support and surround the route.

Portland’s next strategic move in expanding their streetcar network is called the East Loop and will connect the downtown core to the urban areas across the river to the east. The new loop will continue the existing mode of transit across the river, meet goals outlined in the Central City Plan to increase housing units, transport 3.5 million riders per year; reduce regional vehicle miles traveled by 28 million miles per year; and be a magnet for 2.4 million square feet of development along the route. It will do this without creating significant environmental impacts, and it could be argued that

10 “Reinventing Downtown: 2005 Rudy Bruner Award for Urban Excellence.” p. 18
11 “Community Building Sourcebook: Land Use and Transportation Initiatives in Portland, Oregon.”

Figure 2.7—The planned East Side Loop Map. Source: Portland Department of Transportation.
the anticipated vehicle trip reduction is a positive environmental impact. TriMet also highlights that this newest route, which would create the beginnings of a true streetcar network in Portland, “achieves and supports regional and local transit, environmental, and economic development goals.” The route, shown in Figure 2.7, will initially connect with the Central City core over the existing Broadway Bridge and create 28 new stops on the East Side. Eventually the route will create a true loop when a new bridge is built across the river to the south.12

FINANCING AND OPERATIONS

Portland’s first route was financed through a combination of federal, state, local, and private funds. The capital budget for the initial line from Northwest Portland to Portland State University totaling $56.9 M, included funds from City parking bonds, tax increment financing, the City parking fund, the City General Fund, the City Transportation Fund, a U.S. HUD Grant, Federal Transportation funds, and from an innovative local improvement district. It has been said that “this is a streetcar built by the automobile,” as the largest component of the financing came from the City parking bonds. The next largest contribution came in the form of the local improvement district (LID). Chaired by a local business owner, the LID raised $9.6 M towards the capital budget, including $2 M from Portland State University and $1.6 M from Legacy Good Samaritan Hospital. Both institutions had reason to support the streetcar so as not to have to provide as much parking on their campuses for students and employees. Hoyt Street Properties, who owned land in the Pearl District, contributed $0.7 M. The remaining $5.2 M was collected through an LID assessment tax, which assessed at $6 per $1,000 of property value for properties directly on the streetcar route, and at $3

per $1,000 of property value for those within one block of the route. According to Patrick Sweeney with the Portland Department of Transportation, using a LID to capture the value of development, both existing and future, to help pay for streetcar “worked in the central city, where property values are high and where the property owners help chip in and pay for the infrastructure.” However, as Sweeney noted in reference to Portland’s Streetcar System planning process, an LID is not a solution for every location. Some areas that would benefit from streetcar simply do not have the property values necessary to support the mode via an LID. For the first route and its extensions, however; capturing the value of development through the assessments and contributions of the LID made the project possible.

Financing required for the first two extensions was much less than that required for the initial route, due to the fact that vehicles had been purchased and the extension areas were not in the City Center, where there was more chance for interference with utilities, businesses, and existing automobile traffic. Both extensions were 0.6 miles long and cost approximately $16 M each. When all was said and done, the total Portland Streetcar route cost $12.9 M per track mile on average and included the purchase of ten vehicles, the construction of the maintenance facility, and some roadway improvements along the route.

Operations of the route are funded in part through City-owned parking meters and garages as well as through car sponsorships (naming rights and or advertising rights in and on streetcar vehicles). “Approximately two-thirds of operating costs” come from

14 Interview with Patrick Sweeney, Portland Department of Transportation, Telephone Interview, March 13 2009.
TriMet, the regional transit agency that operates the vehicles. TriMet also operates a seamless fare system, allowing passengers to use the same transit passes for the streetcar, buses, light rail, and even the Aerial Tram that connects the new Riverfront Place development to the Oregon Health and Sciences University, as in Figure 2.8. In addition to the seamless fare system, operations for the streetcar are improved for passengers in the Central Business District through the “Fareless Square” program. Passengers within a certain boundary, shown in Figure 2.10, can board light rail and streetcar without paying any fare. On-board transit employees check passenger passes or fares at random to ensure proper payment outside of the fareless zone.

Portland Streetcar currently operates from 5:30 am to 11:30 p.m. on weekdays, at a minimum of every twenty minutes and up to every 13 minutes during peak periods. Service hours are slightly different on weekends, but frequency is maintained for high weekend shopping ridership demands. To enhance the rider experience, Portland has installed real-time GPS tracking at many of the streetcar stations, telling passengers how long they should expect to wait until the next vehicle arrives. This system is also available to access from the internet as well as on portable devices, such as cell phones as shown in Figure 2.9. The interactive map updates the exact location of where the streetcars are along the route, allowing passengers to reduce or nearly eliminate their waiting times.

As the success and popularity of Portland’s first route became apparent to residents and transportation advocates alike, the city began planning not only for extensions to the existing line, but also for an interconnected system. As soon as the first route

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15 “Community Building Sourcebook: Land Use and Transportation Initiatives in Portland, Oregon.” p. 4
Figure 2.9—Nextbus' real-time GPS tracking system shows where the streetcars are on the route. Source: www.nextbus.com.

Figure 2.10—Portland's Fareless Square. Source: Portland METRO.
was operating, Commissioner Charlie Hales was contacted by neighborhoods in the city that wished to explore streetcar for their districts, including the area just east of the downtown, across the Willamette River. As the requests began to accumulate, there was no way for the city to evaluate potential routes. This created the need for a Streetcar System Plan that would allow the city to "evaluate and identify future corridors for further study." Portland is looking into a route that would connect the central city to Lake Oswego, and Hillsboro, a suburb of Portland, is looking into a streetcar for their office park. That said, the city has since launched a detailed and comprehensive planning process to best determine future streetcar corridors.

The planning process, outlined in Figure 2.11, includes three phases that will eventually produce a Streetcar System Plan the city will use to better direct future streetcar projects. The process began with evaluating all appropriately rated corridors from Portland's Primary Transit Index with the goal to narrow the list of corridors down to a select few that would then create the streetcar system. According to the mission statement, the System Plan will "identify an interconnected system of streetcar corridors integrated with the City's transportation and land use network. The Portland SSP will play a key role in shaping the City by reinforcing walkable neighborhoods and vibrant main streets that encourage sustainable development and infrastructure, reduction of vehicle trips, and supporting greater accessibility, housing options, employment and

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16 Interview with Patrick Sweeney, Portland Department of Transportation.
17 The Primary Transit Index was created in 2007 by the Portland Department of Transportation and analyzed 210 miles of potential transit corridors in the city to better direct growth and influence land use decisions.
CITY WIDE STREETCAR CORRIDOR TECHNICAL EVALUATION PROCESS

Primary Transit Index
Selection Criteria:
* Transit Oriented Index & Housing, Employment, Retail Densities
* Primary/Secondary Anchors
* TriMet Level of Service

Total Primary Transit Index (PTI) Corridor miles = 210
Level 1 - 138 miles
Level 2 - 53 miles
Level 3 - 21 miles

Select City-Wide Set of Promising Corridors
Selection Criteria:
* Primary Transit Index Rating of 1 and 2; or
* PTI Rating 3 with Metro-Designated Main Street
* Eliminate Based on Fatal Flaws
* Fill Gaps in Coverage/Missed Opportunities

Phase I
Total Miles = 114
Level 1 - 82 miles
Level 2 - 16 miles
Level 3 - 17 miles

Phase II A
Total Miles = 16
Remaining - 76 miles
Deferred to Portland Plan - 40 miles
Metro Study - 16 miles

Phase II

Select Best Streetcar Corridors
Selection Criteria:
* Visible Transit Option with Adequate Ridership
* Ability to Catalyze Re/Development
* Demonstrated Public Support

SELECT BEST SYSTEM
Selection Criteria:
* Ability to Support Peak-Oil/Sustainability Strategies
* Structure/Catalyst for Future Main St Growth
* Ability to Integrate with Existing Neighborhoods

DRAFT STREETCAR SYSTEM
Evaluate Implementation Strategies

FINANCING
* Operations
* Phasing
* Community Support

Phase III

FINAL PORTLAND STREETCAR SYSTEM PLAN

Figure 2.11—The Streetcar System Plan process. Source: Portland Department of Transportation.
economic development." Portland clearly expects much more than just mobility and accessibility out of this seemingly simple transit mode.

The three phases of the Streetcar System Plan process include corridor screening, corridor evaluation, and system evaluation. Corridor Screening completed "a fatal flaw" screening which examined all of the potential citywide transit corridors to identify just those corridors that could work for streetcars." The second phase was broken into two parts, the first of which sought to highlight both compatibilities with existing land uses and conflicts with traffic. The next step of phase two looked at the development potential, transit-oriented land uses, right-of-way issues as well as included a major community involvement component to gauge community support. District Working Groups (DWGs) were formed throughout the City of Portland and included citizens and business owners, from high school students to neighborhood association board members. The members of the DWGs participated in a detailed series of workshops and then conducted their own research into where streetcar would best fit into their neighborhoods. In many cases, they conducted surveys and interviews and eventually compiled reports and suggestions. These reports emphasize the high level of public participation in and understanding of the streetcar system planning process. The third phase of the process, which is currently ongoing, is system evaluation and involves compiling all the recommended streetcar corridors from the District Working Groups into a series of streetcar systems that "will then be evaluated for compatibility with the

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19 Ibid, p. 5
existing transit system.” At the completion of the project, Portland hopes to have a viable Streetcar System Plan.

There has been a high level of public participation that has taken place during the planning process, as highlighted by the Northwest DWG Report. Patrick Sweeney noted that he was continuously impressed with the amount of time and effort the members of the DWGs devoted to the process: “One of the things that surprised me the most was how willing citizens were to dedicate a lot of their time to looking at this issue.” Between April and September of 2008, the Northwest DWG met fourteen times and narrowed the initial eleven corridor possibilities down to three recommended corridors. They did this by walking, photographing and documenting each corridor, surveying residents and business owners in their district, reporting back to the group the advantages and disadvantages of each route, and looking for “development potential, potential conflicts with other modes of travel (e.g. streetcar tracks on designated bicycle routes), types of existing development, and existing destinations.” Surveying 545 people, they attempted to gauge interest in and opinion of streetcar in general, as well as gather opinions about specific route alignments. The survey showed that 83 percent of respondents think “streetcars are a good thing” and note “strong support for more streetcars in Northwest Portland.” Overall, the citizen engagement and surveys helps to build support for the future Streetcar System Plan.

20 Ibid. p. 5
21 Interview with Patrick Sweeney, Portland Department of Transportation.
23 Ibid. p. 12
By creating the Streetcar System Plan, Portland hopes to "1) help the City achieve its peak oil and sustainability strategies, 2) provide an organizing structure and catalyst for the City's future growth along streetcar corridors, and 3) integrate streetcar corridors into the City's existing neighborhoods."24 The last two goals are particularly interesting. The City is clear about using the transit mode as a tool to direct future growth in the city as well as help to preserve existing neighborhoods. It is difficult to believe that one tool, streetcar, could concurrently foster growth and preservation. Although these two goals seem to conflict on some level, with coordination between the Transportation, Planning, and Economic Development departments, these two goals can be achieved. By directing growth to areas that can accommodate more density or have fallen into disrepair, there would theoretically be less pressure placed on existing, desirable neighborhoods to absorb that growth.

The Streetcar System Plan has developed a list of three key factors to determine the potential success of future streetcar corridors. A successful streetcar corridor will "be a viable transit option with adequate ridership, have redevelopment potential, and demonstrate community support to make the changes necessary for a successful streetcar corridor."25 These goals and key factors are excellent starting points for other cities wishing to replicate Portland's success with streetcar.

In order for other cities, including Denver, to replicate the success that Portland has seen with streetcar, it is necessary to measure what constitutes success. Success in Portland can be measured by 1) the desire to expand the starter line into a system.

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24 Mark and Sharon Kelly Dorn, "Why Streetcars: The Role of Streetcars in Portland," (City of Portland, Bureau of Transportation, 2008), p. 8
25 Ibid, p. 18
2) the quantity of both existing and future development planned around streetcar; 3) the amount of increase in development density around streetcar; 4) the reduction in parking requirements in streetcar-serviced areas; 5) high and/or increasing ridership counts, and 6) a consistent "buzz" or publicity about the streetcar.

Portland's desire to expand its initial streetcar line into a network of urban circulators is proof that the mode is a success. As was previously discussed, the Streetcar System Plan, conducted by the Department of Transportation and supported by the Planning Department, is testament to the City's belief in streetcar to supply efficient urban transit in addition to serving as a catalyst and magnet for development.

City officials are not the only ones that recognize the success of Portland streetcar. The quantity of development that occurred around the first streetcar line in Portland as well as the proposed development that has been planned around the second Eastern Loop line is proof that developers are also believers in streetcar. As of April of 2008, "$3.5 billion has been invested within two blocks of the streetcar alignment, [including] 10,212 new housing units and 5.4 million square feet of office, institutional, retail, and hotel construction." Similarly telling, "prior to 1997, land located within one block of the streetcar alignment captured 19 percent of all development. Since the streetcar alignment was identified, 55 percent of all new development within the CBD has occurred within one block of the streetcar." This can be seen in Figure 2.12. Although it is difficult to determine whether this development occurred where it did because of the streetcar, or whether the streetcar was aligned to travel through the redevelop-

![Figure 2.12—Development activity within the Portland Streetcar LID, as of April 2004. Source: www.portlandstreetcar.org.](image-url)
Development district, it is obvious that the two are linked. Developers have shown that they want to market their projects as being accessible to the streetcar because of the amenity it is and the connections it provides to the city.

Primary examples of development that has occurred as a result of the streetcar include: the Pearl District, Museum Place (Figure 2.13), River Place, the South Waterfront, and the Brewery Blocks. In the Pearl District, what was once a setting of underutilized warehouses and vacant properties has “become a lively and intense mix of housing, employment and retail providing a major destination and source of riders for the Portland Streetcar.” Located further along the line near Portland State University and the cultural district near the Portland Art Museum, Museum Place includes an urban Safeway grocery store, low income housing, affordable housing, market rate housing, luxury condominiums, office condominiums, and renovation of the YWCA. Continuing south along the streetcar line, River Place was once an abandoned and contaminated rail yard and is now home to residential, hotel, and office products. At the southernmost turn-around of the streetcar is the South Waterfront Development. Before the recent economic slowdown, South Waterfront expected to reach full build-out in 2015 and expected to “bring 5,000 housing units and 10,000 jobs into the Central City along with a major river greenway and park, parking, emerging Oregon Health & Sciences University development, educational facilities and supporting retail goods and services.” The development’s well-positioned connection to Oregon Health & Sciences University and the streetcar will most likely prove to help it weather this financial storm.

28 “Community Building Sourcebook: Land Use and Transportation Initiatives in Portland, Oregon.”
29 “Portland Streetcar: Development Oriented Transit.”
Success can also be measured in the increase in development density that has occurred around the streetcar in Portland. New development since 1997 shows that within one block of the streetcar, projects are built to 90 percent of the allowable Floor Area Ratio (FAR), whereas development in the same areas before the streetcar only averaged approximately 35 percent of the allowable FAR.

Success can also be measured in the reduction of parking requirements that accompany the development along streetcar routes. Due to the streetcar, "developers are building new residential buildings with significantly lower parking ratios than anywhere else in the region."\(^{30}\) This allows developers to focus project financing and square footage on more profitable products, such as more residential units or more commercial space. The fact that these developments have sold and continue to be desirable urban products highlights consumer confidence in living in a place where more than one parking space per unit is not the norm.

Ridership is an excellent quantitative measurement of success and has been increasing steadily over the last eight years of operation. In the Fall of 2001, after the initial high ridership of the summer opening season, average weekday ridership totaled 3,715. This past winter, in 2008/2009, that number had increased to 11,802. Interestingly, the Saturday ridership is almost as high as the weekday ridership, a point that Patrick Sweeney says reinforces the "park once" philosophy. He believes that "people come downtown for their Saturday city experience, park once, and use the streetcar to get all around the downtown area." He also finds it telling that the weekday peak hours are not the typical morning and evening spikes, but rather around the lunch hour. People are heading out to run errands, make short trips and visit a different part of

\(^{30}\) Ibid. p. 2
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Figure 2.15—Streetcar daily ridership. Source: Portland Department of Transportation.
downtown for lunch during their breaks. Sweeney believes this really reinforces “the idea of future streetcar neighborhoods where people don’t need a car as much, thus building up more walkable neighborhoods.” Given the high and increasing ridership numbers for the starter line, it will be interesting to watch ridership numbers for future lines including the new Eastern Loop.

Lastly, although difficult to quantify, the constant buzz and publicity around Portland’s Streetcar system is a testament to its success. Known as a leader in public transportation in the west, it often sets the standard that other cities seek to emulate. It is the example that advocates use when trying to convince other cities about the benefits of and potential for streetcar in other places around the country, including Charlotte, NC, Columbus, OH, and recently Fort Worth, TX. Many newspaper and trade articles highlight the Portland Streetcar with titles such as Portland – The Streetcar Makes a Welcome Comeback, Cultured Pearl, and Still a Pioneer. Portlanders have gotten used to people, often city officials from across the country, visiting just to ride the streetcar and rarely blink at excessive photographs of the rails, the centenary wires, or the vehicles. In general, press is positive and helps to reinforce the streetcar as an iconic part of Portland.

In conclusion, there are many lessons that Denver could take away from Portland’s experience with streetcar. The most important points, however, include the fact that streetcar doesn’t simply provide transit riders with a convenient mode of travel through the city. It acts to both spur and attract development in the city, and thus allows the City to better manage and direct future growth. Importantly, this future growth can be less car-reliant and can increase neighborhood walkability. In directing this future growth,

SUMMARY

31 Interview with Patrick Sweeney, Portland Department of Transportation.
growth, Portland has also proven to be a leader in its Streetcar System Plan, using both transportation professionals as well as citizens to best recommend where in the city the streetcar network should expand.


Interview with Carl Abbott. In-person interview, Jan 12 2009.


Interview with Patrick Sweeney, Portland Department of Transportation. Telephone interview, March 13 2009.


Seattle's experience with modern streetcars sheds light on three key points. First, Seattle is very specific about its goal to use the existing and potential streetcar lines and corridors to connect (or reconnect, as the case may be) urban neighborhoods to the central downtown. Related to the first takeaway, the city believes that by creating a network of streetcars that tie into their other modes of transit, they can better compete for large employers and create a very attractive place for people to call home. Lastly, Seattle is, and has been from the beginning, interested in a interconnected streetcar system, not just one line. Before the first, and currently the only, streetcar line
opened, there were plans for a streetcar network. They were able to do so partially because of Portland's example and subsequent system planning. Only the future can tell whether planning a system so early in the transit mode's reintroduction in Seattle will in fact lead to a well-functioning system that meets the city's goals.

Seattle's original goals for the South Lake Union Streetcar line were to "provide local transit service, connect to the regional transit system, accommodate economic development, and contribute to neighborhood vitality." The goals that exist today are not only for the South Lake Union line, however; but set goals for a total streetcar network. According to a recent Network Development Report by the Seattle Department of Transportation, successful streetcars will:

- serve existing and emerging "main streets" of neighborhood business districts,
- serve important destinations/attractions,
- enhance the pedestrian environment,
- share street space successfully with bikes, and
- link major transit modes/hubs.²


Ethan Melone, the Streetcar Program Manager with the Department of Transportation, agrees that streetcars in Seattle are meant to serve the city’s central neighborhoods, focusing on shorter trips than the city’s up and coming light rail system. Melone also thinks the streetcar “provides a kind of premium level of service and a different experience for the transit rider than buses.” If Seattle can accomplish the original goals and meet the expectations for successful streetcar lines, the city could begin to function as a series of linked neighborhood districts, each with a distinct and yet comfortable urban character.

THE ROUTE

The existing South Lake Union Streetcar is a 2.6 mile loop that connects commercial, medical, residential, and open space land uses. Compared with Portland’s first streetcar line, the South Lake Union line initially relies more on commercial and office development, although there is residential development planned for later stages. The Pearl District in Portland is largely residential and retail, whereas currently the South Lake Union area is focusing on medical, office and commercial space. The Seattle Streetcar webpage boasts that “Seattle’s first new rail line in more than 25 years . . . connects Seattle’s growing South Lake Union and Denny Triangle neighborhoods and waterfront park to the vibrant downtown retail core.” Although it only takes passengers 1.3 miles out of the downtown core, the streetcar route travels just far enough into a previously underdeveloped district to generate and support new jobs and housing units. Those new jobs are, in part, provided by the relocation of Amazon.com’s headquarters to the district, which could bring as many as 6,000 jobs to Seattle.

3 Interview with Ethan Melone, Seattle Department of Transportation, Telephone interview, Mar 24 2009.
Figure 3.4—South Lake Union Streetcar map. Source: Seattle Department of Transportation.
Currently, the major destinations and activities (and thus ridership generators) along the short line include: the Fred Hutchinson Cancer Research Center; the University of Washington Medical Center; the Pan Pacific Hotel and accompanying retail (including a Whole Foods Market); the Seattle Children’s Hospital Research Institute, and the Westlake Transit Station, the city’s new sub-grade multi-modal transit hub. At the Westlake Station, the streetcar route connects with bus routes, light rail (opening two lines this summer and winter), and the Seattle monorail. The streetcar makes 11 stops and takes approximately ten minutes to travel from downtown to the northern-most stop at Fairview and Campus Drive, slightly east of South Lake Union. A map of the streetcar route is shown in Figure 3.4.

PLANNING PROCESS

There were two keys to the realization of the Seattle streetcar, both of which played a major role in the planning process. The first was the living-proof example of Portland’s first streetcar route, only 175 miles away. The second key element was the election of Mayor Greg Nickels. He followed the Portland Streetcar developments closely during his time as a Seattle City Councilman and was a member of Rail-volution, an annual conference “for passionate practitioners - people from all perspectives who believe strongly in the role of land use and transit as equal partners in the quest for greater livability and greater communities.” Mayor Nickels was the champion and the Portland Streetcar was the poster child. The Department of Transportation led trips to Portland to ride the streetcar, allowing people to ride the route and better understand it for what it was.

6 “Rail-Volution Homepage,” http://www.railvolution.com/about.asp.
7 Interview with Ethan Melone, Seattle Department of Transportation.
Mayor Nickels' agenda in 2006 was heavily intertwined with the goals for the streetcar project. On the agenda, next to "build a streetcar;" was "attract biotech and other jobs, encourage development of housing for a range of incomes, create a new waterfront park, improve the Mercer Corridor, and build infrastructure for new jobs and housing." His goals for the streetcar project were to "provide local transit service, connect to the regional transit system, encourage economic development, and help create vibrant neighborhoods." There was a small study done to determine the best alignment for the new mode of transit and the first rail project for Seattle in a quarter of a century. Subsequently, the Office of Policy and Management put out a report detailing the Capital Financing, Operations, and Maintenance for a streetcar to run between downtown and South Lake Union. This area was slated for redevelopment, given its underutilized properties and close proximity to downtown Seattle.

An interesting component of the process was the involvement of Vulcan Real Estate, owned by former Microsoft co-founder Paul Allen. Vulcan owns much of the land in the South Lake Union redevelopment area and was instrumental in supporting the idea of a streetcar linking the area to downtown. They also gathered the momentum necessary to make the project financially feasible by supporting the LID that would go on to fund half the cost of the streetcar line. There has been some question of the multi-faceted relationship between the city and Allen. He owns three of the city's major sports teams and is heavily involved in its real estate market. To say that he doesn't have any effect on development, and thus how public funds are spent on development-related projects, would be false. Melone framed the context carefully and fairly, stating that due to the

8 "South Lake Union Streetcar Factsheet," (Seattle: Dept of Transportation, 2006).
9 Ibid.
development potential along the route, "there was an opportunity to form an LID and serve as a catalyst for launching a modern streetcar system, by having some funding commitments through those property owners." As was the case in Portland, and will be the case with streetcar projects moving forward, the private sector plays a major role in making these expensive infrastructure projects possible.

The formation of the LID that supported the streetcar financially (and the determination of the level of support it would give) was made easier due to the smaller number of property owners along the route. Property owners, including Vulcan, agreed to assess themselves a tax based on the forecasted business that the streetcar would bring their district. A study by Peter Shorett in 2002 "concluded that the increase in property value due to the streetcar would be in excess of $25 million, and therefore, an LID could be feasible." Property owners in the district formed a group called Build the Streetcar, and helped finalize the formation of the LID that would contribute, in the end, $25.7 million dollars towards the capital costs of the streetcar.

Finalizing the planning process, analysis was conducted to determine the exact alignment from downtown to South Lake Union. At this stage, it was important to highlight the streetcar's connections to downtown Seattle and its many modes of transportation. Figures 3.5 and 3.6 show the multiple bus routes, future light rail connection, monorail connection, and areas of strong pedestrian character.

10 Interview with Ethan Melone, Seattle Department of Transportation.
11 "South Lake Union Streetcar Capital Financing and Operating and Maintenance Plan."
Figure 3.5—South Lake Union Streetcar proposed route and station locations. Source: Seattle Department of Transportation.

Figure 3.6—South Lake Union Streetcar transit connections. Source: Seattle Department of Transportation.
On December 7th of 2007, the streetcar began operation to South Lake Union from downtown Seattle. Only months after opening day, the Seattle City Council voted to study future streetcar routes to create a network. From the resources available online and the interviews conducted, it is difficult to determine the level of public involvement in the first route's planning process, let alone the process that is being used to determine the future network. Compared with the Portland System Plan process, Seattle seems to lack adequate public involvement that might garner more support for the system in the future. The network-planning project is discussed further below in *The Future of Streetcars in Seattle*.

### FINANCING AND OPERATIONS

Financing Seattle's first streetcar route involved a creative combination of federal and state grant money, tax revenue from the South Lake Union LID, and income from city-owned property sales. The city was proud of the fact that they did not use any money from the City of Seattle's General Fund in the development of the line. The total cost of the system was $52.1 million. As was mentioned earlier, the property owners along the proposed route funded $25.7 million or 49 percent of the cost of the system through an LID assessment. The remaining $26.4 million included $14.9 million in federal grant money, $3 million in state grants, and $8.5 million in proceeds from an innovative city property sale. The city was able to transfer the air rights or development rights to the space above the maintenance facility for the streetcar line. The development rights to this space were transferred (sold) to developments in the area, which were subsequently allowed to increase the total square footage or number of residential units they could build, thus increasing their returns on the project.
In Seattle, 70 percent, or $36.7 million of the total budget for the Southlake Union Streetcar line went to pay for construction of the line and the maintenance facility. $9.2 million was spent to purchase the three streetcar vehicles, which were manufactured by Inekon/Skoda in the Czech Republic. The remaining $6.2 million was spent on planning, design, and environmental review.

The total cost per mile of the South Lake Union streetcar, including the cost of planning, design, construction and the three vehicles, was $40 M. The Seattle Streetcar website also highlights the cost of the line per mile of construction cost (not including planning, design, or vehicle purchase) at $28.2 M per mile, including the cost of the maintenance facility. If the maintenance facility is not included, the cost per construction mile drops to just under $25 M per mile.

The regional transit provider, King County METRO, manages operations for the South Lake Union streetcar line and all future streetcar lines in the network. Although the streetcars are city-owned, an intergovernmental agreement allows METRO to operate and manage the streetcars. The streetcars currently run from 6:00 am to 9:00 p.m. on Mondays through Thursdays, 6:00 am to 11:00 p.m. on Friday and Saturday, and 10:00 am to 7:00 p.m. on Sundays and holidays. In order to meet the goals of the Department of Transportation’s Seattle Transit Connections program, the streetcars will have to operate a minimum of 18 hours per day in order to provide connections to the “urban villages” outlined in the program.

12 The maintenance facility cost $4.3 M but will also serve future connected streetcar lines.
Figure 3.7—The NextBus web application allows passengers to see the real-time streetcar location via a computer or a cellular device. Source: NextBus.

Funding for the day-to-day operations of the South Lake Streetcar currently comes from a combination of sponsorships, redirected regional transit funding, and streetcar fares. It is estimated that the cost of operation and maintenance for the line will be $2 M per year; and that sponsorships can cover $500,000. Sponsorships include advertising in the streetcar vehicles, on the vehicles, and at the streetcar stops. The regional transit funding that will supplement the operation costs will be available when Seattle's first light rail line opens. The opening of Sound Transit's LINK system will replace certain bus routes, whose funding sources will be redirected to the streetcar. Again, the city is proud of the fact that they do not plan to use money from the City's General Fund to operate or maintain the streetcar; but are financing it through other avenues.¹⁴

Fares for the Seattle Streetcar are $1.75 per adult, $0.50 for youth aged 6 to 17 and seniors over 65, and free for children under 5. METRO transit passes, as well as the Pugetpass or a bus transfer is valid fare on the streetcar. Passengers can purchase tickets for the streetcar at various local shops, hotels, and on-board the streetcars themselves. Seattle has also programmed their electronic ticket-dispensing parking meters to dispense streetcar tickets upon purchase.¹⁵ Seattle's streetcars have a GPS tracking system similar to that of Portland. Riders can use the internet or cellular phones to track the exact location of the cars and plan their exit/wait time accordingly, as seen in Figure 3.7.

¹⁴ Ibid. Costs and Financing FAQ page.
¹⁵ Ibid. FAQ About page.
The future of streetcars in Seattle is dependant on many factors, including who the mayor is, the ability to fund such new lines, and the city's support for the idea. The research has shown that the city, with the Mayor's strong backing for streetcars, supports the idea of a streetcar network. But the cost and dependency on the Mayor's seat in office could test the realization of such a network.

Seattle is not short on planning for a comprehensive streetcar network. The Network Development Report, released in May of 2008, envisions a network that

would provide new urban mobility options that would enhance the city and regional transportation system while shaping and supporting continued economic growth. The network would serve and encourage a broad variety of work and non-work trips and greatly expand the ability to live and work without using an automobile in the areas it serves and connects.\textsuperscript{16}

It is explicit in its goal to reduce automobile usage for localized trips in the city by enhancing the overall regional transportation system with streetcars. They also recognize the importance of transit and economic growth working in tandem.

The city is seeing momentum gather for the network concept. In a press release from the Mayor's office in December of 2008, City Councilmember and Transportation Committee Chair Jan Drago pointed out that

\textsuperscript{16} “Seattle Streetcar Network Development Report.” p. 1
one year ago we opened the South Lake Union Streetcar line. One month ago voters approved the First Hill line as part of Sound Transit Proposition I. And Monday the City Council voted to pursue more lines. Momentum is really building for the network and I am so excited to see it happening. 17

The mayor was also looking ahead, noting "a Seattle streetcar network will be an important part of [the city's] future, offering a climate-friendly transportation choice that helps attract employers and encourages more job creation." 18 The city is aware of the fact that a strong streetcar network could attract employers that are hoping to boost their sustainability image. These are companies that want to market the fact that they are taking measures to reduce their company's carbon footprint. By locating in a mixed-use urban setting with multiple transit options, employees have the ability to live in the suburbs and commute in by light rail or live in the city and ride the streetcar or walk to work. "Climate-friendly transportation," as Mayor Nickels called it, is a marketable amenity that a city can use to make itself more competitive and attractive to companies that are looking to relocate or expand.

Ideas were in the works for a streetcar network even before the South Lake Union line had opened for business. In April of 2007, the University of Washington's Urban Form Lab produced a report for the Urban League and the Seattle Streetcar Alliance. The Seattle Streetcar Alliance is a community based organization that promotes the idea of a streetcar network and includes members of the public, private, and non-profit sectors in Seattle. The report studied potential revenue sources for operations

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18 Ibid.
and capital costs as well as completed a spatial analysis of the city to determine where
a streetcar network would be most successful. They studied the possibility of seven
different streetcar lines in the downtown neighborhoods and went on to suggest that
the lines should not be seen as individual entities but as a single system. The report
noted that

the different strengths presented by the different extensions, and
the need to consolidate already apparent public and private sector
support for the streetcar extensions, point to the need to conceive
of the extensions as one transportation system. This single streetcar
system will provide a linked, seamless network for the mobility of
riders and, ultimately, for serving all employees, residents, and visitors
of the various Seattle areas.\textsuperscript{19}

In conducting the spatial analysis, the Urban Form Lab identified thirteen indicators of
socio-economic strength. They proceeded to map each indicator using Geographic In-
formation System (GIS) data, highlighting the spatial needs and opportunities for street-
cars in Seattle. The thirteen indicators they identified were: 1) the potential for an LID,
as well as its size, 2) the terrain and slope, 3) the assessed property values, separated
out by the potential LID districts identified in the first indicator, 4) concentrations of
vacant and re-developable land, 5) residential density to generate ridership, 6) employ-
ment density to generate ridership, 7) properties with more than 500 employees that
might contribute to the system financially, 8) employers participating in the Commute

\textsuperscript{19} Anne Vernez Moudon and Mark Hallenbeck, "Financing Options for an Expanded Seattle Streetcar
System and Network" (Seattle: University of Washington Urban Form Lab and Washington State
Transportation Center, 2007).
Trip Reduction (CTR) program, 9) bus ridership, 10) the location of selected bus routes, 11) structured parking lot locations, 12) surface parking lot locations, and 13) parking meter zones in the city. Each mapping diagram and set of graphs provided data highlighting the strengths or weaknesses of the various lines. For example, Figure 3.8 details the residential density concentrations and highlights different areas than Figure 3.9 which details the employment density.

One of the key findings in the report by the Urban Form Lab was the conclusion that each proposed streetcar line could not be expected to fund itself individually, line by line. While some lines would be more financially productive than others, meaning that they would be able to support the cost of the line through a more robust LID or other financing techniques, the system as a whole would be more financially productive if all lines were operating. In this case, the study found that the whole system was greater than the sum of its parts.20

Moving forward from the report by the Urban Form Lab, Seattle's City Council passed the Seattle Streetcar Network Concept, or Resolution 31042, and granted permission to the Department of Transportation to study the network concept in more detail. This led to the Seattle Streetcar Network Development Report, referenced earlier. The report evaluated nine streetcar corridors and eventually narrowed the list to four suggested routes.

The routes were chosen based on seven different criteria. The first category was technical feasibility. Here, routes were eliminated that included terrain with a grade over 9 percent, had turning radii tighter than 60 feet, were not compatible with existing

20 Ibid.
traffic movements or existing trolley bus routes. The second category was cost, where the cost of the potential route was compared with the cost of other modes (trolley bus, bus, light rail, etc) as well as with other alignments. The third category was operating efficiency, where the route was evaluated on the service it would provide compared with other modes. The fourth criterion for evaluating each line was route structure and operating cost. Here, the line was analyzed based on the potential to absorb or replace existing service, such as bus routes, its potential connections to other modes of transit, and the current level of transit service provided to the area (to ensure providing service to areas currently under-served by transit). The fifth category was ridership potential and was based on the existing ridership in the corridor as well as ridership that would be generated by potential development. The sixth category evaluated the funding opportunities, including an assessment of property values, the opportunity to create LIDs, the potential to partner the project with other city projects, and possible institutional support. The final category outlined the community development opportunities for each line and highlighted the development capacity of the area as well as the pedestrian-oriented uses, activities, and amenities each area could provide.

The study also evaluated the more technical and design sides of planning the network. They developed a list of five alignment considerations, including the platform design, interaction with bicycles, interaction with automobiles, utility conflicts and the interaction with on-street parking. In general, Seattle has decided that when possible, a center-lane alignment is better due to its limited interferences with both bicycle lanes and automobile traffic. Again, the streetcar would still be traveling with traffic, not in a designated right-of-way, but would be aligned in the left lane of travel. Figure 3.11 details Seattle's study of various alignment options.
The network study also detailed different types of service levels that the routes could provide. The Main Street Service would serve commercial and mixed-use districts of medium to high residential and employment densities. In this level of service, travel times are slower due to the frequency of stops (which occur every eighth or quarter of a mile). The Express Service concept would be used to run through lower density areas, but then have the ability to provide a Main Street level of service when it arrived at major activity centers. The Transfer Service concept entails a transfer point, where two streetcar lines meet, but do not overlap. Passengers are required to transfer vehicles to continue on to their destination. The opposite of Transfer Service is the last type of service, called Inter-lined Service. In this scenario, it is not necessary for passengers to transfer vehicles because lines overlap on certain high-demand portions of the route. This service level is more convenient for passengers but is expensive to operate and may operate more frequently than is demanded. As long as the tracks at transfer points are connected, Transfer Service and Inter-lined Service can be adjusted to meet future and fluctuating demand, based on new ridership levels or even seasonal ridership variation.

The report even goes so far as to start to develop an identity for the four recommended routes. They have designed potential vehicle paint jobs and highlighted how each line would connect to the "Urban Villages." The Seattle Connections program seeks to connect all the identified urban villages with transit service every 15 minutes, 18 hours per day. The report recommends the following streetcar lines for Seattle in the near future: the Central Line, the Fremont/Ballard Line, the First Hill/Capitol Hill.
line, and the U-Line, which would be an extension of the existing South Lake Union line. The routes are highlighted in Figure 3.11.²¹

In general, streetcar planning in Seattle is not lacking. In fact, it can be overwhelming to consider the amount of planning they have done. However, the city has weighed the option for different types of transit modes and has determined that streetcars are the best fit for the city. When the capital facilities cost per mile is calculated, based on the useful lifespan of the infrastructure, the cost of the fleet, the useful lifespan of the fleet, and the cost to operate the system, streetcars come out ahead of trolley buses, as seen in Figure 3.12. This is also true of their operating costs, in comparison to an electric trolley bus, shown in Figure 3.13. Despite the support for and proof of the network’s promise, there are barriers to the development of a streetcar network in Seattle. These barriers include the dependency on Mayor Nickel’s support. If he is not reelected, the city could choose to focus on other modes of transit. The other barrier to a network is the inconsistent methods for funding streetcars that often rely on strong development potential. Given the current economic condition for commercial development projects, the network may need to wait until the next positive real estate cycle to become a reality.

²¹ “Seattle Streetcar Network Development Report.”
## Figure 3.12—Comparisons of alternative transit investments by capital facilities costs. Source: Seattle Streetcar Network Development Report.

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<th>Transit Type</th>
<th>Capital Facilities-Cost per Mile ($2010)</th>
<th>Useful Life (Years)</th>
<th>Fleet Purchases (Per 2007)</th>
<th>Useful Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streetcar</td>
<td>$30-$45 M</td>
<td>40+</td>
<td>$3 M</td>
<td>30+ years</td>
</tr>
<tr>
<td>Electric Trolley Bus²</td>
<td>$7-8 M</td>
<td>Paving-10+ years; Systems-30+ years</td>
<td>$1 M</td>
<td>12 years</td>
</tr>
<tr>
<td>Light Rail</td>
<td>$100-$160 M</td>
<td>60+ years</td>
<td>$4 M</td>
<td>30+ years</td>
</tr>
</tbody>
</table>

## Figure 3.13—Comparisons of alternative transit investments by operating costs. Based on 2010 dollars. Source: Seattle Streetcar Network Development Report.

<table>
<thead>
<tr>
<th>Operating Cost/Revenue Hour</th>
<th>Electric Trolley Bus</th>
<th>Streetcar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Cost/Revenue Hour</td>
<td>$130/hour³</td>
<td>$160/hour⁴</td>
</tr>
<tr>
<td>Average Farebox Recovery</td>
<td>40%/⁵ or $50/hour</td>
<td>50%/⁵ or $80/hour</td>
</tr>
<tr>
<td>Sponsorship Program</td>
<td>$25/hour⁷</td>
<td></td>
</tr>
</tbody>
</table>

**Net Operating Cost**

| Electric Trolley Bus       | $80/hour |
| Streetcar                  | $55/hour |
While Seattle's first streetcar line opened in December of 2007, only a year and a half ago, there are still ways to measure the success of the system. It is possible to analyze the economic development that has occurred around the streetcar route, the ridership levels that the streetcar has generated, the amount of planning that has occurred to extend the streetcar network, and the identity it has brought to the city.

Although Seattle's Department of Transportation does not explicitly document the amount of economic development that has occurred due to the streetcar in the same way that Portland has, they keep an eye on it. It is also difficult to say whether the streetcar project occurred due to the planned development, or the development was helped along due to the streetcar. Because streetcar projects are so intricately woven in with economic development projects, it is difficult to separate cause and effect. It will be interesting to see how the development and construction activity around South Lake Union weathers the current economic downturn given the fact that the commercial real estate markets have been hit particularly hard. The outcome of the development in the area will prove whether or not a streetcar is enough of an amenity and attraction to soften the shock of the downturn.

Seattle's Department of Transportation does closely monitor the streetcar's ridership levels, and is using them as a quantitative measure of success. They exceeded their first year ridership forecasts by approximately 30 percent. According to Ethan Melone, they have "day-of-week, time-of-day, and even seasonal variations in the peaks" for the South Lake Union line. He notes that summer ridership tends to be higher than other seasons, particularly on the weekends. He believes that when the South Lake Union...
A third measure of success is the volume of planning that has occurred to increase streetcar service in Seattle. The multiple planning reports and studies that have been completed are a testament to the success of the first line. Melone notes that “even as we start planning for the First Hill Streetcar line, there are a lot of different neighborhoods along the alignment or the potential alignments that are competing to have the streetcar serve them.”

Seattle’s first streetcar line can be deemed a success because they are planning for future streetcar lines in the city, both because individual neighborhoods want that specific level of service and because the city believes it will help to secure their regional competitiveness.

Lastly, the success of the South Lake Union Streetcar line can be measured in the identity it creates for the district. One reporter noted that it gives the district a “classy image,” and it is promoted on hotel, conference, and tourist information sites. A surefire determination of success for any transit project is, of course, the trendy T-shirt. Destee-Nation Shirt Co., a company that “collects authentic T-shirts from cultural icons and independent businesses along the West Coast and Hawaii” is selling a Seattle Streetcar T-shirt, as seen in Figure 3.14. Although a T-shirt is not to be used as proof that a $52.1 M project is a success, it is proof that the system is a part of the culture of the neighborhood and the city.

22 Interview with Ethan Melone, Seattle Department of Transportation.
23 Ibid.
Only time will tell the true success of Seattle's modern tram system. Currently, the city believes that a streetcar system (not just a single line) can reconnect their downtown and make them a competitive city in the region. This is the driving force behind their streetcar's initial success and planned expansion. Denver could use Seattle's route planning process and their strong belief in streetcars as a viable development guide and transportation provider as an example when exploring the mode for the Mile High City.
REFERENCES


Interview with Ethan Melone, Seattle Department of Transportation. Telephone interview, Mar 24 2009.


"Rail-Volution Homepage." http://www.railvolution.com/about.asp.


Before understanding Denver’s present land use and transportation conditions, it is both important and interesting to understand its transportation past. Although growth in the Denver metropolitan area has been one of a typical western American city, plagued with sprawling single-family developments and increasing congestion, that was not always the case. More importantly, if the current planning projects and resulting recommendations are successfully implemented, Denver could set the standard for the best way to manage, direct, and support growth in a city.

DENVER’S WESTERN ROOTS

Late in the summer of 1858, small amounts of gold were found at the junction of Cherry Creek and the South Platte River in the heart of what would become Denver, Colorado. Various different settlers from Kansas surveyed land leading up to the winter
of 1858, but the settlement that remained come spring was that plotted by Samuel Curtis and James S. Lowry. The name for the new town came from that of Governor James W. Denver of the Kansas Territory who granted the settlers the right to claim land. The primary settlement was plotted north of Cherry Creek and just east of the South Platte, but another settlement took root to the south of Cherry Creek. The Auraria Town Company laid out the street grid at a slightly different angle than that of the Denver Town Company, making for odd intersections along Cherry Creek. Yet another settlement was plotted out across the Platte River to the west. Slightly uphill from the others, this area would be known as Highlands and developed more slowly until bridges could be constructed. These three settlements can be seen in Figure 4.4. Although the prospect of gold attracted many to the base of the Rocky Mountains, it was a false alarm. When gold was found in the mountains, however, Denver became the hub for miners, either on their way to make it rich or as a respite from the harsh mountain winters.

As the settlements grew and the plots of land were built with cabins and homes, Denver and Auraria became rivals. Georgians, known to be supporters of slavery, settled Auraria, whereas Denver was settled by people from Lawrence, KS, the hub of the free-state movement in Kansas. In 1860, however, all three towns, including Highlands came to an agreement and consolidated to form Denver City. A year later, Colorado was made an official territory. Denver and Golden, a settlement closer to the mountains and thus the mining action, fought for the title of capital of the territory. Due to its accumulation of governmental buildings and mining-related manufacturing, Denver remained the stronger city. Thus, when statehood was granted in 1876, Denver became the official capital.
It wasn't until 1870 when the first railroad laid tracks to Denver. The Denver Pacific Railway connected the Queen City, as it was called, to Cheyenne Wyoming. Soon after, the Kansas Pacific Line connected Colorado eastward, and the Denver and Rio Grande line connected the city to southern settlements such as Pueblo. These railway connections solidified Denver as a legitimate western city and the population boomed. With population growth came more land speculation on the fringe of the original land surveys and Denver's borders were ever increasing. The downtown area grew upwards at the original junction of Cherry Creek and the South Platte River, but the trend in Denver was, and still is, to grow outward. This is apparent in Figure 4.5, a map of the downtown in 1871. In 1880, the population was estimated to be approximately 36,000 people, and by 1885 it had doubled. In order to house all the new residents, street railways provided transportation from outlying neighborhoods to the downtown. By 1885 Denver had 46 horse-drawn streetcars pulled by a fleet of 230 horses. These streetcar lines were built by multiple companies, some banking on pre-existing neighborhoods such as Highlands and Auraria. Real estate speculators who provided housing along the streetcar routes also helped to finance the transportation that made their developments accessible. The development and the new streetcar lines worked in tandem to provide Denver with one of the most extensive streetcar systems in the United States at its peak.1

DENVER'S STREETCAR ORIGINS

By 1901, the Denver City Tramway Company (DCTC) had purchased the many independent streetcar lines in the city, including the Denver City Traction Company and the Denver Consolidated Tramway Company. As the authors of Denver's Street Railways title it, this was the beginning of "the Golden Era." In 1900, the census counted 133,859

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Figure 4.6—1901 Denver City Tramway Company Map. Source: Denver’s Street Railways, vol. 2.
people in Denver and ten years later, there were 213,381—an increase of almost 65 percent. Denver was not only home to mining equipment manufacturing, but food processing and a burgeoning health-care industry. Denver’s arid climate proved to be excellent for treating tuberculosis and many such clinics opened throughout the growing region. It was in this first decade of the twentieth century that Denver was to “lose most of its frontier aspect. This change was partly accomplished by the construction of new iron-framed, high-rise buildings in the downtown business section of the city. Residential areas were expanding with modern houses, pleasant neighborhoods, and tree-lined parkways.” These streetcar suburbs followed and spurred development to the south, southeast, north, and northwest of Denver’s city center, as can be seen in Figure 5.7 a map of the streetcar routes in 1901.

One such neighborhood that developed with the help of the streetcar was University Park, just to the east of Denver University. In November of 1899, William S. Iliff, A.J. Doud, A.J. Fowler and John D. Allen incorporated a new streetcar line to run from S. Pearl and E. Jewell, a terminus of the Denver City Tramway Company’s South Pearl line, further east to Evans and Milwaukee. The four men were real estate investors and saw the potential in the fact that the Denver and Sante Fe Railroad was no longer operational on Evans Street, but that the existing (and potential) residents in the area still needed access to downtown. Thus,

> the University Park Street Railway became an immediate success, not only with residents along Evans Avenue, but also with residents of University Park... It cut travel time between University Park...

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and Denver to at least 15 minutes less than on the [Denver City] Tramway's University Park line.\(^3\)

By 1900, the DCTC purchased the line from the developers to absorb it into their system.

Not all lines were welcomed additions to the city, however. As is the case with retrofitting transportation lines in existing cities today, there were conflicts with the location of new streetcar lines that passed through existing neighborhoods. For example, when the DCTC wanted to extend their 11th Ave. line in 1901, there was so much resistance from the neighbors along the proposed route that the extension was rerouted. "The residents on Gaylord Street put up such a fight against streetcars running in front of their houses that the Tramway was forced to build the connecting track linking East 13th Ave. with E 12th Ave on Vine Street, one block west of Gaylord Street instead."

Similarly, in 1902, the DCTC wished to provide a north-south connection in the city without having to force passengers to come into the central city first. They proposed a route that would connect 17th Avenue to 6th Avenue along Clarkson, but met so much resistance that they proposed the route to go south down Corona and north up Downing. This too was met with opposition such that the Company proposed the route on Marion and Humbolt Streets. After so many complaints from such an organized neighborhood, the route was shelved until the following decade.

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3 Ibid. p. 28
4 Ibid. p. 63

Figure 4.7—A newspaper advertisement for the Denver City Tramway Company. Source: Denver’s Street Railways, vol. 2.
Development continued outward from the core of the city and corresponded with Governor Speer's City Beautiful projects. Speer's dedication to create city parks, parkways, and monuments in Denver created some of the most beloved neighborhoods in the city today. In 1904, the Tramway Company linked Washington Park, the city's newest park, with the downtown. At the time, it appeared to be nothing more than sparsely populated prairie. The streetcar line spurred the development of the small brick bungalows that are still prominent in the neighborhood today.

In 1906, the DCTC faced controversy with their franchise agreement and their right to operate the franchise was put to public vote. Passing by a mere 183 votes, the company was allowed to continue operation for 20 years given certain agreements. An agreement was reached whereby the DCTC's new franchise would pay the City and County of Denver $5000 per month during the life of the franchise, or a total of $1,200,000, construct a number of extensions on existing routes; extend the 16th Street Viaduct and make other infrastructure improvements to the system, and replace any remaining cable car tracks with the proper gauge streetcar tracks. They agreed to build the extensions and new lines at a rate of 10 miles per year until they were complete, but an impending economic slowdown and a gradual increase in automobile usage impeded the plans. The extensions the company agreed to build were to bring transportation to a greater range of areas around Denver's center. It is difficult to tell from the images of new route construction, such as that in Figure 4.8, that there was a great need for more space. However, as soon as the streetcar arrived, homes were built and small commercial districts sprouted to support them. These commercial districts existed along popular routes and at the end of many of the lines.
Denver's streetcar system was so successful that the City hosted the American Street & Interurban Railway Association convention in 1909. This brought many streetcar builders, rail manufacturers, and operating company executives to town from across the country. By this time, Denver was operating a trailer system, whereby they would attach an extra trailer to the end of the streetcar vehicles during rush hours to meet the increased demand. It is interesting to note that many streetcar companies in the country began to operate trailers in 1910 and 1911, no doubt a result of learning of their success in Denver. The company was responsive to “pleas from neighborhood associations requesting the replacement of the 39 foot spliced cars with modern equipment, and the addition of trailer service on routes that were still served only by crowded streetcars during rush hours.” The trailers were operated by young gentlemen, typically college and older high school students. So many trailer hounds, as they were called, studied at Denver University that it was nicknamed “Tramway Tech.” After the convention, the DCTC built a new headquarters right across from their downtown hub, the Central Loop. The headquarters was, and still is, a stately building in the heart of Denver’s CBD that represented the successful transportation business they operated.

In the early twentieth century, the streets of Denver were vibrant corridors of activity, serving multiple uses. The mixture of streetcars, horse-drawn carts, automobiles, pedestrians, and bicyclists in the streets of downtown can be seen in Figure 4.9. It is also interesting to note that streets were still unpaved well into the 1910s. The hustle and bustle of the streets, however, began to cause problems, and by 1913, twelve busy intersections were stationed with traffic control agents at peak traffic hours. In summer, the

Figure 4.9—The mix of streetcars, bikes, pedestrians, cars, and carriages on 16th Street in 1911. Source: Photo by L.C. McCure in Denver’s Street Railways, vol. 2.

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5 Ibid. p. 184
busiest lines were those that traveled to Denver's great parks, and the two amusement parks. Surprisingly, "during the summer, Sundays had always been the busiest day of the week, with trolley cars and streetcar-trailer trains carrying people to and from church, then to such resorts as Manhattan Beach (Sloan's Lake), Elitch's Gardens and White City (Lakeside), as well as to City, Berkeley and Washington parks." The Tramway Company also began to experiment with more progressive operations for rush-hour streetcar demand, including the skip-stop method. This technique, whereby streetcars stopped every stop during peak hours, was tested on routes such as Colfax, but was not appealing to riders and was not instituted system-wide.

It was between 1912 and 1915, however, that the DCTC began to show the first signs of decline. Denver's population growth began to slow and with it, the growth and expansion of the Tramway Company slowed as well. At this time, automobile ownership and use began to expand beyond the wealthy and into the middle class populations. The Vice President and General Manager of the DCTC, John A. Beeler, conducted a survey in both 1914 and 1915 and found that passengers traveling by car to the central business district had increased by 50 percent, but streetcar ridership had declined by nine percent. Still, streetcars held the majority share of trips to Denver. In 1915, the survey counted all persons traveling in and out of the business district in one full business day, and found that out of a total 363,000 persons, 184,000 individuals rode Tramway cars—or 51 percent. The other 49 percent included: pedestrians living close-in—38 percent, travel via automobile—13 percent, those on bicycles—six percent, persons using motorcycles—one percent,
and finally, those who were on horseback or riding in horse-drawn private vehicles made up the last one percent.7

These ridership numbers, highlighted further in Figure 4.10, elicit mixed emotions for today's city planners. To think of a time when non-automobile trips accounted for 87 percent of trips is almost unthinkable, and would be impossible to achieve today. This ridership eventually generated enough streetcar traffic around the Central Loop that the DCTC responded to requests for another turn-around and the ability to spread out some traffic across more streets in the CBD. This led to routes up and down 17th and 18th Streets, leading to Union Station.

Despite increasing automobile use, the Tramway Company continued to improve operations. Between 1916 and 1920, free leaflets, called the Tram-O-Gram, were distributed on all inbound trains every other weekend. Although they provided light reading material for passengers, they occasionally even discussed pertinent facts about the Tramway Company itself, such as this comparison chart in Figure 4.11. They even detailed out where the company was getting its energy and how it was improving efficiency. In 1917, the company implemented the pay-as-you-enter (PAYE) system, and began to phase out the roaming fare-collecting agent. At some point, however, the tramway realized the connection between Denver's low-density development and land use, and their shrinking profits. General Manager Hild, in 1919 pointed out ... that the area within Denver's city limits was as large as that of Baltimore and Milwaukee combined, and that both of those cities had a much larger population. Yet despite this, Denver

Figure 4.11—The Tram-O-Gram discussed the details of the Tramway Company with riders in 1917. Source: Denver's Street Railways, vol. 2.

7 Ibid. p 224
had one mile of track for each thousand persons compared to only 0.41 miles per thousand in Milwaukee and 0.40 miles per thousand in Baltimore.8

The lower density land use pattern with the addition of private automobiles made the streetcar system financially unsound. Although new streetcars were purchased in 1922, the last new streetcar line was constructed in 1923. The rails had run their longest course. The extent of the streetcar system, totally over 300 miles of track, is shown in Figure 4.13.

The DCTC began its steady decline in the late 1920s during a rough decade. The official high point in equipment totals, track miles, and service was in 1927. Just one year later, buses were slowly introduced to certain DCTC routes. Originally seen as ways to direct riders to streetcars, the buses soon began to take passengers away from streetcar lines. For the most part, however, ridership was lost to automobiles. The growth in auto ownership and the decline in streetcar ridership is shown in Figure 4.12. In 1929, to combat the company’s increasing debt, the DCTC increased fares to 10 cents per ride, canceled streetcar routes completely, and replaced others with bus service. Although City Council member Straub said, “we’ll always have streetcars here,” there were some who were skeptical. Streetcars were replaced with trolley buses starting in 1940 and were chosen over diesel buses because the DCTC was already heavily invested in the electrical infrastructure. Switching to diesel buses would have made obsolete property and capital investments that the company had built up over more than fifty years. During World War II, the transition to trolley buses was slowed 8 Ibid. p. 271-2

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Figure 4.12—Increasing car ownership compared with decreasing streetcar ridership. Source: Graphic by author; data from Denver’s Street Railways, vol. 2.
Figure 4.13—The tramway routes in 1926. Source: Denver's Street Railways, vol. 2.
by the War Materials Board, which prohibited conversions that would direct materials to non-wartime efforts.

By 1947, the war restrictions had been lifted and the DCTC went forward with more streetcar-to-trolley bus conversions. The company hired a consultant to determine the best strategy to provide transportation to Denver’s residents. J. H. Gauss was an engineer from General Electric who conducted an in depth analysis of the existing system. He was particularly interested in the system’s busiest lines: Route 14 out Colfax and the Route 3 down Broadway. Although Gauss liked the new models of streetcars that were on the market and thought they would help to boost ridership temporarily, he recommended that the company convert all the lines to trolley buses. Nearing the end of the streetcar era in 1949, twelve routes were still in operation, including those traveling on Colfax, Broadway, South Pearl, South Gaylord, Larimer; 34th Ave. and Cherokee Streets. Four inter-urban routes were still operational, taking passengers to Golden, Arvada and Leyden. However, ridership between 1945 and 1949 decreased fifteen percent, shown in Figure 4.14, and the decision was made to convert the system completely to buses. On June 3rd, 1949, the last streetcars made their way along the remaining track in Denver as a final salute.

The Denver City Tramway Company was instrumental in the foundations of Denver’s first ring of suburbs. A progression of the route locations and coverage can be seen in Figure 4.15, and the resulting influences on neighborhoods in Figure 4.16. This map shows the dispersed effect that streetcar routes and frequency had on the neighborhood development in the early 1900s. These neighborhoods still retain many of the characteristics that made them excellent streetcar suburbs, including a range of residential products, small local commercial centers, and major commercial corridors.
While the character of some corridors have changed due to the automobile, may areas retain their original character, such as Old South Pearl Street, Old South Gaylord, and areas of the Highlands. The original streetcar neighborhoods are some of the most desirable places to live in the city today, due to almost the same reasons that they were great neighborhoods in the early twentieth century: walkability, a strong neighborhood character, proximity to daily or weekly amenities, and proximity to Denver's downtown. The only thing missing today is the streetcar to connect them to Denver's well-used and growing rapid transit system.

The character of Colfax Ave. and Broadway St. has been altered due to the need to provide parking for commercial uses.
Figure 4.16—The effect of streetcar routes on Denver’s neighborhood growth.
Source: Graphic by author.
Before looking into the latest transportation projects that Denver is undertaking, it will be good to get a basic understanding of the city, its residents, its employees, and how it will grow in the future. Denver County consists of 154.9 square miles and is expected to increase the total urbanize area by 0.4 percent per year through 2030. There are 9.9 square miles of park space in the City of Denver, accounting for 6.4% of the land area, and the metropolitan region boasts some of the highest amounts of urban park space in the country.

The regional planning organization for the metropolitan area, the Denver Regional Council of Governments (DRCOG), projects that the metro area population will grow by one million people by 2035. For the City and Count of Denver, they estimate the population will increase 23 percent and employment to increase 40 percent by 2030. In Denver County, 45 percent of all residential units are in multi-family dwellings, and the distribution of existing and predicted residential density can be seen in Figure 4.17. The top employers in the metro region are the City and County of Denver; Denver Public Schools, the University of Colorado, United Airlines, the US Post Office, Denver Health Hospital, the University of Colorado Hospital, Centura Health, Frontier Airlines, and the University of Denver. The distribution of existing and future employment density can be seen in Figure 4.18.

10 This is lower than the regional average increase in urbanized area of 1 percent.
13 “Denver Regional Council of Governments Website:”
Figure 4.17—Existing and projected residential density in Denver. Source: DRCOG.

Figure 4.18—Existing and projected employment density in Denver. Source: DRCOG.
A brief window into how Denverites currently move about the city will give a better idea of how modern streetcars might fit in. As of 2005, 14,430,726 vehicle miles are traveled every day by automobiles in the metropolitan area. There are 325 lane miles of severe congestion, or 23 percent of the congested lane miles in the region. 84 percent of the population has good access to jobs by transit in the City of Denver, much higher than the average 30 percent for the metropolitan area. Sixty-four percent of people that live in the City and County of Denver also work within the county, while 41 percent of people that work in Denver live in the county. For the nine-county Denver region, the DRCOG estimates that the average trip to work will decrease from 10.7 miles to 10.2 miles by 2035. They also estimate that 43 percent of people working downtown will take transit in 2035, compared to 32 percent today.

All of this is to say that transportation will become an increasingly important part of the equation for many people in Denver and the metro area as they move about the region. The public transportation provider that is working towards this goal is the Regional Transportation District (RTD). It is funded by a 1 percent sales tax in the metropolitan region and serves a population area of 2.7 million people. It serves 40 municipalities in six different counties and two different city/county jurisdictions. They operate 94 local buses, 13 limited buses, 24 express buses, 18 regional buses, 5 different bus routes to the airport (SkyRide), six light rail lines, and the free 16th Street Mall shuttle bus. They operate 49,947,763 service miles annually, with average total weekday boardings of 313,590. The free mall shuttle downtown, which opened in 1982, serves 50,285 people daily. Light rail, which first opened for service in 1993, averages 55,717 boardings per day.

14 Severe congestion is denoted by 3 hours or more of slowed travel speeds.
Figure 4.19—Map of the projected FasTracks build-out. Source: RTD.
The first light rail line, the Central Line, operated from Broadway and I-25, through downtown to 30th and Downing, traveling along Welton Street. Since that year, light rail has expanded two times and has plans for much more extensive regional growth, as will be discussed below. The first extension to open was the Southwest corridor which continued the Central Line from Broadway and I-25 to Sante Fe and Mineral. The Southeast corridor was part of the region’s T-REX project and added 19.1 miles of light rail service from I-25 and Broadway to I-25 and Lincoln Ave. T-Rex was a major transit system improvement project that opened in 2006, 22 months ahead of schedule. In addition to the extensive light rail line, there were 13 stations, 34 light rail vehicles, and a new maintenance facility added to the system. It added one lane of travel to 17 highway miles on I-25 and I-225 and made many highway infrastructure improvements.

Major transit projects in the Denver region have almost been the standard for the past decade. When T-REX was complete, the next major project, FasTracks, was put to public vote. FasTracks is RTD’s 12 year comprehensive plan to build and operate high speed rail lines, expand and improve bus service, and create more park-n-Ride locations throughout the region. It will include 122 miles of new light rail and commuter rail, 18 miles of bus rapid transit (BRT) service, 57 new transit stations, an additional 21,213 parking spaces at park-n-Ride locations, and enhanced bus service throughout the region. According to RTD, the goals for the project are to:

- Provide improved transportation choices and options to the citizens of the District—additional transportation choices add to the region’s quality of life;
• Increase transit mode share during peak travel times—existing congestion during peak travel times of the day is frustrating for many drivers and is expected to worsen as the region grows;

• Establish a proactive plan that balances transit needs with future regional growth—the Denver metropolitan region is expected to grow from 2.6 million (2005) people to 3.39 million in 2025.

Denver’s residents supported the project when they voted for the 4-cent tax on every ten dollars in sales. In the past ten years, RTD ridership has increased 28 percent and people are realizing the direct and indirect benefits of having a well-functioning transportation system. The “climate” for transportation projects in Denver remains high, despite increasing costs for the build out of FasTracks.

EXTENSIVE PLANNING EFFORTS

Not only are Denver’s voters supportive of transportation projects, Denver’s extensive planning efforts in the last decade have realized the power of planning for both land use and transportation. The list of plans is long and there are many organizations involved in planning efforts. At the regional level, there is the DRCOG which has produced Metro Vision 2030. At the City and County level, Denver’s Comprehensive Plan 2000 took a serious look at where the future growth in Denver was headed. The master plan for the city called for further study into the relationship between land use and transportation, and so were the beginnings of Blueprint Denver. Further planning efforts included an update to the Denver Bicycle Plan (2001), the Denver Pedestrian Plan (2004), the Downtown Multimodal Access Plan (2005), and Greenprint Denver in 2006. Greenprint Denver plan helps to coordinate the multiple planning efforts in the city, including those effecting transportation, urban design, water and the environment, solid waste and recycling, energy and emissions, and the green building industry.
Most recently, Denver’s Public Works completed a Strategic Transportation Plan (STP) in 2008. Currently, Denver is in the process of rewriting their zoning code to better fit with the recommendations in Blueprint Denver. The following analysis will focus on the three plans that most carefully study the intersection of land use and transportation at the City Scale: Blueprint Denver, the Denver Multimodal Access Plan and the Strategic Transportation Plan. It will also touch briefly on the methodology behind the zoning code changes because they will be the result of Blueprint Denver when approved in 2010.

In 2002, Blueprint Denver was released to help guide growth in the city to places where growth could be accommodated. It is a collaboration by citizens, public officials and public agencies. The plan has four strategies, the first of which is to “direct growth to areas of change.” The plan characterizes areas of change as:

- Underutilized land near downtown and along the South Platte River;
- Areas undergoing positive change that is expected to continue;
- Areas adjacent to and around transit stations (both existing and planned);
- Areas along corridors with frequent bus service that can accommodate development, especially where there is potential for a pedestrian-friendly shopping environment; and
- Areas with special opportunities such as where major public or private investments are planned.

![Blueprint Denver](image)

Figure 4.20—Blueprint Denver, a land use and transportation plan. Source: City and County of Denver website.
This strategy to revitalize areas of change works in tandem with the second strategy: to preserve stable neighborhoods. Labeled “areas of stability,” these are places in the city that have already have a strong character and are successful districts, both residentially and commercially. They typically face two types of challenges, that of reinvestment and of character preservation. It can be difficult to coordinate reinvestment in a portion of the district, such as an aging commercial node, without changing its character. The second and third strategies of Blueprint Denver go hand in hand with modern streetcars. The third strategy is to provide multi-modal streets and the fourth is to include innovative transit options. By working towards multi-modal streets, Denver is placing more emphasis on pedestrians and cyclists, and less emphasis on single-occupant vehicles. Adding innovative transit connections to these multi-modal streets is a perfect recipe for modern streetcars.

Blueprint Denver references the historic streetcar routes of the city as prime places to direct future growth in the city. The overlap of areas of change and the historic streetcar routes can be seen in Figure 4.2. The infrastructure of commercial corridors or smaller commercial districts is already in place along many of the routes. Blueprint Denver also references the need for circulator routes. The plan is explicit in its call for circulator routes to meet transportation goals. They hope to develop new bus circulator routes for the neighborhoods surrounding all proposed rail stations. These circulator routes should serve as many of the neighborhoods surrounding the station as possible and provide high-frequency service to be competitive with driving to and parking at the station.15

15 "Blueprint Denver," (Denver: Community Planning and Development, 2002). p. 98-100
Figure 4.21—Comparison of Denver’s “Areas of Change” as labeled by Blueprint Denver, to the 1926 streetcar routes.
Source: Graphic by author.
Data from City of Denver.
Although the plan mentions them as potential bus routes, the success of the streetcar as a circulator in Portland proves that modern streetcars could serve these routes. Blueprint Denver goes on to suggest that Transportation Demand Management Associations could help to organize circulator service to limit automobile usage in areas of change. These associations could consist of local businesses and even neighborhood organizations.

The Downtown Multimodal Access Plan (DMAP) also discusses the synchronization of land use and transportation, focusing on the CBD. The plan looks at all modes of transportation in Denver’s downtown, including transit, automobile, bicycle, and pedestrian access. Released in 2005, this plan goes so far as to recommend a shuttle service that would link Union Station (and the C-line light rail service), the cross-town D-line light rail service, Civic Center Station, and the cultural district that includes the Denver Public Library, the Colorado History Museum, and the Denver Art Museum. The suggested route is highlighted in Figure 4.22. While studies leading up to the final DMAP document researched the potential for rail service, the final recommendation was for a shuttle service, similar to that on 16th street. DMAP based this recommendation in part on the projection that 16,000 people will travel into Denver’s Union Station during peak hours when FasTracks is complete. Of those commuters and passengers, 39 percent will continue their journey out of the CBD to their final destination. The remaining 61 percent have a primary destination in the CBD. They also project that walking will account for 39 percent of connections from Union Station to final destinations, the 16th Street Mall Shuttle will account for 29 percent of connections, a new shuttle could account for 27 percent of connections, and local bus service would provide the remaining five percent of connections. It is a bold statement, and one that favors studying the options for streetcar, to suggest that a new shuttle and the 16th
Street Mall shuttle would transport the similar numbers of passengers in during peak demand periods.\textsuperscript{16}

The most recent document that discusses the important coordination of land use and transportation is the Strategic Transportation Plan (STP). The STP takes an innovative approach to planning for mobility in the Denver region. For an agency that has long been concerned with improving the way vehicles move around the city, they have decided to concentrate on moving people, and will do so by analyzing twelve identified travel sheds. As Bill Vidal, Manager of Public Works, notes, "these study areas, defined by geographical boundaries, have characteristics and facilities serving similar travel patterns. By analyzing travel sheds rather than merely measuring demand on high-traffic corridors, the STP recognizes the importance of moving people, not just cars."\textsuperscript{17} The concept behind a travel shed can be seen in Figure 4.24. The STP makes another bold statement about mobility in the City of Denver aside from studying travel sheds and moving people. They have taken a stance not to widen any roads in the City to increase capacity, but will work towards providing more transportation options. This includes enhancing the bicycle and pedestrian networks and helping to coordinate improved public transportation options with RTD and other city agencies.

The STP acknowledges that a reliance on automobiles has resulted in significant problems for cities, employers, and residents. They note increases in urban sprawl, traffic congestion, the number and length of automobile trips, consumption of land for parking and roadways, safety concerns, community and environmental health impacts,

\textsuperscript{16} "Downtown Multimodal Access Plan," (Denver: City and County of Denver, 2005).

\textsuperscript{17} "Strategic Transportation Plan," (Denver: Public Works, 2008). p. 3
and health issues such as respiratory illnesses, obesity, and mental health.\textsuperscript{18} They are also very specific about the fact that a community's transportation choices will have direct impacts on families, work opportunities, and overall lifestyle. For this reason, their vision is to provide: a transportation system that is multimodal, safe, efficient, and reliable, connected, green and sustainable, and lastly one that supports a healthy, livable community.\textsuperscript{19} In addition to this vision, the STP recognizes the need for a multi-faceted approach to encouraging people to get out of their cars. These approaches include behavioral, operational, and physical strategies. To encourage behavioral changes, the plan suggests coordination with other government agencies and outside organizations to "study, educate, support and implement specific approaches to reduce single-occupancy vehicular travel."\textsuperscript{20} This would include supporting transportation management associations or organizations, sometimes referred to as TMOs. The operational and physical changes that the plan hopes to encourage include making the existing system function more efficiently and improving new city facilities. This would occur through ongoing maintenance of the existing system, linking bicycle and pedestrian networks, supporting transit, improving safety for all modes, and conducting major improvement studies.

The STP's twelve travel sheds cover a wide range of districts in Denver, which can be seen in Figure 4.25. They suggest the possibility of a circulator, and even mention the term streetcar, for two different areas outside of the CBD. The plan also recommends that the planned downtown circulator, mentioned previously in the DMAR be converted to a fixed guideway transit service in the future (post 2015). The first

\textsuperscript{18} Ibid. p. 13
\textsuperscript{19} Ibid. p. 14
\textsuperscript{20} Ibid. p. 18
a) Central Denver
b) Downtown
c) East Central
d) East Colfax
e) East Side
f) Gateway
g) Hampden
h) Northwest
i) River North
j) Southwest
k) Speer/Lee’s Ferry
l) West Side

Figure 4.25—The STP’s twelve Travel Sheds and three study project areas.
Source: Denver Public Works
Figure 4.26—The STP's Colfax Travel Shed Analysis Map. Source: Denver Public Works.

Figure 4.27—The STP's Leetsdale Travel Shed Analysis Map. Source: Denver Public Works.
suggestion for a streetcar-like circulator is in Travel Shed "d," along East Colfax Avenue, to occur before 2015. Shown in Figure 4.26, the travel shed focuses on Colfax Ave. and the surrounding east-west streets. The second suggestion for a streetcar or light rail corridor is in Travel Shed "k," along Leetsdale, shown in Figure 4.27. The individual analysis for each travel shed also highlights major investment corridors, along which redevelopment and improved transit service opportunities exist.

Lastly, Denver is currently rewriting their zoning code to fit with the goals of Blueprint Denver. While the draft for the new code will be released in late May of this year, the City has set up a website to present the first draft of the new code and to receive public comments. This new zoning code's website, www.newcodedenver.org, explains that the new code is organized around six different “contexts” derived from the existing and desirable characteristics of Denver's diverse neighborhoods. This context-based approach provides a broader range of zoning categories than is currently available and will guide more compatible future development. The New Zoning Code also uses a form-based approach that more clearly explains what can be built in terms of such things as building height and placement.\(^\text{21}\)

The six neighborhood contexts include suburban, urban edge, urban, general urban, urban center, and downtown. There is also a special context designation for other land uses, including industrial parks, campuses, entertainment or cultural spaces, and civic spaces. Three of the neighborhood contexts describe multi-modal transportation

and enhanced pedestrian spaces as a mainstay, including the downtown, urban center
and general urban contexts. Depending on the new zoning map, based around these
contexts, streetcar could easily fit any of these three contexts. I would also argue that
it could serve the urban context as well, if it is routed appropriately.

CONCLUSION

Denver’s long history and interwoven development with streetcars and its current
comprehensive planning efforts are directing the city to embrace transit options not
only for regional trips, but for local trips as well. As the STP is sure to point out, au-
tomobiles are not going to disappear from the Denver lifestyle. One example that
speaks to this fact is the recreational lifestyle that Denver supports. The outdoor
lifestyle attracts many people to the mountains throughout the week and during all
seasons, and for this reason, cars will always be a part of Denver’s mobility equation.
However, the increasing population forecasts, limited amount of space within the city,
and demand for improved transit all point towards providing good, local transporta-
tion service through neighborhood districts and to major destinations. The analysis of
where and how modern streetcars might fit into the Denver landscape can be found
in the following chapter.


"Old South Pearl Street: The History." http://www.oldsouthpearlstreet.com/hist_1.htm


The purpose of this research is to determine whether modern streetcars might return to the historic streetcar neighborhoods of Denver. Ultimately, a streetcar route or network of routes could return to Denver, as is shown below in the comparison of Denver to Portland and Seattle as well as in the research of Denver’s current streetcar initiatives. However, the purpose of a streetcar today would not be to supplement development at the edge of Denver, as it was in the early 1900s. Rather, it would supplement redevelopment in Denver’s urban neighborhoods. In order for a streetcar route to serve a historic streetcar suburb of Denver it would either have redevelopment...
potential or be located between major land uses or redevelopment opportunities such that the route passed through the historic streetcar neighborhood. To emphasize this finding, analysis is completed to determine the similarities and differences between Denver and the two case study cities, the current streetcar support or opposition in Denver, and lastly to hypothesize where in Denver streetcar routes might occur in the future.

It is useful to acknowledge the similarities and differences that exist between Denver and the two case study cities, Portland and Seattle, in order to determine the potential for streetcars in Denver. The cities are relatively similar in terms of their population, their residents' average age, and the high levels of college graduates. These similarities are highlighted in Figure 5.4.¹

<table>
<thead>
<tr>
<th></th>
<th>Portland, OR</th>
<th>Seattle, WA</th>
<th>Denver, CO</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>529,121</td>
<td>563,374</td>
<td>554,636</td>
<td></td>
</tr>
<tr>
<td>Median Age</td>
<td>35.2</td>
<td>35.4</td>
<td>33.1</td>
<td>35.3</td>
</tr>
<tr>
<td>Adults with College Degree</td>
<td>32.60%</td>
<td>47.20%</td>
<td>34.50%</td>
<td>24.40%</td>
</tr>
<tr>
<td>Mean Travel Time to Work (min)</td>
<td>23.1</td>
<td>24.8</td>
<td>24.5</td>
<td>25.5</td>
</tr>
</tbody>
</table>

Figure 5.4—Comparison of Denver to Portland, OR and Seattle, WA. Source: US Census.

¹ United States Census.
All three cities share many characteristics that make them appropriate for streetcar revival: expansive streetcar systems in the early 20th century, a mixture of under-used areas near successful districts in close proximity to the central downtown, a population that is interested in urban living, and strong, active proponents. The benefit of a pre-existing streetcar system means, in many cases, that the bones of walkable, dense development already exist. As Peter Park, the head of the Planning and Development Department in Denver likes to say, “embedded in the DNA of the city is an urban transit system that’s been paved over.”

In Denver, many of these districts have a range of housing options and create an interesting mixture of housing densities, from single-family residential neighborhoods to 4-5 story apartment buildings. Some historic streetcar districts are waiting for reinvestment while others have seen recent reinvestment and are successful neighborhood centers. Park describes these areas as “desirable places” that “help command and maintain strong residential property values.”

The second characteristic that spans the three cities may not be seen as a positive characteristic, but it does present many opportunities. Under-used areas near the city center or that abut more successful or long-standing neighborhoods in cities present the opportunity for redevelopment, and in this case, redevelopment that is supported by a streetcar route or system. Portland and their first streetcar line have taken advantage of the Pearl District, the River District, and the South Waterfront area, all previously underutilized locales that are now connected to the downtown and other neighborhoods. They are expanding on this potential directly east of downtown across the Willamette River. Seattle took advantage of the South Lake Union District and envi-

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2 Interview with Peter Park, Head of Denver Planning and Development Department, Telephone interview, Mar 26 2009.
3 Ibid.
sioned development that included office, retail, and residential uses and a more vibrant park space around the lake. They too are expanding on this tactic and planning more streetcar routes to benefit other downtown neighborhoods. Lastly, the relatively young populations in the three cities are interested in urban living, including amenities such as public transportation and proximity to activity centers. All three cities have seen a strong growth and revitalization in certain central downtown neighborhoods. These “trendy” areas typically have higher prices or rents than the rest of the city, less parking, and a minimum of one retail corridor or other destination within walking distance.

Portland and Denver share two other similarities that suggest Denver could successfully implement a streetcar system. Both cities have an existing light rail system that is both successful and currently expanding. The connections that Portland’s streetcar makes to the light rail lines are important linking points for both modes of transportation, but provide two different speeds and levels of connection: regional versus local connectivity. Denver’s neighborhoods that are currently not served by the light rail system could benefit from a more appropriately scaled transportation system that a streetcar line could provide.

Despite their many similarities, the three cities do have some significant differences. Portland is different from Denver in that the major high-end retail located within the city limits is downtown. In Denver, the high-end shopping district is located just over three miles southeast of downtown, in an area called Cherry Creek. Cherry Creek consists of a large high-end shopping mall as well as an outdoor shopping district, Cherry Creek North. Due to the success of this shopping area, downtown Denver will not, in the near future, attract more retail opportunities than Cherry Creek. This land use difference between the two cities, however, highlights a potential connection
that Denver could make with a streetcar system. Seattle is also different from Denver and Portland in that they opened their streetcar line before their light rail system. A minor difference, it is important to highlight given the longer timeline of planning and construction for light rail than for streetcar. Seattle is also different in that they currently operate a successful trolley bus system. Despite the trolley buses, the city chose to plan a streetcar route (and subsequently a system) to attract more development.

In general, the similarities that exist between Denver and the two case study cities point to the potential for Denver to operate modern streetcars throughout the city.

There has been a buzz in the air about streetcars returning to Denver for some time now. City Councilwoman Jeanne Robb has been promoting the idea of a streetcar traveling down Colfax Avenue, right through her City Council district. In 2005, she helped to sponsor the Denver Streetcar Network Conceptual Project Report. This plan not only suggests Colfax but South Broadway as great starter lines to an entire network. Also, the Director of Denver’s Planning and Development Department, Peter Park, is interested in seeing streetcars return to Denver. In 2006, Westword⁴ reported on the potential for streetcars to return to Colfax. Reconnecting America held one of their four national streetcar workshops in Colorado last spring. And finally, funding was secured to complete a feasibility study for a streetcar along the Colfax corridor, with an estimated completion in 2010. There is a buzz, to be sure; whether that buzz can turn into reality is the question.

It is a good sign for a streetcar revival in Denver that the head of the Planning and Development Department, Peter Park, is excited about the prospect of this tested transportation and economic development tool. He believes that when Denver lost the original streetcar lines, “it erased the collective understanding of the importance of creating a vanity around multiple means of transportation.”  

And although there is “trace evidence all over the city of these little commercial districts, [and] little main streets that people love,” that were developed around the streetcar, today they are accessed primarily by cars.

Although they may joke in the Planning Department that streetcars are Denver’s “NexTracks,” Park exudes confidence that streetcars would be appropriate for certain neighborhoods and along certain corridors in Denver. He notes Portland’s success as evidence that Denver could accomplish similar goals and thinks the city is ready to provide this kind of service. He believes streetcar lines could accomplish many things, from “creating a sustainable city to just creating a more vibrant urban life along [streetcar] corridors.” Although the City is very proud of its TOD station planning efforts that work in tandem with FasTracks, he sees “the next level of connectivity between destinations and new areas and existing areas of density” as a great opportunity for trams. He is a strong believer that the concept of a streetcar network fits in well with Blueprint Denver by “encouraging mixed-use and accommodating greater density.” He also believes that a streetcar is superior a bus for multiple reasons, including the quality of the ride, the reduced air and noise pollution, and the ability to attract more choice riders (those that have the choice to ride transit or drive). Park

5 Interview with Peter Park, Head of Denver Planning and Development Department.
6 Ibid.
is interested in streetcar routes along Colfax and also for the Downtown Circulator noted in the Denver Multi-modal Access Plan. He also sees potential along South Broadway. He thinks

Colfax would be a great re-start for [a] streetcar system, because there's a lot of land for redevelopment and a lot of land could be repurposed, and the rail and the streetcar running constantly could help create more investments there.

Additionally, Park is a proponent of form-based codes and was involved in the rezoning of Colfax as a Main Street Zone. This new zoning fits the idea of streetcar perfectly and allows for redevelopment along the Colfax corridor that is suitable for and supportive of a streetcar route.

Another person aware of the potential for streetcars along Colfax Ave. is City Councilwoman Jeanne Robb of District Ten. Although her original interest in streetcars was nostalgic, she now views a streetcar route as an economic development tool for her district and as a re-branding tool for Colfax Avenue. She mentioned that the Mayor of Denver, John Hickenlooper, is hesitant about streetcars for fear they don't recap their increased cost over buses, but she is very enthusiastic that the upcoming Feasibility Study will be able to provide the evidence in her favor. She helped to organize the 2005 Streetcar Network Conceptual Project Report and is also involved in the current Streetcar Feasibility Study, both discussed below. She believes a streetcar that traveled east on Colfax, south along Colorado Boulevard, and through Cherry Creek North before returning downtown would be a big success. She highlights the redevelopment opportunities along Colfax that could transform the street back into a great Main Street, including areas around the Bluebird Theater, the new Justice Center, the Lowen-
stein Theater redevelopment area, and National Jewish Hospital. She also believes that using a streetcar route to direct growth will help to preserve other neighborhoods, confirming Blueprint Denver’s Areas of Change and Areas of Stability strategy.\footnote{Interview with Jeanne Robb, Denver City Councilwoman, Telephone Interview, March 20 2009.}

The Denver Streetcar Network Report (DSNR) was completed in 2005 for the benefit of the City and County of Denver as well as real estate developers, neighborhood organizations, business owners, RTD, business improvement districts, and others. It was prepared by the Denver Streetcar Coalition, which is currently non-existent, although the report itself details the formation of such a group as a step towards making streetcars a reality in Denver. The study outlines seven key steps Denver needs to accomplish in order to develop a streetcar network. The first step advocates for the development of a streetcar network plan based on high ridership, transit-supportive land uses, connectivity to other transportation modes and nodes, and a high potential for property value appreciation and increased business activity. The second step would be to develop a cost estimate for the system, both for construction as well as operational and maintenance costs. The third step, according to the DSNR, is to recruit private and public support for the project to help form and fund the organization that is detailed in the fourth key step: form a non-profit entity, the Denver Streetcar Coalition (DSC). The DSC would help to organize and possibly fund the fifth step: to conduct necessary feasibility studies. The sixth step would be to secure funding for the project, and lastly, DSC would be converted into a non-profit contracting and financing agency to manage the streetcar and coordinate service with RTD. The report highlights a “base line” streetcar route, or starter route, as well as possible extensions and new lines in the downtown area, shown in Figure 5.5. The route is a large loop, and much
Figure 5.5—"Base Line" Conceptual Denver Streetcar Network with Potential Connections and Future Extensions. Source: the Denver Streetcar Network Report.
longer than typical modern streetcar routes in the US at 7.5 miles. As it is bi-directional, fifteen total track miles would be built for this starter line. The report anticipates that the streetcar would decrease the need for stops in certain locations for the 15 bus along Colfax Ave. as well as the 0 on South Broadway.\(^8\)

The DSNR details a list of potential financing sources for the construction and operation of a streetcar system. From the project itself, the streetcar system could generate funds through fares, structured parking revenue, naming rights, sponsorships, advertising space on vehicles and stops, as well as bulk pass sales. Public funding sources could come from the City’s General Fund, Incremental metered parking revenue, the Denver Urban Renewal Authority Tax Increment Financing, RTD, DRCOG Discretionary Federal Grant Allocations, the FTA’s grant programs, including Small Starts, and the US Department of Transportation Infrastructure Finance Innovation Act Program. The report suggests that private funding could be generated through private donations and an endowment, special assessment districts (such as BIDs or LIDs), and developer incentives. In general, the report is optimistic that a streetcar route and system are feasible, despite high capital and operational cost estimates.\(^9\)

Building on the DSNR, the Colfax Streetcar Feasibility Study (CSFS) will soon detail the true potential for the return of streetcar on Colfax Ave. The study will be contracted to a private planning and transportation firm and managed through Denver’s Public Works Department. Although a representative from RTD will be involved in the project, it is interesting to note that the study is not sponsored by Denver’s transpor-


\(^9\) Ibid.
The organization that took over operations from the Denver Tramway Company, although the study is not funded or sponsored by a non-profit streetcar organization (the Denver Streetcar Coalition does not exist), the study is working towards the fifth step of the DSNR. The request for proposal (RFP) was released earlier this year and the study should be completed in early 2010 after the consultants are chosen in the near future. The RFP states that

The City and County of Denver (CCD) is seeking a creative multi-disciplinary planning and engineering team to assess the technical and economic feasibility for development of a “modern streetcar” line on the Colfax Avenue Corridor. Colfax Avenue is a state highway under the jurisdiction of the Colorado Department of Transportation (CDOT). The initial study area is bounded on the west by Interstate 25 (I-25), on the east by Quebec Street, on the south by 12th Avenue, and on the north by 19th Avenue. In addition to exploration of the feasibility of a streetcar application on Colfax in the study area, the Colfax Street Feasibility Study (CSFS) process will identify criteria to evaluate candidate corridors for a potential broader streetcar network.10

It is important to note that the City is trying to determine the feasibility of a streetcar for Colfax Ave. and establish criteria to evaluate future streetcar corridors that would form a streetcar network. While the network component is secondary to the primary study for Colfax, establishing criteria will aid the City in expanding or starting a streetcar

network, regardless of the results of the Colfax Study. The area that is defined to be studied is also important because the ideal route could be identified as a couplet, or one that would travel out of town on a street parallel to Colfax, and back into town on another parallel street.

The RFP references the transportation, land use, and development goals of the city when discussing the potential future of streetcars on Colfax Ave. It states that a streetcar project would align with the “City’s goals to increase the person trip capacity of transportation corridors such as Colfax Ave.,” a specific reference to the STP. It goes on to discuss that “attracting commercial and residential infill development in the city core is an important land use and economic development goal for CCD.” The RFP expects the consultants who are awarded the project will:

- identify the existing transportation elements, the existing transit and traffic operations including a person trip capacity analysis, and the utility infrastructure along the corridor;

- conduct an extensive public and stakeholder group process to gather input and present data analysis, alternatives, and recommendations. It is anticipated this will include two public meetings and three stakeholder/focus group meetings;

- determine the feasibility, opportunities and challenges for the design, financing, and construction of a modern streetcar line on Colfax Avenue,

11 Ibid.
• assess the potential positive and negative impacts of a modern streetcar line and service on the Colfax corridor and the surrounding community,

• support future National Environmental Policy Act (NEPA) compliance, and

• develop criteria to analyze the technical and economic feasibility of other corridors in Denver that might be well-suited for streetcars in the future.\(^2\)

The analysis will help to determine the financial, mechanical, logistical, and neighborhood approval feasibility of the project. The results of the study will be very interesting and will most likely include some of the information in the route and system recommendations below.\(^3\)

One of the lessons learned from Seattle is that having a streetcar network plan in the works is helpful before even planning for the first streetcar line. With two examples of modern streetcar systems in the United States from cities very similar to Denver; both with plans to expand their first route into a network, it would be imprudent to only plan for one route. That said, it is also helpful to have one route operational before moving forward with plans for other routes. The first route can gather support for future extensions or new lines, and help to persuade groups or individuals that were initially skeptical of the idea. Patrick Sweeney notes that "it is such a new and unique thing that exposing people to it and experimenting with it and evaluating how it performs is a really important first step before deciding ...[to] look at them citywide."\(^4\)

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\(^1\) Ibid. p. 2-3

\(^2\) Ibid.

\(^3\) Interview with Terry Ruiter, Planner with Denver Public Works, Telephone interview, Mar 23 2009.

\(^4\) "Request for Proposal for Professional Services for Colfax Streetcar Feasibility Study."
For this reason, it is recommended that Denver plan for a streetcar network, using the potential for streetcars to guide future growth towards the Areas of Change that are specified in Blueprint Denver and enhance the Travel Sheds that are specified in the Strategic Transportation Plan. The initial route, or two routes, should not only be iconic, but should be carefully chosen for guaranteed success. Without the success of the first lines, the possibility to extend the system in the future would be threatened. Success would be measured by the amount of economic development generated, the amount of development built compared to that allowed in Denver's newest zoning code (updated this spring), and ridership levels.

Although the preliminary Denver Streetcar Network Report was compiled by the elusive Denver Streetcar Coalition, having an official network plan completed by either the Planning and Development Department, Public Works, or a combination thereof, would benefit the city moving forward. Patrick Sweeney's "biggest recommendation" for other cities that are contemplating streetcars "is to co-manage it between transportation and planning, because it is as much about building up the neighborhood and economic development around the streetcar as it is about figuring out where the best place is to put the corridor." The CSFS is currently managed by Denver's Public Works with limited involvement from other City agencies, according to manager Terry Ruiter. It would benefit both Public Works and the Planning and Development Department to coordinate more throughout the process of planning and conducting feasibility studies for future streetcar routes.

15 Interview with Patrick Sweeney, Portland Department of Transportation, Telephone Interview, March 13, 2009.
The recommendations for a starter route and ultimately a streetcar network are based on analysis completed for Seattle and Portland, as well as analysis of the Denver area. Eight major characteristics that enhanced the streetcar route or systems in Seattle and Portland are applied to Denver in the form of a mapping analysis. These characteristics are also key elements discussed in Blueprint Denver, the DMAP, and the STP. The characteristics include the following:

- Streetcar Route Length: corridors not exceeding five miles from end to end or more than a 10 mile loop;

- Multi-modal Connections: connections to other modes of transportation, including light rail, BRT, commuter rail, and their respective transit-oriented development (TOD) stations;

- Major Destinations: ridership drivers including employment centers, hospitals, transportation hubs, cultural activity centers, sporting venues, educational centers, major and medium commercial centers;

- High Ridership Bus Routes;

- High Residential Density (existing, planned, or zoned);

- High Employment Density (existing, planned, or zoned);

- Redevelopment Potential by Use: including large surface parking lots, vacant properties, etc.;
• Redevelopment Potential by Code Classification: specifically historic streetcar neighborhoods, areas of change, and high density residential zones

Each characteristic is explained in further detail with the associated graphic analysis below. Streetcar routes are suggested for each individual characteristic that is analyzed. It was my intention to isolate that particular characteristic as much as possible, although my knowledge of Denver and planning background no doubt influenced the analysis to some degree. Next, the individual analyses are compiled together to suggest where in Denver a streetcar system might be most appropriate, successful, and possible. Lastly, this proposed streetcar system is compared with the historic streetcar system in Denver.
Streetcar Route Length and Multi-modal Connections at the Regional Scale

This analysis is completed using the existing and planned light rail stations as connection points for streetcar routes. This would link regional transportation to local circulator transportation and provide the “last mile” connection for people between their residence and place of employment, school, or recreation.

A 2.5 mile radius is drawn around each station in order to highlight an achievable distance for a streetcar route. This distance, approximately five miles long or ten miles as a loop, would not be required to travel between multi-modal transportation nodes, as it does here. However, based solely on route length, a streetcar route of 5 miles in length could technically exist anywhere in the city. The transit nodes serve to ground the analysis of route length to specific points on the map.

This map highlights the great number of radial connections that streetcars could provide between the regional light rail system that currently functions as spokes radiating out from the CBD.

Figure 5.6—Potential streetcar routes at the regional scale linking transit nodes using an approximate 5-mile route length. Source: Graphic by author.
Streetcar Route Length and Multi-modal Connections at the Local Scale

This map builds on the previous analysis, showing further detail at the city scale. The outline of this map can be seen in the middle of the previous map (Figure 5.6).

Using the light rail stations as transit nodes, streetcars could travel many different routes and still fall under the five-mile route length limitation. The most likely routes between the nodes include:

- Alameda Ave.
- Colorado Blvd.
- Colfax Ave.
- Evans St.
- Federal Blvd.
- First Ave.
- Hampden Ave.
- Sheridan Blvd.
- South Broadway.
- Wadsworth Blvd.

Figure 5.7—Potential streetcar routes near the city center, linking major transportation hubs using an approximate 5-mile route length. Source: Graphic by author.
Major Destinations

This map highlights major institutional, recreational, educational, cultural, and sports venues, realizes they will drive ridership, and uses them as connection points for potential streetcar routes. Three issues affected this analysis. First, certain destinations would generate more streetcar ridership than others (and potentially different kinds). Secondly, it is assumed that reasonable proximity to a streetcar line is important, but that the destination need not be directly on the streetcar line. Lastly, given Denver's extensive park network, only the largest parks were considered as ridership generators. The most likely routes between the destinations include:

- Colorado Blvd.
- Colfax Ave.
- Downing St.
- Evans St.
- First Ave./Speer Blvd.
- Hampden Ave.
- Seventeenth St.
- Sheridan Blvd.
- South Broadway.
High Ridership Bus Routes

This map and chart highlight the bus routes with the highest average daily ridership. The 15L (express bus on Colfax) and the B (regional bus to Boulder) would not be considered for replacement by a streetcar route. The map highlights:

- E. Colfax Ave. (15)
- W. Colfax Ave. (16)
- S. Broadway (0)
- Colorado Blvd. (40)
- Federal Blvd. (30 & 31)
- Evans St. (21)

Figure 5.9—Busiest bus routes in Denver by highest average daily ridership (2008). Source: Graphic by author; data from RTD.
High residential density

Using the predictions from the DRCOG, this map attempts to connect multimodal transit nodes to areas of high projected residential density that would be unserved by rail transportation. The most likely routes between the transit nodes and the high density residential locations include:

- W. Alameda Ave.
- Cherry Creek Dr. South
- Pearl St.
- Sixth Ave.
- S. Broadway.
- S. Cherry St.
- S. Teller St.
- Speer Blvd.
- Thirty-eighth Ave.

Figure 5.11—Potential streetcar network linking major residential centers, as predicted by DRCOG for 2030. Source: Graphic by author; data from DRCOG.
High employment density

Similar to the previous analysis, this map uses the predictions from the DRCOG to connect multimodal transit nodes to areas of high projected employment density that would be unserved by rail transportation. The most likely routes between the transit nodes and the high density employment locations include:

- Colorado Blvd.
- E. Colfax Ave.
- First Ave.
- Ninth Ave.
- Pearl St.
- S. Broadway.
- W. Alameda Ave.
- Wadsworth Blvd.

Figure 5.12—Potential streetcar network linking major employment centers, as predicted by DRCOG for 2030. Source: Graphic by author, data from DRCOG.
Redevelopment Potential by Use:

Major commercial corridors, such as those highlighted in this map, contain land uses that supply vast amounts of parking, including large retail stores and strip malls. Easily repurposed into mixed-use areas, this map connects multimodal transit nodes to corridors with high redevelopment potential and thus high land appreciation potential. The most likely routes between the nodes and the redevelopment corridors include:

- Colfax Ave.
- Colorado Blvd.
- Evans St.
- Federal Blvd.
- First Ave.
- Forty-fourth St.
- Leetsdale
- Morrison Rd.
- S. Broadway.
- S. Santa Fe
- Sheridan Blvd.
- W. Alameda Ave.
- Wadsworth Blvd.

Figure 5.13—Major commercial corridors. Source: Graphic by author.
Redevelopment Potential by Code Classification:

Using the Areas of Change highlighted in Blueprint Denver and the new Main Street Zoning districts along Colfax Ave, this map highlights routes that would follow redevelopment opportunities based on new (or planned) updated zoning that would support a streetcar system. The most likely routes to service these zones include:

- Colfax Ave.
- Colorado Blvd.
- Evans St.
- Federal Blvd.
- First Ave.
- Forty-fourth St.
- Leetsdale
- Morrison Rd.
- Park Ave. West
- S. Broadway
- Seventeenth St.
- Speer Blvd.
- Tenth Ave.
- Thirty-eighth St.

Figure 5.14—Potential streetcar network helping to redevelop “Areas of Change,” as defined by Blueprint Denver. Source: Graphic by author; data from City of Denver and blueprint Denver.
Analysis Compilation

This map uses each of the previous route suggestions from the individual analyses and compiles them into one graphic. The stronger the color of the route, the more often it was suggested as a viable streetcar route for Denver. In order of route suggestion strength, the potential system includes:

- E. Colfax Ave.
- Broadway
- Colorado Blvd.
- Alameda Ave.
- Federal Blvd.

Figure 5.15—Compilation of analyses highlighting the most likely routes for future streetcars in Denver. Source: Graphic by author.
Streetcar System Potential

This map uses the strongest routes from the previous map (Figure 5.16) to link routes together in a system. The new route possibilities, shown in blue, do not represent one continuous streetcar, but would be a series of linear routes and loops and would be based upon the level of service and the optimum length of the route. For example, the distance between the light rail stations on Colorado Boulevard is seven and a half miles. This would be slightly long for a streetcar, but could be broken into two different routes or could operate in its own right-of-way during peak traffic hours. The two most important lines that should be considered for starter routes include E. Colfax Ave. and S. Broadway.

Figure 5.16—Potential streetcar system in Denver and the relationship to the regional transportation network (light rail). Source: Graphic by author.
Future vs. Historic Streetcar Systems

This map compares the potential future streetcar system, the historic streetcar routes at their peak in 1926, and the neighborhoods that developed thanks to those original streetcar lines. There is a clear difference in sheer number of routes between the potential and historic routes, but the map also reflects the differences in theory behind historic and modern streetcars. The historic routes coated the city with a web that provided most people access to a streetcar within a half-mile walk. This also meant that many streetcar routes passed directly through strictly residential neighborhoods. There is no doubt that they attracted commercial development, but this was concentrated in the downtown and in small business districts along the routes. Modern streetcars would most likely exist on a grid that separates parallel routes by a mile or more and travel through mixed-use zones rather than residential zones.

Historic lines also continued to push development outward, away from the city center. Modern streetcars would pull development back within the city boundaries in the form of redevelopment, especially along commercial corridors and culminating at important points, such as regional transit nodes.
Based on the case studies from Portland and Seattle, Denver's current population projections, and the past and present planning efforts, it is evident that a streetcar route or system is possible in Denver. The route analysis conducted in this chapter proves the beginning of the initial return of streetcars to Denver could occur successfully on East Colfax or South Broadway. However, the City is making a mistake by not planning for an integrated streetcar network. The Colfax Streetcar Feasibility Study will eventually provide a set of criteria by which the City can evaluate future streetcar routes. Learning from both Seattle and Portland, Denver could use the time between now and when the CSFS is released in 2010 to produce a list of potential streetcar routes and coordinate the effort between the Planning and Development Department, Public Works, and other interested departments. These routes could be evaluated immediately upon completion of the CSFS. This would move the city towards a comprehensive streetcar network plan sooner and with more collective knowledge, hype, and momentum to move streetcars down Denver’s streets once again.
CONCLUSION

In conclusion, Denver’s current planning and transportation climate present opportunities to pursue not just one streetcar route, but a strategic system of streetcars for the central urban neighborhoods. This system would provide the desirable local public transportation that is highlighted in both the Downtown Multi-modal Access Plan and the Strategic Transportation Plan in a way that benefits Denver’s residents and the region at large. It would also help to direct the growth and redevelopment described in Blueprint Denver to specific corridors. The ability to direct this new growth and concurrently preserve Denver’s existing stable neighborhoods underscores the strength of streetcars as an urban tool.

A contemporary streetcar system in Denver would share many similarities with the historic streetcar network that coated Denver with over 300 miles of track in the early twentieth century. The system would not, however, be a replica of the old network. The general service area would be very similar, but streetcars would operate on select corridors with approximately one mile or more separating parallel routes. The new routes would entice development as they did historically, but this new development would occur on brownfield sites within the city rather than at the growing city’s edge. The historic routes served as households’ primary means of transportation before the widespread use and economic accessibility of the automobile. For this reason, it was not uncommon for routes to travel through residential neighborhoods. Today, however, modern streetcars would travel along mixed-use corridors that provide, among others, commercial, retail, residential, and recreational land uses. The only possibility for modern streetcar lines to travel through single-family residential neighborhoods in the United States today is if those neighborhoods are between major redevelopment areas or major destinations that would provide the necessary ridership generators. That is, of

Figure 5.18—7th Ave. and Pennsylvania in 1948. Source: Photo by Richard H. Kindig in Denver’s Street Railways, vol. 2.

Figure 5.19—7th Ave. and Pennsylvania in 2009. The same rowhomes are still there. Source: Photo by Author.
course, dependent on the necessary neighborhood approval, which would presumably be difficult to achieve in a residential neighborhood.

The ability to direct development and redevelopment within the city's boundaries in addition to providing transportation fit right in line with Denver's goals for growth management, multi-modal transportation options, and neighborhood revitalization. It will be interesting to see the results of the Colfax Streetcar Feasibility Study, but it is recommended that Denver take the time to compile a set of potential streetcar routes that can be analyzed using the criteria produced for the CSFS.

Figure 5.20—1st Ave. and Broadway in 1946. Source: Photo by John W. Maxwell in Denver’s Street Railways, vol. 2.

Figure 5.21—1st Ave. and Broadway in 2009. The same urban fabric is still intact. Source: Photo by Author.
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Interview with Carl Abbott, Portland State University

Date: January 12, 2009
Type: In-person interview

As someone who works above it and sees it in action on a daily basis, what is your general opinion of the Portland Streetcar?

I think it works great downtown. It is regularly used. It is used on weekends. It is used by students. It is used by tourists. It is used by the people who live in apartments down there [near the University and the waterfront] and in the Pearl District or the Northwest. I think it is a good addition and it will be interesting to see once the new light-rail extension is completed, which will be another North-South corridor through downtown (but several blocks away), it will be interesting to see how they compete with each other or how people decide to allocate their rides. The streetcar has had a good two years because the buses (the bus mall that used to be on 5th and 6th) got moved to third and fourth, which is farther away. So if you want to go North-South around here, you can’t hop on the bus anymore. So it’s good for the streetcar.

What do you think the biggest benefit to Portland has been because of the Streetcar?

I think the biggest benefit has actually just been linking this kind of long and narrow central core together in people’s minds. You know, if I were a property owner here, I’d say it was economic development. And clearly it has triggered, especially in sort of the area over there [Waterfront], a fair amount of residential development and a couple of office buildings. So clearly there has been that development and intensification of land use but I also think just helping people think or conceptualize northwest Portland down through Portland State as a single district, with a lot of sub-districts. Thirty years ago, in people’s minds, downtown stopped at Burnside, and of course there wasn’t any Pearl District then. There were a bunch of warehouses and no student housing, and until you got to Northwest, there was this big gap. It was the economic development (the Pearl District Development). So it was both direct economic benefit and the imaging of the city effect.

You mentioned the Pearl District was just warehouses, was that starting to turn over into lofts before the streetcar or what was the timeline?

It started before the streetcar, and I think that what’s happened is the scale and quantity... not surprisingly, it started with some actual loft conversions, perish the thought!, and then it began, sort of in the early 90s with some townhouses and some 3 and 4 story buildings, new buildings, and then I think with the streetcar came at the same time that people began to build higher, and it gained momentum. I suspect it wouldn’t be the same intensity of development without the streetcar.

Do you know where Portland got the idea of the streetcar? I’m not sure where the idea originated or if there was a champion or one person that might have...
Charles, (Charlie Hale) was a city commissioner in the 90s and was very much interested in transportation and smart growth issues. I think he played an important role in conceptualizing it. Portland is full of rail advocates of all stripes and kinds, so he was a point of access for people who are rail advocates. He has since gone on to work with Parsons consulting, and went around the country telling other people how to "be Portland."

As you're involved with the historical side of things, is Portland using any of its old streetcar routes for the new route?

A little bit. There were streetcars in NW Portland, but not the same, not the identical routes. And on the East side, I mean yes there were streetcars across the Broadway bridge and on Grand, but it wasn't... Historically, the pattern was [drawing] if here's the river, and downtown, and bridges, historically it was a streetcar coming into Grand. SE Grand was kind of a connection... come in here... go out there... across... It wasn't this kind of loop as much as it was an interceptor. So it seems to me that the Near Eastside streetcar extension is a different way of conceptualizing it than the pattern a century ago. When people begin to dream about the third stage... you know, out Sandy Blvd. or some of the arterials, the old streetcar streets, then we would be getting back to the old routes. But then that gets into the question "fundamentally, is that better served by streetcar or by frequent bus service" because those are of course served by major bus routes now. So would we be better off putting our money at that point into 8-minute headways than streetcars?

Do you think any of that is a function of people's desire to ride streetcar over a bus?

Oh sure, I mean people basically like to ride the streetcar. It is interesting, you know MAX, the light rail, has been getting bad publicity in the last year or so because of safety problems, which I think are solvable. Safety problems and malfunctioning ticket machines and things like that - but those are solvable management problems that are, compared to the cost of building a system, the cost of hiring fifty extra security people is pretty small. The agency just has to get itself thinking about that. The question... There is a question about some of the old streetcar streets, which in fact are booming. So do they need a streetcar? It's not like they're moribund and something needs to happen. So have you gone up to Southeast Hawthorne, for example? Or North Mississippi or Broadway beyond Lloyd Center? I mean there are a lot of businesses and there's turnover but there isn't much vacancy. They are districts with different kinds of reputations for different varieties of trendy-ness. I think the merchants would be very, I think they would worry a lot about giving up on-street parking, if the design... essentially there are a lot of four lane streets with two lanes of traffic and parking on two sides. Could you run the streetcar and maintain the parking... good question. And it's a much bigger question in a neighborhood district where people are accustomed to driving and finding a parking space within a block or two of the store they want to patronize than in downtown where you are accustomed to parking in the parking garage and then wandering around or taking the bus in and wandering around. It's a different environment.
In similar situations in Denver, in certain districts, one side of the street will be resident-only parking and the other side of the street will be visitor parking. A lot of the time, it just gets really crowded, especially around dinner time in these little districts. I don’t know if the residences would be more supportive of a streetcar because of parking issues or not?

I don’t know. I mean Portland does in some close-in neighborhoods, especially those on the edge of downtown, do have parking permit programs for residences. You know, you can’t park for more than a few hours in the adjacent neighborhoods without the residence permit to keep all the commuters from clogging up the district just south of here, and that sort of thing. But I think that’s a good question as to whether or not . . . one question is: do these old streetcar streets need it?

Would it be a function to increase mobility versus . . . it wouldn’t necessarily be to stimulate economic development.

It certainly would be a stimulus . . . The streetcar is easier . . . buses you have to climb up into, streetcar you walk onto . . . so it is more inviting in that way. You can walk around inside a streetcar. The difference is, riding the bus is like flying: you get your seat and if you’ve got a good one, you’re not going to give it up. A streetcar is more like a train, corridors are wide enough, you can wander back to the snack car and get something and wander back to your seat . . . so it’s a different type of experience.?

According to Portland Streetcar, some of their documents say that a successful streetcar will ‘both integrate streetcar corridors into the city’s existing neighborhoods as well as have redevelopment potential.’ Do you think there’s a conflict between the integration and the redevelopment? It gets back to preserving a neighborhood character versus stimulating economic development?

A lot of that kind of tension is happening . . . especially along transit corridors . . . that gets back to the smart growth infill housing question, where a number of . . . you’re either getting low house infill or 3 and 4 story apt. infill, along those old streetcar streets. So those changes are already happening. So I’m not sure . . . and the streetcar would certainly serve those. It’s not clear that they wouldn’t stop without it.

Can you talk at all about any opposition to the streetcar either during the planning phases or currently?

Some opposition . . . property owner opposition . . . There’s the local improvement district to help finance it and there’s been, especially in the extension, the part from Portland State down to the waterfront, kind of Phase 2 or kind of Phase 1B for the system, and there was a lot of discussion among . . . because there are several big property owners and sort of, what’s my fair share if I own 15% of the frontage along the proposed line, but I don’t have any development, I’m still an investor and user . . . is it fair for me . . . how much should the health sciences university be paying because their plans are expansion down here . . .’ So a lot of back and forth before they got the required percentage of property owners to sign on. But that, I think, was as much . . . I don’t think it was a fundamental opposition, it was negotiation . . . you know,
'if this is happening, what’s my best deal’.

I worked for the Director of Bicycle Planning this summer in Boston and when I mentioned I was looking into streetcars for my thesis she said, “Oh, they’re awful for bikers.”

Yeah, people … it’s the wheels. If you’re riding parallel, you don’t want to get caught in them.

I didn’t know if there were any bicycle advocacy groups in Portland that were vocal against streetcars?

They complain about it, their riders complain about it, but they haven’t been in any fundamental opposition. If you’re a bicycle advocate, anything that’s “green” is … I mean, how can you be opposed to streetcars if the alternative is automobiles? So it would be such a disconnect. But certainly individual riders complain.

There’s talk that the streetcar generated more economic development for downtown, but it didn’t necessarily generate economic development for the greater metropolitan Portland area - it just reallocated it. Do you think this is true?

That would be my guess. I’m happy to have it allocated in the core area. Portland, for its size, is one of the strongest cores you can have. But it’s still a competition. The office market is still in competition, with west-side suburban clusters. Interestingly, in the last statistics that I saw, which were a few months ago, were vacancy rates are higher in the suburbs, in Class A suburban space than in the downtown space.

I think that’s partly because of more speculative building there and more careful planning here. Office buildings have been coming online, sort of, one at a time over the last decade, as opposed to three or four developers hitting it at the same time. But yeah, I’m pretty sure it’s allocated … If we assume that most of the new downtown housing is either thirty-year old advertising executives or empty-nesters, are they living downtown, would those … are they living downtown because the buildings are here or was the demand already there? Obviously it’s partly that the demand was there but it doesn’t come to the … if you’re in the suburbs and an empty nester, it has to be interesting enough there [in the city] before you’re willing to make the move. So it is a kind of snowballing process.

And then, it’s also a matter of that type of development wouldn’t have occurred in Portland … the number of units perhaps, …

Yeah, but I think they would have been in different … Some of them would have been … because we have the streetcar corridor with the high rise apartment development, you know the Pearl district and the South Waterfront area, then there’s a lot of in inner neighborhoods there is a lot of row house infill, and my good friends who had their house they raised their kids in … in a very nice east-side neighborhood, they downsized to a row house about a mile south of here within walking distance of downtown, before there was a Pearl District. They wouldn’t be high-rise people, I mean George wants a place for a shop. But that trend was already … you could begin to see the trend happening.
Do you think the initial success of the first streetcar line gave the city the ability to do more with that particular mode of transit, or does it act as “proof” that you could then extend it elsewhere?

Yes, I think so. I mean, I'm somewhat skeptical of the east-side loop. I know it has very strong advocates ranging from local transportation advocates up through our congressman, (our transportation guru congressman). I worry about the... it's targeted to streets that have very very heavy automobile traffic, especially at rush hour; they carry huge amounts of traffic for Portland, but I worry about the kind of... obviously the streetcar line doesn't take out a lane of traffic like light rail would, but it still slows it. Whereas the 10th and 11th corridors were well used but they weren't the major traffic streets in and out of downtown, so they didn't... that didn't have a displacement effect or the same effect... they way I think going across the Broadway bridge, up past Broadway to the Coliseum and Rose Garden Arena... On the other hand, I have not looked in detail at the... this is what transportation modelers are supposed to do - figure that stuff out.

What do you think are the main differences between running streetcars along mixed-use - primarily commercial corridors - versus running it through medium-density neighborhoods.

It seems to me that it is a waste of the investment to run it through a medium-density neighborhood where bus service is probably adequate. Bus service and more frequent bus service could serve most of the travel needs. You can do a little more... because there's a little more elbow room on a streetcar; you can or could do shopping with a little pushcart at the grocery store and then roll that onto the streetcar; but not very effectively... it's a real challenge on a bus. So there is some... again, I think again they work better for basically commercial strips. And the place that kind of needs the cache of the streetcar is kind of the north Portland area, which is furthest away, and kind of really beyond light rail service. You know, if Portland is like this, [mapping] and here's downtown, and there's I-5, and there's the interstate avenue light rail line and the Gresham Ave. light rail line, it is this area out here, which has always been, it is not on the route... you have to want to go there to go there... it's always been a working class, with industrial uses, a working class area. It's always felt neglected by the city. The first “Trendy’s” have been moving in the last 3 or 4 years, but that's the area where streetcar could be a real catalyst, but it's way far away... in streetcar terms it's way far away.

And that gets into the length of planning a streetcar route too, I mean, do you really want it to go all the way in [to downtown] or it is just connected to the light rail? Is the loop across the river going to be one continuous car?

I think so.

It seems long for... in terms of how many stops they make and keeping on time.

I don't know what the operational plans are. And the other wrinkle is that the next light rail line is supposed to be coming across a new
bridge, and down on the south east side of the river down to the
town of Milwaukee, the first suburb of the city, and that will add even
more … one of the reasons they’re doing the streetcar extension
I mean the light rail extension past the University is that eventually
they’ll have a new bridge down there, so that’ll be even more rail stuff
converging. That’s not going to happen for another 10 years, but …
we’re trying to think ahead.

So if you were to recommend streetcars as a way to increase
mobility or connect to the overall system in the city to other cities
such as Denver, what characteristics or factors do you think have to
exist for its success?

I think there has to be … I think it’s useful to have districts with
development or redevelopment opportunities, like South Waterfront
or even the west end of downtown. I think corridors, like Colfax,
where there is a lot of traffic, I think using the streetcar to connect to
destinations … so could you run a streetcar that connected Cherry
Creek and the Botanical Gardens into downtown and Capitol Hill and
the Art Museum … I mean, could you find a route that would pick up
tourist business, because tourists will ride a streetcar. They see the map
and see that it goes one place, when they might be reluctant to ride
a bus both because of the kind of class prejudice issue and they’re so
damn many buses, ‘am I getting on the right one? and the route map
says there are 3 lines here, which one do I want?’ So it’s much harder ...
… you have to really be a local to figure a bus system, but a streetcar …
“oh! it goes to …”
Interview with Ethan Melone, Seattle Department of Transportation
Date: March 24, 2009
Type: Telephone interview

I noticed the great streetcar network planning that is going on in Seattle. It seems like you are really moving ahead with streetcars?

There’s a network tab on our streetcar site that has all of our documents from our network development report. So we’ve kind of completed that planning phase and the city council has adopted a resolution sort of endorsing the four most promising routes for extension. And now we are starting to work on those routes. One of those routes was funded through a regional measure last fall. So we’re starting to work on that route, and we’re looking for funding to do the engineering work on another route as well.

What is your general opinion of Seattle’s streetcar in relationship with the other modes of transit available in Seattle?

I think that the streetcar provides kind of a premium level of service and a different experience for the transit rider from buses. Our light rail system hasn’t started operating yet. When it does, it will be similar but will focus on longer trips. The streetcar is intended to serve more center-city neighborhoods, where as the light rail brings people from farther out to the center city.

Where did the idea of a streetcar originate in Seattle? I have heard it was Paul Allen’s idea as a way to bolster his development opportunities in the area but also heard it was the mayor’s idea?

The Portland streetcar was already in operation when the mayor came into office and he’s someone that has always been involved in transportation throughout his career. He was on the Sound Transit Board when he was a King County Council member before becoming mayor. He was involved in organizations like Railvolution, so he knew what was going on around the country. I think the mayor had an interest from his knowledge of what was going on in other cities and the success of the Portland Streetcar and in bringing that to Seattle. And of course we had a vintage trolley system on the waterfront, it’s not in operation anymore, but we had some experience with streetcar here in Seattle. I think there were both people in the community and the private sector that were interested in it but I think it was when mayor Nickels came into office that it became a priority of city government.

With so much input from developers in South Lake Union, were other options considered for the first line?

There was kind of a network report done at that point as well, in 2004. There was a network feasibility report done that looked at a number of routes. But ultimately, that route was one where because of the development potential, there was an opportunity to form an LID and serve as a catalyst for launching a modern streetcar system by having some funding commitments through those property owners.
What are the major ridership generators along the route?

Right now it is primarily employment at places like Fred Hutchinson Cancer Research Center and Group Health Cooperative and University of Washington Medicine has a research center in South Lake Union. Then there’s kind of a destination retail area halfway along the alignment where there is a Whole Foods Market and various other retail and a hotel. It’s another draw. And then Lake Union Park is, particularly in better weather, a draw. We got about 5,000 riders on July 4th when there were fireworks there for example. Now there is quite a bit of construction there because the park is being improved and expanded in two phases. The first phase was completed last spring kind of on the water side, so that’s completed, but now they’re in construction of the rest of the park, so it’s possible that this summer, because of the level of construction, that it might not be that much of a draw. But by the following year when it is completed, that will be an attraction. Also, next year, Amazon.com is moving its corporate headquarters to a series of buildings in South Lake Union that are under construction right now, so there will be that additional employment and that will, the expectation is that there will be a lot of additional retail with that concentration of employment, so. It will start to be increasingly kind of multi-faceted in terms of the ridership generators. Employment, residential growth, retail attractions, and the park. And then, there’s also, in the other direction, for the employees based there, there’s the attraction of downtown and the downtown retail core for non-work trips during the day or after work.

How is ridership? When are the biggest peaks, weekdays, weekends ...

There are both day-of-week, time-of-day, and even seasonal variations in the peaks. So right now, this is sort of off-season in a sense. So our peak days are weekdays and the weekend ridership is a little lower. Whereas in the summertime, that can almost be reversed. Not that the weekday ridership goes down, but the weekend ridership goes up quite a bit. And then we have traditional am and p.m. peaks for commute trips, but there does also tend to be, and again, particularly as the weather improves, from noon to 3, there are trips of people going out to lunch and mid-afternoon trips. We have a fair amount of ridership from tourists and convention-goers that are visiting the city. Again, that’s more in the spring and summer time frame.

How is Seattle streetcar measuring success of the line - in terms of ridership, economic development, push for expansion?

Quantitatively, we have a ridership forecast and we exceeded that in our first year by about 30%. So we will continue to use that as a basic quantitative measure of success. We also try to keep track of development activity. Although we don’t really have that set up as a formal measure for the streetcar. More of an intangible is the support we have from all the neighborhoods that have interest in having a streetcar in their neighborhood. Even as we start planning for the First Hill Streetcar line, there are a lot of different neighborhoods along the alignment or the potential alignments that are competing to have the streetcar serve them. So that’s kind of exciting. I think it does reflect
the fact that now that there is a streetcar operating in Seattle, it's easy for people to go and experience that and envision what it would be like in their neighborhood.

**Do you think a city needs that existing line before planning to bring it to existing, established neighborhoods?**

I think it certainly helps. One of the things that we did for the Southlake Union Line is we sponsored a number of trips down to Portland. Obviously that's easier to do from Seattle to Portland than some other areas. So that people could experience it in that way. We've had several cities come and visit us, usually as part of a multi-city tour, where they bring, often they bring a sort of public/private group of people that are interested. Certainly if you have a first line, it's more broadly understood.

**How would you compare Seattle's streetcar to Portland's streetcar? Are there major differences or similarities that you would point out?**

A major similarity is that one of the major areas that they served with their first line was an underutilized area that there were development plans for, you know the Pearl District, which has some similarities to South Lake Union. Some of the differences...the Pearl District has more of a residential emphasis, and retail, but not commercial. South Lake Union is being a little more driven by commercial development, various kinds of office and medical research. Although there's intended to be a mix of residential and commercial. Portland also started with a longer segment than ours—3 miles.

**Can you speak at all about particular opposition to the streetcar either during the planning phases or currently?**

During the planning phase, it was mainly a question of funding and competing funding priorities. Now, there's probably still some people that aren't particularly supportive of it, you know, they're maybe not in that neighborhood and aren't served by it. But there's less and less of that.

**I know there have been a few articles about the conflicts of streetcars and bikes.**

For one thing, I think in both cities, we're kind of learning from the early experience and trying to put more emphasis on integration of bicycle facilities with future alignments and designs. One of the key tools for that is to try and have a center alignment where possible. The other thing, I would say, is that it is a learning process. We had a few accidents in the early going, and I'm sure there will, from time to time, be accidents where cyclists get their tire stuck in the rail groove, but it hasn't been happening as much because we have a lot of signage out there and as people get more familiar with it they find routes where they're crossing at an angle that works or using an alternate route.

**Do you think the streetcar attracted new economic development in Seattle's metro area that wouldn't have occurred otherwise, or simply redirected development that would have occurred in the region naturally?**
In some ways it's hard to answer that hypothetical. What would some of the firms and institutions that chose to locate in South Lake Union have done if they didn't see South Lake Union as attractive? You know, would they have picked another spot in Seattle, another spot elsewhere in the region, or left the region? And also I'd say it's a little bit too early to tell. But long term, having an area, a large area close to downtown with the amenity of Lake Union close to it, is clearly one of the competitive advantages that Seattle can build. So to make that investment and expand the notion of the center city and where firms and residents can locate in the center city I think is a long term, not just a shifting around of development, but increases our competitiveness.

I don't know Seattle too well - but I hope to come and visit to ride the streetcar soon - but do any of the proposed extension corridors include existing, stable main street areas, and if so, how do you think extending the streetcar into existing, successful main street areas will go over with residents and businesses? Is there push-back from particular groups? Support from particular groups?

The First Hill Line is the only one that is funded now, and we’ve really only been hearing from people that want the streetcar to be in their area, on that line. A lot of the others …we’re at kind of an early planning stage. So I don’t really have a general comment on that.

If you were going to recommend some key elements that need to be in place for another city to introduce modern streetcars, what would those elements be? Would they include leadership, progressive transit authority, progressive business districts, and the like?

I think trying to pick a route that will try to have either immediately or in a relatively short period of time, multiple sources of trip generation. In other words, not just commute trips or not just a trip to an event area or an attraction, but some combination of both would be important particularly for a first line, to be able to demonstrate the way streetcars can be used as a circulator through mixed use urban centers, rather than just a commuter service. Because that’s really the intent in most cases, making the streetcar investment, is making an investment in areas that are going to have a variety of trip purposes….Yes, persistent leadership from the top is important. We had that in Seattle with our mayor. And it’s also helpful, particularly on a first line, if there’s also some group in the community, whether it be business oriented or grass roots …whatever might be appropriate to the alignment. But if there’s an advocacy group outside of govt. as well, those are kind of two pillars of moving the project forward.

I was speaking with Patrick Sweeney in Portland and he was touting the fact that Seattle has trolley buses but still went forward with the streetcar as proof that the development potential and associated developer confidence in rail is much higher than in buses. Do you think this is true?

I think we are looking at, probably not a lot of expansion of the trolley bus network, but we have a pretty extensive network, but the potential to make some upgrades to it, to make it almost more like a
streetcar service. But a lot of people don't even know when they get on a trolley bus that they're on a trolley bus and not a regular bus. So I think that's generally true, that people don't associate buses of any kind with urban revitalization efforts and reasons to make long term investments. Whether that's fair or not, that's not really the argument that we'd be making, but that's the experience, that's sort of the reality. ...that people don't make investments around buses.
Interview with Peter Park, Director of Planning, City of Denver  
Date: March 26, 2009  
Type: Telephone interview

What is your reaction to the recent trend of modern streetcars in cities like Portland, Seattle and beyond?

Well, number one I'm very excited that these are happening, because, as you know, so much of Denver and Denver's neighborhoods were built around streetcars and trolley. You're from Denver, correct? [I am.] So, in your research I'm sure you've noticed the loss of the streetcar transit system that was really the backbone of the early urban system. And the misfortune of their removal in just about every major city in post World War II. And so for me, the post World War II phenomena of delinking our public transit and choices of transportation, it was, how would I say it, sort of like an experiment. Right? That proved to be quite fatally flawed. Um, because it created our suburban sprawl patterns and kind of erased the memory, kind of like a stroke. It erased the collective understanding of the importance of creating a vanity around multiple means of transportation. It's not so much cars are the problem, the problem was relying only on cars.

What would be some reasons to bring streetcars back to Denver?

Number one, we have a plan, I don't know if you know about it, called Blueprint Denver. So, the premise of Blueprint Denver is integrating land use and transportation. So, it's really one of the few large cities that has a plan that is explicit about creating land use and transportation. And recognizing that in the growth of the city post WW II particularly there's been a growing dependence on the automobile. And not unlike most other places the VMT has increased faster than the population even though we've had real growth in population, there's a higher percentage of growth in VMT than in the population. So, number one the notion of thinking about streetcar and other enhancements to our transit mobility lines up with our goals and our adopted plan that encourage mixed use and accommodating greater density. We're growing we have fixed boundaries so where are the people going to go. And so, what Blueprint Denver does is it talks about Denver density, the positive side of density and where density can be appropriate and desirable when it helps to support investments in transit: when it can create whole new neighborhoods, new urban neighborhoods. The way I talk about it to people, in fact I'm writing a paper about it, is it reveals the DNA of the city. You know I have, when you look at the original streetcar line map you see very clearly commercial corridors like 32nd and Lowell, Colfax Avenue, Pearl Street, South Gaylord. Even in my neighborhood in Park Hill along 23rd up to Hudson. That used to be a trolley coach line. So, embedded in the DNA of the city is an urban transit system that's been paved over. But those neighborhoods are still very strong. Those commercial main streets are very desirable places. They help command and maintain strong residential property values because they're such desirable places. But there aren't such desirable places made around the automobile. Right? The automobile created zoning and regulations that scoured away the frontages on Colfax,
for example that gave it a very pedestrian and urban character. Now we have a lot of that still, but until we change the zoning and created a new zoning district called Main Street, the B4, the B2 the zoning districts really encouraged the scouring of our main streets, which was kind of stupid. So, and you know FasTracks, that we are expanding our transit system. [Yes.] Um, I sort of compare it like this: by the late 30's, Denver had nearly 300 miles of streetcar trolley and urban trains. Right, nearly 300 miles! And right now, we're very proud of 119 mile expansion of rail/bus rapid transit in the 8-county region. Denver alone as a smaller city had nearly three times the miles of what we're so proud of expanding in an eight-county region. I'm not saying that to diss FasTracks, but I'm just saying the potential of the strength of these neighborhoods becoming even stronger and connecting new neighborhoods in Denver and growing around transit would be significantly greater. There's a whole range of things from creating a sustainable city to just creating a more vibrant urban life along these corridors.

Speaking of FasTracks, do you think that it serves the Denver region more than it serves the City of Denver's neighborhoods?

Well, there really hasn’t been much development yet around transit. So, I’m not really sure that I would say that suburbs have benefited more from FasTracks than Denver. I actually think that everyone will benefit if it’s done well. For example, I think it will be a total failure, or nearly a total failure if all we end up with is you know, rail transit and Park and Rides, which is dependency in more suburban locations. The notion of introducing mixed uses close to the station and making walking vibrant places, I mean that is something that makes sense to us in Denver, and we’re working on about ten plans right now. Including station locations to help shape that and guide that. I don’t know that that is really happening a lot in the suburban parts of the region. So you know, it kind of the difference between having an alternative way to move around, you know, that’s one way to look at transit, we really look at it far beyond that. We really look at it as a new, well it’s not really new, but as a critical ingredient in creating urbanity, as creating value, in creating new places and accommodating growth in a smart way. Actually creating authentic urban places. So we look at it more from the development point of view, than we look at it just from a mobility option.

Denver's great main streets, such as Old South Pearl or 32nd and Lowell were formed around the streetcar. If streetcar were to return, would residents resist due to fears of increased density or unwanted changes to their neighborhoods?

Absolutely, that is a constant struggle. Denver has a... it's not really all that uncommon. There is a pretty significant resistance to densifying the city. That's kind of an American thing. Not all neighborhoods though. There are some folks that want to see more density. That's not the norm. Part of it is... again, it's not just an alternative means of getting around, it's adding choices in your life. In the US, we think ourselves fortunate to live in a free country with a lot of choices. But in fact our federal policies and what happened post WWII really diminished our choices and higher dependency on the automobile. I think there's enough awareness that having different means of mobility
is desirable. But I think it gets down to where the rubber meets the road or where the steel hits the road. I mean do people really want those lines to come back? That's why we're ... we've actually got an RFP out to study that. From I-25 to Quebec, between 13th and . . . . [And that's the Feasibility Study with Public Works?] Yes. I think the thing is, as you mentioned earlier the Pearl District in Portland. What's promising there is that . . . And even smaller examples, like Kenosha, WI. I actually worked on the downtown plan in Kenosha when I was a consultant in Milwaukee. And we put in the plan to put back the streetcar, and they did it! And it has helped them connect to the Metro line, which is the heavy rail connection to Chicago, between Chicago and Milwaukee, so it allows Kenosha's downtown to change from what was ... a little bit of irony here, AMC used to have their car manufacturing plant in downtown Kenosha, and that was the main employer and all the secondary industries supporting that . . . when they pulled out and closed, it totally devastated their economy. They had to retool their economy away from the auto industry to become more diversified, and part of that was enhancing their downtown, making it very desirable and livable and marketing it to the largest employer in Kenosha county at the time, which is Abbott Labs, an Illinois company right on the border of WI and IL. So it gave people an opportunity to live in a small downtown, in a small town, but having some interesting historic fabric to it, at the low front of the new marina, being able to take the streetcar to the metro, and getting downtown, downtown Chicago or suburbs of Chicago within an hour. It's a question of connections and connectivity. I think that the fact that other cities, like Portland, are doing it and seeing some success, helps folks in Denver say, "Well it they can do it, we can do it."

But it's ... I think that we're ready for it. We have something, part of implementing Blueprint Denver; called the STP, Strategic Transportation Plan. I guess number one, the most important thing about that is it is not a conventional way of looking at transportation, in that we looked at person trips rather than counting cars. So right there, there's an assumption that not everyone is . . . that our transportation plan is not figuring out how to accommodate only the automobile. We're looking at person trips based on land use and the intensity of land use forecasted in Blueprint Denver. So there is an example of linking the land use and transportation elements in an integrated fashion. The second thing about it is it is explicit about saying 'we aren't going to be widening these streets.' Now we may in some places, but for the most part, we need to look at a broader spectrum of the ways people get in and around our city. By 2030 there's like 5.4 million person trips per day, and 60 percent of those are generated by people from outside of Denver. So here you have a situation where most of Denver's streets, the travel along corridors is supported by Denver taxpayers, but most of the demand is coming from people outside the city. So again, the ability for us to accommodate local travel, is going to be affected by the regional travel demands. So the more options that we have for shorter trips or medium-length trips. Not commuter trips, but getting in and around Denver, the better off we're going to be.

What are the key pieces that need to fall into place for streetcars to return to Denver? And equally as important, what are some potential barriers to streetcars in Denver?

The first thing is the challenge of getting people to see the benefits,
and getting people excited about it. I think I’m confident it could work, but what is it going to take politically for people to support it. I think the biggest challenge, however, is funding. Plain and simple. We passed a 4.7 billion tax measure 3 years ago to fund FasTracks, and it turns out that’s not enough money. So we’re trying to find out in the region more capital to build out FasTracks. For streetcar there are different models of funding. That will also be part of this feasibility study. Is looking at how to do it. You know, we have the densities today, and we have the capacity to add more density along the corridors that are logical. Colfax would be a great re-start for our streetcar system, because there’s a lot of land for redevelopment and a lot of land could be repurposed, and the rail and the streetcar running constantly could help create more investments there.

The Strategic Transportation Plan (STP) mentions Colfax and Leetsdale as potential streetcar corridors. I understand the reasoning behind Colfax, but didn’t understand the reasoning behind the Leetsdale recommendation.

I think if you look at the … if you look at the FasTracks network, we kind of joke a little that streetcar in Denver is ‘NexTracks.’ But if you look at the regional system, in this case our regional system is a little bit challenged because most of the rights-of-way are going through former heavy rail, or industrial rail corridors. Or in the cases of T-Rex, occurred simultaneously with the freeway expansion. So with T-Rex, you don’t really get 360 degree redevelopment opportunities. You’re sort of on one side of the freeway or the other. Moving to the industrial corridors, a lot of these stations are not well connected. They lack infrastructure. Some of them are sited in the middle of former industrial land, I mean there’s not even a sidewalk to the station. But the next level of connectivity between destinations and new areas and existing areas of density is where we have opportunity with streetcar. That’s why again, I think for me … I mean we still … maybe but, I think Colfax is probably the better candidate, just because the compatibility of the streetcar with the existing physical pattern of development is stronger. Leetsdale doesn’t have a main street urban corridor characteristic. It’s a very suburban look and feel. So the linkages and the relationship of the land uses to the buildings form and the transit and the pedestrian is pretty weak. Whereas on Colfax, you step off the Streetcar and three more steps and you’re in a nice restaurant, or the lobby of your apartment or condominium. So I do think Colfax is the stronger candidate.

Would streetcars also work on the South Broadway corridor?

Yes, again, not just because they were there, but this sort of convenience of understanding why streetcar is a superior choice, is more apparent. Plus the capacity along those corridors, both immediately along the street as well as a block, block and a half, is already there.

What is your opinion on the streetcar verses bus argument … some people argue that a bus is much more flexible with its route, but others respond that more people will ride a streetcar and more importantly, streetcars will attract more economic development. Where do you fall in that argument?
I do believe that people will ride transit, a rail or a streetcar more readily than a bus. If I don't have a choice, I'll take whatever there is. But for those that can choose, there's something about having a rail that is better. From the developer's point of view, it is a higher certainty that, you know, I can see the evidence that there is a rail, and there are going to be people getting on and off the streetcar here. I think also from the user's point of view, riding on rail is far more comfortable than riding on a bus that swerves in and out of traffic and absorbs all the bumps, especially moving along urban corridors. So streetcars are smoother, and if you have a long ride, you can actually reasonably do some work or read the paper, things like that. And so I do think that...and streetcars are just simply quieter. The annoying sounds and smells of buses...for me, streetcars are superior to that.

Do you believe that streetcars could attract new development to the Denver region? (that would normally not occur here, or would it simply re-orient development from the Denver metropolitan area into downtown neighborhoods?)

I think it's hard to know. I think having the certainty of the streetcar allows us to create better development with more certainty, development that would have a fuller focus or a fuller orientation to transit and pedestrian uses, rather than highly dependent on the automobile in conventionally speculative assumptions. While we have buses, I don't think that bus transit availability would weigh the same as rail transit. Mainly I guess I think that building around transit gives you a better opportunity to make better places that become more and more desirable. If people don't believe that or don't know it, again, I just keep talking about 32nd and Lowell and S. Gaylord. I mean look at how desirable they are. Who hates these places? We have this trace evidence all over the city of these little commercial districts, little main streets that people love. People love being able to walk to the grocery store or to a restaurant or to an insurance office or...whatever it may be. The only way it ever could happen is because of streetcar. You know, they don't have enough parking. I don't know if you know Sushi Den, on South Pearl? [Yes.] You know, it's a ridiculous parking situation there. They have virtually no parking there, and the whole neighborhood gets all parked out. And people kind of complain about it, but they kind of don't because it's nice to have a nice restaurant in the neighborhood. But it's a city, it's an urban place. People go there and say there's a huge parking problem. But if you had different ways of getting there, I can tell you you will still have a parking problem because people will still drive. I like to quote Yogi Berra, “No one goes there anymore, it's too crowded.” That's sort of what we strive for in making successful urban places, is people are going there! That's how you know they are succeeding. Again, that's kind of the difference between the post-WWII, now outdated, model of thinking about how you plan transportation in the city. The focus was on eliminating congestion, which you can't, and accommodating parking. Well, if you walk around downtown Denver, you understand the tragic outcome of that thinking. There are surface parking lots everywhere, one-way streets that serve in-bound and outbound peak period travel, but then present streets that are too wide the rest of the day. And really make them unsafe for pedestrian. They were supposed to make them convenient for the automobile, for let's say, a total of 2-3 hours a day out of 24 hours a day, at the expense of the pedestrian experience.
and safety, I believe. I mean we have a long way to go in re-thinking our overall transportation system. I think that having streetcar is a good thing, simply because it gives us another ingredient in the mix of what the offerings are. I think in this case, if you are creating an urban place, sustaining an urban place, growing an urban place, you need more tools in the toolbox.

There is often emphasis put on using a streetcar to link major destinations in a city, such as a hospital or museum or university. What do you think are the major destinations in Denver that are currently not served by light rail that might be served well by a streetcar?

Maybe I should learn a little more, but when I think of streetcars, I don't really think of them as linking major points, like point A to point B. I think of them as serving multiple points along these corridors. For example, Colfax is this sort of major centering of the city. The major arterials north/south all have some intersection with Colfax. So when you look at the original network, just identifying that central spine, is the first piece to establish, the first stake in the ground. You know, we've looked at a couple of different versions. There's something called the downtown circulator. We have the mall. But there's also a study looking at the downtown ... do you have the Downtown Multi-modal Plan? It is in addition to ... So DMAP is looking at, in addition the 16th Street shuttle, creating additional capacity and circulating people especially on the 18th St. corridor in connection with Union Station. Because, when Union Station is the hub and all the regional lines connect to there, we already have a huge demand on the 16th Street shuttle, which is fantastic. But the higher density of employment is a little farther north, along 17th and 18th. So expanding that system in the form of a streetcar and connecting that to an east-west line on Colfax I think makes a lot of sense.
Interview with Jeanne Robb, Denver City Councilwoman, District 10
Date: March 20, 2009
Type: Telephone interview

What prompted your support of streetcars on Colfax?

I think what prompted it . . . I'd like to know where I got the idea, where in the beginning there was just a little bit of talk, it was more of a nostalgia thing, but then because people who were advocates for Colfax and the historic neighborhoods around Colfax saw it as a nostalgia thing, then I started to learn about the economic development piece or the economic development that streetcar brings. And that's what got me thinking about it a little bit more. You speak to the idea of great streets on your website. Could you talk a little as to how a streetcar fits into that idea of great streets?

There are so many things that I think of as a great street. Denver has the living streets initiative; some people call them complete streets. But to me a great street is a street that has lot of activity on it, with the buildings that come out to the sidewalk, and the sidewalk wide enough for pedestrian activity, safe crossings . . . streets where people want to be. Everybody who takes transit, whether it's a bus or a streetcar, is in the beginning a pedestrian and at the end of their trip a pedestrian. The idea of balancing all of the traffic and that it's not just one person and one car and then thousands and thousands of cars, but to be able to get a lot of people trips in one vessel. Frankly, streetcars are sexy. I start to . . . You know I say there was a certain nostalgia about it, but people would rather take a streetcar than a bus. And frankly, I know our mayor has challenged me and other people to say, you know, do they really pay what you hope they would pay . . . in terms of, is the economic development that much better than a bus. Of course Colfax has this other problem that the Number 15 bus has this interesting group of people that ride it. So it was a little bit about re-branding the corridor to be honest.

Can you talk at all about the redevelopment opportunities along Colfax and how that might fit with a streetcar?

Some of the things that are happening . . . of course we have the Justice Center actually on Colfax at one end. Like for our streetcar feasibility study we're looking at either the Civic Center Station at the top of the 16th Street Mall or the Auraria Campus where you've got a good amount of density. But as you move east, there's huge potential really right around the State Capitol. The Coalition for the Homeless is doing one of their deals there. They're calling it the Uptown Renaissance Lofts. Basically it's low-income housing, which made some of us nervous. We think we have a concentration of low-income housing in Capitol Hill, but at the same time, if it is good design and has retail on the ground floor; maybe that's where we need to start. That's okay with me. What we're talking about is the character of the street, not the characters along the street. That's going in . . . We are gradually, this is really interesting, there's a building at, I want to say it's at 500 E Colfax, so Colfax and Penn maybe, it's old name was Utopia Flats, it was a luxury apartment building in the early 1900s, and now it has
like Duman's Cleaners and Knobb hill bar on the first floor. It's pretty crummy first floor retail but such a great building. Well finally someone has bought it. It never had anything on the second and third floor for twenty years except pigeons. And someone is coming in taking it down to the brick and putting in loft-style office space and fixing up the exterior. That's maybe a first step, but you know the smaller projects are things that weren't happening for twenty years! along the corridor. So then moving farther east, my office happens to be in the old Rosenstock building and Alta Court there some developer called Triton Investment who have done this upper Colfax area, say between Downing and Franklin. I think there is real potential at Franklin because it's the intersection with Park Avenue. I think there's real potential there. There's a high rise already. Then you're getting down to around East High School and the Lowenstein Theater. I'm glad you're from Denver. Charlie Wooly who was the developer, and his company is the Saint Charles Company, who was the developer of the Lowenstein and the Twist 'n Shout, has bought the filling station across the street in front of East High School and wants to do retail with a couple stories of residential above. He had a grander plan for what I call the Church in the City, it's really right in East High's front yard. It used to be an old Safeway and then it turned into an urban church. He had a grand plan of doing five stories of residential with retail on the bottom but now the economy has cratered. He already spent money to move the congregation of Church in the City over to an old synagogue just a block away, and that's perfect for them. And now he's trying to figure out what to do with that site. And I'm working very hard, we have money for a central Denver Rec. Center. This is a part of town... I'm working very hard, because Charlie's idea, that I have totally bought into, and was actually in the East Colfax Plan, is to have sort of a town center right around York, Josephine, and Colfax. I love the idea of a rec. center there, because this part of town doesn't have a Rec. center, but the population that needs most to be served is to the north, not south, in my district. And it's on transit and it's near a school! So... we've got a funding gap, so between the streetcar and the Rec. center; I'm kind of jousting at windmills. And if there were a rec. center there, you know, Charlie has another building right across Josephine from there, but some day that could be redeveloped. There's a 7-Eleven on the corner of Josephine and Colfax that's really seedy and could be redeveloped to a higher and better land use. So that's good... and then moving east, we've got the Bluebird District. When I was younger, not much older than yourself, we used to call it Bluebird on the Park, not the Bluebird District, because that's a great neighborhood sandwiched between Colfax and City Park. But that Bluebird District where you're getting some pretty nice bars and night places and some nicer retail... and then you hit National Jewish. And right along the Bluebird District they have a new infill project, Chamberlain Heights, and we've got another one going up at Colfax and Madison. So then you get to National Jewish, and National Jewish is interested in the Gove Community Site, and I just see National Jewish as eventually providing the jobs that will activate the street. There are some used car lots that people aren't selling now at Colfax and Colorado, but someday will be ripe for redevelopment. So, there's a huge amount of potential. Part of what our Streetcar Feasibility Study will look at is, is there really enough economic development potential. Because if you're going to spend the money to put in a streetcar; are you really going to have that increased development that will essentially pay you for it.
So that's really something we have to study. There was a study done in 2005 and I haven't found it yet in my electronic files, because that I wanted to send it to you. At any rate, it talked about a streetcar that started at Civic Center Parkway out Colfax then south on Colorado by the former Health Sciences Center site, down 1st Ave. into Cherry Creek, then back to downtown. That would be such a great circulator between economic development nodes. … Then back into downtown along Speer or Broadway.

What would be the criteria that you would use to determine whether or not a streetcar on Colfax was a success, if one was implemented?

I think just being able to finance it would be a success! Being able to pay off the bonds? I don't know how we would finance it. I think some cities, and you can probably tell me this better; did Portland use a sort of TIF? I mean it was a development community … [BID and LID]. Well to me, if you can pay off the bonds you issue to pay for something like that would be a huge sign of success. Others would be the economic development generated. I think enhanced street-scape, liveliness of the street would be another measure of success. And off the top of my head that’s about … yes, and a re-branding. And when we had the streetcar conference here, the people who came to speak said, “Don’t spend your time arguing over where to put a streetcar,” of course you have to make the best choice in terms of economics and everything, but “just get a line started, because that’s what helps it keep going in other parts.” So if it generated an extension where we were able to build or a new line, I think that would be a sign of success.

Based on that determination of success, if a streetcar along Colfax is implemented and is successful (based on the previous question), where else in Denver could you imagine streetcars?

As I already said, I mentioned the Colfax line being more of a loop. In talking to people who are looking at bidding on the feasibility study, someone suggested that it go out Colfax and then maybe it is paired with something along 17th Ave. And 17th really has a Main Street sort of character. People talk about West 38th as one that I have heard discussed, you know over towards highlands out of downtown, and … I should have better answers to this because I know more locations have been discussed … umm, Colfax and W. 38th, and, oh I know, Broadway. Especially as a connector between … and that could be a logical extension of the Colfax line, especially between Alameda Station and the light rail station. Because right now if you’re on light rail and you stay on it, you’ll end up at the LoDo end of downtown. But if you work at the uptown end of downtown, having a connection from the Alameda light rail down Broadway. And again, that’s another sort of Main Street area. … You know, RTD was talking about Light Rail, and it made all the businesses so nervous because they thought they would have all this time while it was under construction when they would not be bringing in revenue. But according to Charly Hales out in Portland, you can lay streetcar rail pretty quickly. [Yes, I think it’s 2 weeks per block] Yeah, they have short blocks, but yes.

It is often said that modern streetcars offer a combination of economic development opportunity (value capture) and increased transportation options in the form of an urban circulator. Would one
goal take precedence over the other in the case of Colfax?

I think the economic development takes precedence. I mean, we do have a local bus right now, and streetcar would to a large extent replace the local bus. And we already have high ridership in the corridor, you probably know that from your research.

Reading through Public Works' recent publication, the Strategic Transportation Plan, it mentions streetcars along Colfax and even along Leetsdale. I was sifting through some of the response to the Strategic Transportation Plan and came across Randall O'Toole’s comments (with the Independence Institute). What is your response to his opposition to streetcars along Colfax which is based on the current high traffic counts and the fear that they would slow traffic along this corridor?

Well ... I think he ought to go work for CDOT ... but, you know, we can't build any more streets in this city. Part of the Strategic Transportation Plan was looking at traffic sheds. So where are we going to carry traffic? So if it’s not on Colfax, it's just going to go to 17th. We can’ widen 17th, and yada yada ... So the only answer is really increasing ridership and frequency of transit. Because Denver is going to grow and we’re going to get congested. And there is no way that we can get ... I mean in one bus ... we're also on Colfax doing a transit priority or enhanced bus, transit priority system. We've got about $4.1 million from what we call Senate Bill 1 dollars in the state. And it's mostly light timing and queue jumping and automated fare. But that would be the express bus, so for example from Fitzsimmons to Auraria. And a streetcar would basically replace the local bus. If you have shared lanes, yes there are some tradeoffs, but in my opinion, it's the only way we can really carry more people on Colfax. [BRT?] Well we're one step short. I was calling it Bus Rapid Transit and I think even the traffic planners were, but what they're realizing is that they don't have enough dollars. I had RTD in my office yesterday with our Denver traffic planners and Councilwoman Marsha Johnson who represents Colfax to the east of me and basically we don't have the dollars for the front loading and back loading for the sort of raised sidewalk type BRT technology. And unfortunately, they say they don't have the money for branding a bus. They have 22 buses that service Colfax for the Limited, and I was just saying, since they're going to have the special electronic device on the front that will adapt to the light timing, and let them get through a green light, so I was saying since you already have to make them special, and I had thought that that meant side boarding or side boarding or whatever it was ... but since they already have to be special buses anyway, why not brand them? And RTD is still pretty resistant to that. I mean, even special paint is like $10,000 a bus, I was asking these questions. And they're not quite ready to do that yet. But I think this enhanced transit or transit priority as we're calling it now, as long as it doesn't give too much priority to cars, because all I need is for cars to be moving faster along here. But the enhanced transit is a first step towards all of that.

How do you imagine the route along Colfax? Where would it start and where would it end?

Well the study area is from I-25 just west of Auraria to Colfax and
Yosemite. And so within that, the study will have to tell us... and I'm trying to think how long that is. It think it is about 5 miles, which is a pretty long first effort. So we'll have to get that figured out. And we were talking about it yesterday like you and I are, and thinking "well where will it turn around and where will it go...?" And so the answer is, we don't know. And so the rest of the study area is all the way from 12th Ave all the way up to 19th Ave. And I was sort of giving the consultants, not the consultants, the city planner; we have a new person who is in charge of this, but she knows a lot about the NEPA process and this is sort of a pre-NEPA thing. And she said you have to prove to them what the impact on other streets will be and you have to prove you've explored other options and this is the best option. So having that study area will eventually be to our benefit, if I understood her correctly. Terry Ruiter is her name. You should also speak with Jason Longsdorf. He used to be with the city, and now is with Parsons Brinkerhoff. HDR is bidding (Charly Hale and Reid Lee), Fehr and Peers: Jeremy Klop, and David Taylor of Seattle.

What is the reaction from residents in your district to the idea of a streetcar... is there strong support from some groups and strong opposition from others?

Oh they love the idea, it's sexy. I think when we're going to start getting push back is when we tell people they're going to have to pay for something, because you know we're probably facing a fast tracks election this fall, so. But really, our feasibility study, I'm starting to get a little more hopeful that in my lifetime I will see a streetcar on Colfax, but this is a very first step.

What is the reaction from businesses and the Colfax BID to the idea of a streetcar... is there support or opposition for particularly interesting reasons?

I'm sure they could be worried about parking, because parking is tight, and so could neighbors who are not convinced. We are going to have to remove parking, we don't know how much, I mean that's what we're going to find out. I think the newer businesses, the ones that are sort of hip, are excited and get it. But we are still faced with a lot of uninvolved property owners, and uninvolved businesses along Colfax. But the business improvement district, the Bluebird District is trying to form a BID. And the business improvement district in the section of Colfax where my office is has recently sort of reinvigorated itself. So we're starting to form the leadership it would take, but again, it's right at the beginning I think. And we've been talking about it since at least 2005.

What is the general feel when you discuss the idea of streetcars with your fellow City Council members or other members of Denver's government?

Very interesting... I've sort of beaten them down. It started with, in the beginning 6 years ago when a number of us got elected, Marsha Johnson to the east of me said, oh no, I want streamlined light rail, or she had another idea. And Carol Boygan who is a councilwoman at large and very savvy said, wouldn't a cute little bus do? Now Carla Madison has recently been elected and she represents the other side of Colfax from me and she's pretty enthusiastic about it. So it's...
pretty positive. Chris Nevitt, who represents south broadway is very interested in streetcar. He’s a big environmental guy.

I know you did a fair amount of work with Blueprint Denver, the comprehensive land use and transportation plan for the city. How does the idea of a streetcar fit into this plan?

Well, it’s all about land use and transportation. The sort of neighborhood retail and density that you need along our major corridors really meshes with the idea of streetcar.

Do you believe that streetcars could attract new development to the Denver region? (that would normally not occur here, or would it simply re-orient development from the Denver metropolitan area into downtown neighborhoods?)

If I’m understanding your question correctly, that’s pretty interesting. Because we get that sort of issue with the Tattered Cover moving from Cherry Creek to Colfax, and that’s without a streetcar. So I guess my philosophy would be, new areas develop, and it’s just a question of planning where you want to direct your growth. Tattered Cover moved up here and a lot of people in Cherry Creek miss it but the fact of the matter is something replaced it in Cherry Creek, so now we have two strong... Cherry Creek is really strong, and we are strengthening Colfax. So in some sense, I think it’s about directing growth than about replacing something. My feeling was that the Pearl District was so strong and wouldn’t be nearly as strong without the streetcar. I don’t know where it took the growth from. I don’t know Portland well enough to say whether it took growth from somewhere else, but part of the idea is you get to direct growth. And that connection with Portland State and the Pearl District with downtown in the middle is pretty terrific. [redirecting growth and easing pressure on existing neighborhoods] That’s a lot of what we talk about with Blueprint Denver and our new zoning code. You know, Blueprint Denver has areas of change and areas of stability. Because we haven’t implemented the zoning that would go along with that, we’re seeing more growth in areas of stability than we want to. So we need to do things like our Main Street Zoning to encourage the growth to go where we want it to. And when you realize that land use and transportation are connected, the streetcar also directs the growth as fastracks will. And it does preserve the other neighborhoods.

What are some potential barriers to streetcars in Denver?

Financing is a big one. The consultants that have been in to talk with me put it this way: ‘Where are the land mines?’ Basically I’m worried a little bit about the Colorado Dept. of Transportation because they are interested in moving cars on Colfax and Colfax is still a State Highway. That could be... our consultants are going to have to talk to them. The state could be a sort of land mine, even though right now we have an administration that is much more transit friendly than anything we’ve had in the past.
Could you tell me a little about the specifics of the RFP for the Streetcar Feasibility Study along Colfax . . . the boundaries, the scope of the project, etc.?

It is strictly a feasibility study. Can streetcar be put back in Denver somewhere, first on Colfax as an option, somewhere on the Colfax corridor? So the first place we're going to look is Colfax itself. But things have changed a lot since 1920 something since they stopped running them down Colfax. So is it feasible to put a streetcar in somewhere nearby if it is not feasible on Colfax? So the initial thing is, would streetcar work, and would it work on Colfax or another parallel street?

What are the boundaries of the study geographically?

The study area is 12th to 19th and I-25 to Quebec. So it is quite large. So if we decided a streetcar might work, it might not be, it may be a much smaller area. But those seem like very reasonable boundaries. Originally we were just going to go to Civic Center Station, but I don't know if you ride the light rail or the bus system in general, but Auraria provides a huge ridership base.

What is the scope of the RFP?

Is it feasible and where might it be feasible. Not so much what kind of vehicle, but what would be the range . . . what could the city look at in terms of a range of costs. So we're going to have them collect some basic data on the demographics, the kind of traffic use . . . traffic isn't quite the right word. I don't know if you've seen Denver's new Strategic Transportation Plan that came out in December? [yes] So you know that the focus is on people trips, person trips rather than vehicle trips. So this will also try to figure out how do we report that sort of measure. Since we haven't really relied on it, the traffic engineers are going to go crazy with it, I think it's great. So basic background information, do a preliminary identification of streetcar concepts, and then identify what would be a preferred alternative. Through this whole project, they should be . . . we should define criteria to weigh options against. And then those would be useable for future routes. One of the components of the final report will be an assessment of where else streetcar might link in . . . or what other directions might it go. It's really kind of, at that point, 'ok, we've decided a colfax area streetcar might be good here, where might it link.' But the criteria, when the city can get around to looking at another option, it would apply the same criteria to it. And there would also be a pretty good public involvement process. And usually the first task would be figuring out what the goals of the project would be.

I'm assuming that that would include an economic development component?
Most likely. The folks that are pushing it see it as a boon for economic development.

Who was involved in writing or drafting the RFP? How much was the City’s planning department or others involved ... how much input came from outside of Public Works in developing the criteria for the study?

I’ve been here 2 months. I’ve learned that the best thing to do is just write it and get it out, and ask people if they’d like to comment. I’ve asked several people for comments, but haven’t gotten any comments back in a month. So ... I’ve asked them to participate and everyone said they would. We’ve got the city planners, community planners and development folks, we’ve got the traffic people from public works, we’ve got the development people with public works, we have someone with RTD, and then the councilwoman who is really pushing for this hard wants to be involved. [is that Jeanne Robb?] Yes. They will be involved in the proposal review and the interview for the consultants. And as issues come up with the project, they will be involved. I don’t see people outside of Public works having a day-to-day involvement.

How would a streetcar on Colfax fit into the ideas proposed in the Strategic Transportation Plan?

I think transit generally ... increasing transit modes fits it well. I don’t know if you’ve looked at DRCOG’s projections, but they’ve projected another million people by 2035. And we have a lot of issues that go with that. One is that by that time, at least 30% will over the age of 60. We don’t have enough water to use at the same per capita use as we currently do. So those two things in particular lead me to believe that people will want to live closer in. And that is what we’ve seen. A lot of people just want to leave the suburbs, they’re not raising kids anymore ... that’s too bold a statement ... a lot of people I know who do have small kids want to be in the urban core more than out in the suburbs. So there will be a reverse migration into the city. So the STP says we don’t want to increase our footprint for roadways. And the only way you’re going to increase the number of people you move is to put them on the same vehicle. So a streetcar provides one more option for putting a mass of people in one place and moving them. The 15 and 15L are RTD’s highest ridership buses right now. So this would probably increase the capacity of a 15 equivalent.

How do you envision streetcars and the #15 interacting on Colfax?

I think it will come out in the study, but I would say that is one of the options ... that it would replace the 15. Not the 15L ... because streetcars stop more frequently. Riders on the 15L will put up with stopping occasionally, but once they hit Denver, once they get in the downtown area, they want to get downtown, they’re commuters.

Do you foresee any major barriers to a streetcar on Colfax?

I’m really trying to stay wide open and see what the study brings in. It’s hard not to I guess. when you see the street run as it does now, and if you’re on it pretty much any time of day, there are a lot of cars
on it. There are a lot more at some times of day and it barely moves. You really effectively shift that traffic. There's also a lot of parking on that street, what will streetcar do to the parking. There's not a lot of off-street parking available to people in that area if they're shopping or something along those lines. So I don't know. I'm trying to be really non-biased in the start of this.

**What is the timeline of the study?**

I'm hopeful that it'll be out this week, with a month to write proposals, we'll have a couple of weeks to review the proposals, notify folks of a short list, give them a week to get their stuff together and come in and present, then hopefully have an answer for them in a week. Then I'm assuming 6 weeks to get things negotiated and approved. The contract is small enough that it doesn't have to go to City Council to get approved. But I'm learning it takes a while. So August to get it kicked off and then 9 months for the study.

**What is the next step beyond the feasibility study?**

There are currently several options for funding. You can do it all locally, you can. The state has just taken a harder look at in-state transit. Although RTD is probably going to be more exempt from that from participating in that b/c it functions in a region already, and the state dept of transit will really focus on those outlying regions that want to be able to get on a bus and go to the next town over and don't have the service and don't have the demand for an individual entity to take it on. It makes more sense for the state to do it. The federal program through New Starts, through small starts and very small starts are designed to support streetcars, somewhat, although they've not done it yet. Although they were designed with streetcars in mind. So in 9 months we might have. More like a year from now, we may know where the transportation will be going. I know before the election, the FTA was really scrambling to try to encourage transit agencies to apply for funds because they didn't know what a new administration would do. The indications coming out of Congress now and out of the new administration are that transit will be pretty well supported. So I think they're feeling a little more comfortable with that. But who knows, it's kind of a crap shoot right now.

**What would be the criteria that you would use to determine whether or not a streetcar on Colfax was a success, if one was implemented?**

That's part of the project: developing those criteria. Maybe the second part of the project. The first part is determining whether it is successful, and then the second part is developing those criteria.

**Where else in Denver could you imagine streetcars?**

Broadway is always kind of interesting, although I think the bus service works pretty well up and down it. I think Downtown... one of the things that I think the Portland streetcar has going for it is that it is all on one ways. We pretty much are as well... but it flows well because it is on a loop. I know there is interest in going out Speer...
along Cherry Creek and to Colorado Boulevard. Maybe Evans ... catch DU on one end and link in to Light Rail on the other end.

The STP mentioned something about Leetsdale, which was surprising.

I read that as well and thought,'so what were you smoking?' I have another project that is coming up soon, it's the Eastside Corridor. The STP ended it at Alameda I think, and we're going to take it to Leetsdale, which I think is a more logical grouping for that East Side. It's always been a mess as a road... and I don't see streetcar ... unless tying it into Cherry Creek, I don't see Leetsdale on its own as a very logical place for it. Other than it's just a horrible place to drive. I think there are ... the reason I wanted to include it on the East Side is there are a couple of neighborhoods that go across Alameda and almost reach Leetsdale ... but there are only two of them I think, and they are associated with the bigger mass of neighborhoods to the north. It's kind of a dead end to the north because it cuts across the city at a diagonal. I could sort of see it as an end-of-line if you have something that starts out on first and then heads out Alameda ... but barely.

I was sifting through some of the response to the Strategic Transportation Plan and came across Randall O'Toole's comments (with the Independence Institute). What is your response to his opposition to streetcars along Colfax, which is based on the current high traffic counts and the fear that they would slow traffic along this corridor?

Randall O'Toole doesn't believe that public transportation has a place in modern life, period. He and John Coltera are the only people I've ever heard say that sprawl is good and would dissipate air pollutants rather than condense them, even though there is mounting evidence over the last hundred years that the opposite is the case. So I'm somewhat biased in what he writes. I think he's crazy. I don't see that he provides any numbers that really demonstrate his point ... I mean he uses numbers that can be used any way ... I just think he is wrong.

How do you imagine the route would take place?

I don't have any idea. That's what the study is for. I should also say that we do anticipate looking at several options, because federal money is in the mix, if we decide we want to go that route, everything we do in this project, I want to be applicable through the NEPA process and beyond. So we will have the public involved up front, we will identify a reason for doing this project, which hopefully will carry over as a purpose. It behooves us to not avoid any of those steps. And we may come up with a better answer, but .... I should go back, one of the areas that I expect the criteria to include is environmental issues. So we don't choose something just for cost and engineering, and somehow then eliminate the least environmentally damaging option that may cost a little bit more but we would be a little better off having selected it. So SAFETEA-LU has finally allowed inclusion of earlier studies as the decision process continues, and one of the reasons that federal agencies have been so irritated at including major investment studies and some of the other earlier studies as appropriate stages is because they've never included much
environmental consideration at all. “Eh, we can culvert that stream . . .”
Uh, not exactly guys.

Do you foresee many major issues on Colfax?

Not really, but I want them to be looked at. And there will be benefits
too. If we’re really getting a million people, and if everyone of them
hopped in their car at 8:00 in the morning, five days a week, the air
emissions would be much higher than if they hopped on a streetcar.
Notwithstanding that someone is finally going to make them clean it
up or burn gas more efficiently.

I’ve come across some major technology advancements . . . hydrogen
fuel cell streetcars or underground third-rail technology. Some of
the criticism of streetcar is that it takes electricity during peak load,
etc.

I’ve heard discussions and I kind of challenged the guy on it in 2002,
the guy who was allegedly leading GM’s sustainability program I say
allegedly because I didn’t think much of it. This was right after CAFE
standards. It’s seven years later and it’s still 20 years out. From our
standpoint, we’re not looking for something that is twenty years out.
We’re looking for something much more useful. I’m pretty sure they’re
not going to be interested in something that is unproven. It’s a mode
that gets used well where it is implemented. They do have a track
record (sort of a pun), in this country and certainly in Europe, Japan
has trams all over the place. Its a well used mode where it operates.
So they don’t have to fret about that. There are several features of
modern streetcars that make them probably a better sort of transit
machine than historic ones, but I don’t think an alternative fuel source
or power source that hasn’t really been proven is what we’re looking
for, when cash is an issue.

What is general opinion of people at Public Works about the
potential for a streetcar on Colfax . . . apprehension, optimism,
doubt?

A lot of rolled eyes? No, I think their feeling is . . . and it depends on
who you talk to. The parking guys say we’re going to have to figure
out where to park those cars if you take parking places, and the city
is already strapped for parking. Now at least I don’t get the argument
down there that you’d lose money. There are a few meters on Colfax,
but not many. So we’re not losing a big finance source that way. The
traffic guys are concerned about what it would do to traffic . . .
how would we set up this lane? It’s gonna be run assumedly in traffic
as part of the traffic flow, but it’s going to stop every block and let
people on and off. So what does that do to the flow of the right lane
or the center lane? I have no clue where we’re putting it. Every time
I assume it is the right lane, someone says, ‘but we could run it down
the middle.’ So then you take all the left turns on Colfax . . . what’s
worse? So I don’t know what they’re feeling ultimately will be until
they have several options presented to them. I would say in general
that folks here are pretty open to thinking about alternatives. I don’t
think it’s dead in the water by any means. But I think they want to see
something specific.
Have you heard of the park-once philosophy and do you think that could be a good strategy for a streetcar along Colfax?

It does need some thinking ... where is that one parking place. It'll take some analysis and some comparison of places like Portland. Colfax is just lined with small businesses and to a large degree the street parking is their customer base. I think an interesting test will be Argonaut Liquors. If you recall, they had a big old store with a parking lot that wrapped the store. They just built a new store much closer to the street, and the city is requiring them to reduce their parking.

My experience has been, because I lived south. When we drove, we'd route be Argonaut and at 5:00 it was full. So it will be interesting to see what this does to their business. It's really not a neighborhood business; it's really an East Side liquor store.
Interview with Patrick Sweeney, Portland Department of Transportation  
Date: March 13, 2009  
Type: Telephone interview

I'll be looking at Portland and Seattle's streetcar lines as case studies.

What's interesting about Seattle is that they had electric buses for a long time and yet their building streetcars, which is a great way for me to counter the argument that I get locally here that is, "Why don't you build electric buses? They're a hell of a lot cheaper." And it is because they don't have the value capture that streetcar does...the economic development isn't there.

To start off, I thought I'd ask about how Portland arrived at this multi-phased Streetcar System Planning process. Do you think the existing streetcar line needed to be operating (and operating successfully) in order for it to take place?

Well, actually the need for a system plan arose after the first streetcar line was up and operating. And when people saw it...the story goes something like this, that after it was up and running, then commissioner Charlie Hales had knocks on his door from other neighborhoods on the East side of Portland across the Willamette River, that said 'we want to be the next one.' And so he had a few of these requests, but there was no logical study or analysis to arrive at "ok, what makes sense for what corridors, how do we evaluate, and how do we rank them?" So that helped build the need for a streetcar system plan so that we can evaluate and identify future corridors for further study. It was really the success and popularity of the starter line led into the need to develop a system plan.

Do you think a city could start out with a city-wide streetcar system planning process without a streetcar in place and receive the same level of public involvement that you have seen with the District Working Groups? Would the public be able to fully understand the limitations and opportunities of streetcars without having experienced them in their city?

It's always interesting that we had a streetcar and we extended it three times and now we finally have a system plan. But it's such a new and unique thing that exposing people to it and experimenting with it and evaluating how it performs is a really important first step before deciding that maybe we should look at these citywide. The streetcar has been enormously successful for the city of Portland, but there are still a lot of people in the city that don't get it, who still think that it's too expensive, that still say, 'oh, just build a bus, you're getting the same thing.' We have the urban growth boundary in the region, and that's the real reason why our main streets are booming. It's because of the urban growth boundary, it has nothing to do with streetcar or some other kind of strategy. It's really a combination of all of those. Streetcar happens to be the most tangible element that helps to organize and optimize development. Development is still occurring along main street, but could it occur, but could development be optimized to the level it's been optimized downtown? Are you familiar with any of the Eric Hovee reports on economic development on streetcar corridors,
within 1-3 blocks? [yes] So you've seen that you can get 90% of the FAR within a block of streetcar. Since 1997 55% of all the development in the central business district of Portland has been within a block of streetcar. It has this enormous potential to draw development to it, and not only draw the development but also actually then max it out. [And then use the development to help support it financially] Yes, where that can work. So that's worked in the central city, where property values are high and where the local improvement district, where there is a one-time assessment of property owners to help chip in and pay for the infrastructure. So I mean, that works. But where property values are high enough to generate enough money. But outside, going out into neighborhoods, regular old neighborhoods where property values are much lower; we don't know how we are going to generate local match yet. And that's something that is going to be a follow up study, a more detailed financing study to determine how we generate local match or explore local match options.

Reading through the screening and methodology report by URS, it seems very detailed and comprehensive. Has all the data been collected and analyzed that was recommended in this report through the current phase?

We're actually working with them to do a summary of the three phased screening process so that we can see the data of how that all led to conclusions per phase. It hasn't been put into a report yet but we're working on it. We're into phase 3 now.

Moving into the public involvement phase of the Plan, given that many of the streetcar advisory committee members are not transportation experts but residents, property owners and business owners from the neighborhoods, how important was the background information (in the form of the workbook) that you gave to committee members?

Yes, that was a major element of Phase 2 was, you know, one of the the three criteria for evaluating streetcar corridors was ridership, development potential and community support. So the community support piece led to the whole District Working Group effort. And that's where we had these citizen sub-groups. 85-90 people working city-wide, volunteering to evaluate potential streetcar corridors in their areas of town. That was the biggest push of public involvement was in that piece. So now we're taking that information and we're going to be using it to set priorities once we have our final set of corridors. I would say more positive than negative on the workbook. We were trying to give citizens a tool to help them learn and discuss about streetcars. While I think we were able to cover some of the transportation issues well, we're the transit agency, and we could have done a better job with the neighborhood side of the issues. Because the streetcar corridor; only half of it is the streetcar; the other part is the streetcar neighborhood. It was positive; it was well received. There was some push-back that said it didn't go enough into the issues, but it just glossed over some of the issues. For instance increased housing prices, increased lease and rental rates for businesses, that kind of thing. I'd say one of my biggest recommendations for other cities that are going to do a streetcar system plan is to co-manage it between transportation and planning. Because it is a much about building up...
the neighborhood and economic development around the streetcar as it is about figuring out where the best place is to put the corridor.

So Portland Planning wasn't involved as much as you would have liked?

No they were involved enough, but we certainly didn't co-manage the project. Now, as I'm getting close to the end, after 2 years of being into it, if I were to do it again, I would have it co-managed.

Where there any major differences in the level of support or opposition to streetcars in districts that differ demographically--according to median income, age, or race?

We used survey monkey as a tool for these assessments of public support, and then we relied on the DWG members to help broadcast the survey both electronically by emailing the link and by paper copying and that kind of thing. So the survey went out to as many people as the volunteers got to, and by as much time as they spent. By no means it is scientific results. Its' just a non-scientific assessment. So to say that we accurately covered a cross-section of the community - I can' say that. But we did make an effort to try to capture different household groups and different cultural groups. We did have some success. I forget what the count was. I think we had 14 Chinese translations, 10 Vietnamese translations, 2 Russian translations. We set up a phone number and a service that if you needed it to be translated, you could call and have the survey translated to the language you requested. So we had 25 of the more than 2000 that came back used the translation service.

What groups were most supportive of potential new streetcar routes through their neighborhoods ... residents, businesses, renters, local politicians?

I'd have to go back and look at the data. Overall it almost averaged 80% of respondents were interested in the city studying future streetcar corridors. It dropped to, I think, 65% (somewhere in the 60s) for East Portland, which is the area that was annexed into the city in the 1980s. It's mostly an auto-dominant suburban area. It is the area of Portland that is most unlike Portland, within the city boundaries. It is more like a traditional suburb.

How much has a fear of disrupting existing stable neighborhoods (with new development, increased noise, parking reductions, construction, local improvement district taxes, etc) has surfaced through this process? And on the flip side, how much has a desire for increased development and transportation options surfaced?

I never really heard that as much as I thought I was going to, because I think people were enthused about the potential amenities that could be coming their way that come with the streetcar and intensification of the commercial corridor that it would arrive on. The push back that we got on density was from East Portland, the area I just described, because they have been receiving a lot of density, a lot of high density development already, without a balance of the amenities that build neighborhoods. So they were nervous about getting more density with
a streetcar corridor and not getting the full neighborhood services that go with it.

I am interested in discovering what the potential is for streetcars to return to historic streetcar suburbs, particularly in Denver. The maps you have provided on your website that show the historic 1912 lines and the historic streetcar neighborhoods in Portland are really interesting! In speaking with a few people in Portland, it seems as though some of the “up-and-coming” neighborhoods in Portland were once streetcar suburbs and are interested in seeing the streetcar return (based on the District Working Group’s report). What do you think the key factors are for historical streetcar suburbs that want to see the streetcar return and are those factors any different from non-historic streetcar suburbs?

The benefit of the historic streetcar neighborhoods is the framework, the urban form is most likely already there, so it feels like a main street where streetcar would want to be. Because ideally, you want to put a streetcar where people want to go to. It is kind of the attitude that you always put transit where people want to be, so the same applies to streetcars. So the old streetcar neighborhoods have that going for it. The street it typically at the right scale because it runs with traffic and stops traffic so it adds to the pedestrian nature of the street. So the old streetcar neighborhoods have more inherent right of way that lends itself to that kind of neighborhood, main street feel. And a new suburb, there are advantages and disadvantages. The advantages are you probably had a wider right-of-way which could help to manage the potential conflicts with operations of everything that needs to go in there, so like bikes, cars, trucks, streetcar, and so on. But the problem is you might have a more suburban type of land use pattern with a lot of parking lots between the streetcar and the buildings and then you’re going to need a lot of parking lot access, which isn’t necessarily a huge issue for streetcar, but it makes it a little more complicated. . . . Ultimately, are the citizens willing to financially support the implementation for the streetcar; because these things are expensive and for cities to implement them, they . . . if you can come up with your own funding strategy for a really short line, that’s great. but if you’re going to go for federal dollars, generating the local match is really important.

What have been the most surprising results working with the streetcar advisory committees?

One of the things that surprised me the most was how willing citizens were to dedicate a lot of their time to looking at this issue and this topic. I mean I was just blown away by how much time these people put into it. I think of myself if I volunteered and I thought, oh my god, I’ve got enough on my plate already. More evening meetings, more doing independent work, more collaborating with your neighbors, and all that and I think, wow. I’m biased because this is what I do for a living and I get burned out when I go home. So the level of citizen interest was really exciting. The other part that surprised me was how quickly people went to recognizing the green benefits of it. I mean I didn’t really try to sell it on that very much but they brought it back to me. I think a lot of that had to do with our streetcar system planning effort occurring when gas prices were super high. And I think
that led to people thinking that we need cleaner greener choices and this makes a whole hell of a lot of sense right now. [not just because it's Portland and is known as the greenest of all cities or …] Yeah “We are Portland and we deserve this now!” no …. actually … there are a lot of people that would say there aren’t streetcars here for a reason and that’s because buses are cheaper and more flexible, so what’s your case for suggesting they might come back? And you know you say buses are a solution to a transportation problem to move people from point A to point B independent of a car, but the streetcar for the city of Portland has achieved multiple objectives of being an urban neighborhood circulator but also as a long range economic development tool. So we’re building neighborhoods where more people can live that can absorb future population growth in higher density, very walkable areas. So we’re building neighborhoods that rely less on the car and at the same time we’re preserving the existing single-family neighborhoods we have now from infill pressure as the city continues to grow in population. So we’re trying to concentrate growth on the streetcar corridors by building these streetcar neighborhoods that are highly walkable and connective and you can get everything you need, they're very accessible.

The screening and evaluation methodology report describes a very comprehensive measurement of current housing densities and future potential for redevelopment along potential corridors and within a 1/4 mile radius. Can you talk a little about the residential density or commercial density (or a combination thereof) necessary to support a streetcar route and does that density need to be existing, planned or a combination thereof?

I don’t have the answer to that yet. I’m hoping to uncover just that topic as part of the implementation strategy that we’ll be getting into next month. So my answer to that is stay tuned.

What do you think is a reasonable amount of traffic flow on a street that might add a streetcar route?

We would be looking at it not from traffic flow but from … we need to develop a threshold for are the ideal densities and square foot of retail. Did you see the Primary Transit Index Report? [i need to look into it more] That really got into identified putting a hierarchy on transit supportive corridors in the city and it concentrated on retail and household employment densities and it mapped it out. So that was really the basis of evaluating the transit supportiveness of all the transit corridors and was the foundation of figuring out which of the corridors to start looking at. In other words, to narrow the universe of options of where to put streetcar or where a streetcar could go.

Which was narrowed down and given to the DWGs?

Yes, which was narrowed and narrowed and narrowed … right.

During my research, I have noted many key elements that are discussed around the topic of streetcar system design: public support, system-wide connectivity, linkages to key destinations, economic development potential, affordable housing, neighborhood walkability, commercial activity etc… If you had to narrow it down to three or four of the most important, essential elements when planning a streetcar corridor, what would those be?
Key elements when planning or identifying a streetcar corridor... One I would say is existing transit ridership. You definitely want more than 3000 riders a day averaging in the corridor. And you want the ability and the entitlements for mixed-use, higher density development zoning with retail, and you want to try to connect ... you want to have some anchors along the corridor, either at bookends or along the way. Because you want to make sure you have good ridership generators along the way. So Portland’s first line connected a significant employer, Good Samaritan Hospital, with Portland State University at each end, and then it went through a major development area in the middle. So it was strategically planned to have big ridership generators at each end and it’s going to go through a completely new redevelopment area, which is the Pearl District, and low and behold it all worked and the Pearl district blossomed.

Do you think that because it was also connected to major bus routes and light rail lines downtown it increased overall system ridership?

Oh yeah. Being integrated and having a high degree of connectivity to other transportation options it just lends itself to it. What’s really interesting about the streetcar ridership levels to date is that we’re in between, close to 12000 riders per day M-F and the Sat ridership is around 11,000. So the off peak hours on Sat and streetcar ridership is almost as high as it is on M-F which is when we have the most people in the CBD. And the other weird part about streetcar ridership is that its peak is at lunch, it’s not the peak hour am or p.m. So people are using it to get around and circulate around the city for short trips, which lends itself to the idea of future streetcar neighborhoods where people don’t need a car as much, [just for errands] thus building up more walkable neighborhoods. What’s really interesting about the Sat ridership numbers is, one of the trends or the patterns we’re seeing in the “park once philosophy”. People come downtown for their Sat city experience and park once and use the streetcar to get all around the downtown area. It really lends itself to the “park once philosophy” and then use transit to get around.