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Examining the Development Effects of Modern-Era Streetcars: An Assessment of Portland and Seattle

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MINETA TRANSPORTATION INSTITUTE

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REPORT 18-09

EXAMINING THE DEVELOPMENT EFFECTS OF MODERN-ERA STREETCARS: AN ASSESSMENT OF PORTLAND AND SEATTLE

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16. Abstract

Most U.S. cities pursuing streetcars are doing so primarily for their purported development effects, as opposed to for their transportation role, yet there is little evidence about the nature or magnitude of these development effects due to a scarcity of rigorous, empirical research. Most available work simply presents descriptive information about development outcomes (typically measured as changes in population, employment, land values, or permit activity) within streetcar corridors as indicators of the streetcar's development effects. Alternate factors which may have influenced such results are often not considered, placing into question the validity of such measures.

This study examines the development effects of streetcar investments in two U.S. cities that implemented streetcar service between 2000 and 2010: Portland, Oregon, and Seattle, Washington. The authors explore the development outcomes (here measured as the number of permits issued) through a combination of statistical analysis of development activity in the streetcar corridor and interviews with key streetcar stakeholders. The statistical results indicate that areas around Portland's initial streetcar line experienced higher levels of development activity (more permits issued) than areas not served by the streetcar, although the differences in activity between served and not served areas since the opening of the second line have been insignificant. In Seattle, the areas around the streetcar line in the South Lake Union neighborhood experienced greater commercial development activity (commercial permits issued) but less residential activity than nearby unserved areas. The interviews provide important local context for the interpretation of the empirical results and highlight the continued importance of development as a rationale for streetcar investments, as well as to the limitations of the streetcar as a transportation service.

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EXECUTIVE SUMMARY

Streetcars once dominated the streetscape in major American cities. During the first half of the last century, as their ridership declined, the fixed-route streetcar systems in most cities were dismantled and their services replaced with flexible bus transit services that were seen as a more economical fit for the increasingly decentralized metropolitan landscape. Yet many cities are putting streetcar systems back into the urban areas which they once served. Hundreds of millions of federal, state, and local dollars have been expended to do so. Yet while the streetcar is a transportation technology, most of the cities implementing streetcar systems are doing so for primarily developmental reasons. They hope to replicate the experiences and obtain the same development outcomes as streetcar cities such as Portland and, to a somewhat lesser extent, Seattle. Thus, a better understanding of the reality of these cities' experiences is critical.

Portland's widely-heralded streetcar system includes a north-south line on the west side of the Willamette River running through the downtown; this line was the original streetcar line opened in 2001. It is this line which runs through the redeveloped areas that have received much of the attention of outside observers. The system also includes the Loop line, which opened over the past several years in stages to eventually provide service connecting both sides of the Willamette River. The development pattern on the east side of the river differs considerably from that of the higher-density development on the west side of the river, with development of a much lower density present there. Seattle's streetcar system also consists of two lines: South Lake Union (opened in 2007) and First Hill (opened in 2016). These two lines are presently disconnected, although there are ongoing efforts to try to connect them. In Seattle, the South Lake Union area has experienced significant development activity in recent years.

With this study, the authors sought to better understand the intricate relationship between streetcar investment and development outcomes. Understanding this relationship is particularly important because it is the anticipated development impact of streetcars that is the primary factor leading many communities to pursue the implementation of such systems. This study differentiates itself from previous research on streetcars and development by accounting for many of the other elements, including various development incentives, which aid in the stimulation of development activity within streetcar corridors. The authors examine development activity within the urban cores of Seattle and Portland, comparing development activity within the urban core, as measured by frequency of issued permits, between streetcar service areas and similar areas not served by the streetcar.

The authors anticipated that differences in development activity between streetcar service areas and non-service areas receiving development incentives would be insignificant. The authors also suspected that the development incentives present within the streetcar corridor would be primarily responsible for observed development outcomes. Findings in Portland and Seattle only partially support the stated hypotheses. The analysis of development activity associated with the initial Portland streetcar line showed development activity to be heightened within streetcar corridors. It is estimated that the initial streetcar corridor was issued roughly 45% more residential and commercial permits when compared to non-service areas that also received development incentives. Similar results were found

when comparing the issuance of commercial permits within Seattle's initial and expanded streetcar corridors to non-service areas. In these cases, it was estimated that streetcar corridors were issued over 50% more commercial permits.

The results changed when the focus became the expanded Portland streetcar system, including the second line. When comparing the issuance of residential and commercial permits between streetcar corridors and other areas within the urban core, no significant differences were found. This consideration suggests that areas within the urban core experienced similar degrees of development activity, regardless of the presence of the streetcar or other development policies, within the specified time span. In Seattle, the findings suggest that the streetcar is associated with increased commercial development, particularly in the South Lake Union area. However, it was also estimated that areas not serviced by the streetcar were issued, at minimum, 59% more residential permits than areas serviced by the streetcar. This consideration suggests that residential development was occurring with greater intensity in non-streetcar service areas.

Collectively, these findings call into question the consistency of development effects associated with the presence of the streetcar. The attainment of anticipated development impacts is not always guaranteed. If the achievement of development goals is driving the pursuit of municipal streetcar projects, which the interviews strongly suggest is the case, the implementation of alternate incentives for development should also be considered. The use of such incentives might produce heightened development outcomes which could equal or exceed the outcomes produced as a result of streetcar investment. Such initiatives could aid in the pursuit of development goals and have a lower cost associated with their implementation.

Lastly, the importance of treating the streetcar as a transportation alternative, not just as a development stimulant, is a major lesson highlighted within this study. Portland serves as an example of how this understanding can contribute to the ability of the streetcar to meet both transportation and development goals. In Portland, the streetcar is considered by many to play an active role in addressing their travel needs. Unlike other American streetcar systems, the majority of passengers of the Portland streetcar are residents commuting to school or work. This detail may be surprising to some observers due to the inherent limitations of the streetcar as a transportation option. The integration of the streetcar with the larger transportation network is something which may help to address these limitations. In Portland, passengers are able to use light rail and bus service in conjunction with the streetcar when making longer trips that would not have been supported with the use of the streetcar alone. This activity can contribute to the attainment of higher ridership levels seen in Portland.

Heightened usage of the system can also aid in the attainment of development goals, as served properties begin to enjoy more of an accessibility premium that is reflected in land rents. Attracting residents to development along the streetcar is easier when the system can meet their transportation needs. These findings in Portland stand in contrast to Seattle, where the streetcar system consists of two disconnected lines that do not seem to be attracting very many regular users because of their inherent limitations with respect to speed, reliability, and geographic reach. Some Seattle observers hope that the

construction of the delayed connection between the lines might make the entire system more attractive to users, but construction is as yet uncertain.

The lesson from Portland's experience seems to be that the more effective a streetcar is as a transportation service, and the more it is used by patrons, the more likely it is to have development effects. Simultaneously, a streetcar alone is not a guarantee of positive outcomes, as other factors such as a healthy real estate market, land availability, development-supportive zoning and other policies also need to be present. Cities that are operating streetcars or contemplating making a streetcar investment would be best served by keeping these issues in mind when making their own decisions.

I. INTRODUCTION

While it has been roughly 100 years since the heyday of the streetcar, streetcars are now experiencing something of a renaissance. Many U.S. cities are putting streetcar systems back into the urban areas which they once served. Hundreds of millions of federal, state, and local dollars have been expended to do so. This expenditure has resulted in streetcars becoming a more common public transportation mode, with more than a dozen streetcar systems in operation and additional systems now being built or in various stages of planning or construction.

The streetcar's return is confounding for some observers, as streetcars do not tend to perform favorably, as transportation services, when compared to other transportation modes, whether rail or bus. Streetcars tend to attract less ridership than heavier rail options (light rail, heavy rail, commuter rail) because they travel at slower speeds (roughly 20 miles per hour slower); they operate less frequently; and they are more exposed to congestion due to their frequently shared rights of way.[1] Streetcars commonly travel with automobile traffic on local streets, while heavier rail options regularly travel unimpeded via their own dedicated alignment. Streetcars also tend to have less capacity than heavier rail options and frequently operate as urban circulators over very limited geographic areas.[2] These factors can contribute to lower than expected ridership numbers, especially when compared to heavier rail options with greater geographic reach.

Furthermore, in addition to having significantly higher capital costs associated with construction, most streetcars also experience higher operating costs, are less productive, and achieve lower ridership per unit of service than local bus service.[3] Due to these numerous perceived deficiencies, streetcar critics tend to favor the development of bus or bus rapid transit service instead. These critics claim that buses can provide similar or even higher quality transportation service than the streetcar while doing so at a lower cost.[4]

If the transportation performance of the streetcar is frequently questioned, then why are they being so aggressively pursued by local officials in many cities? In most cities, streetcars are not being pursued primarily for the transportation benefits they might provide but instead are being sought for the benefits they might provide with respect to development and/or place-making.[5] Many streetcar advocates hope to use streetcars to revitalize their downtowns and/or nearby neighborhoods and transform them into economically dynamic, attractive, walkable places that are desirable locations for developers, businesses, and residents. These advocates have pointed to the experience of Portland, Oregon, as a model of the potentially transformative development effects of the streetcar, and they hope that building their own streetcar might enable them to replicate this experience.[6]

This paper examines the experiences of both Portland and Seattle in order to better understand the nature of development activity around their streetcar systems, as well as the policy and program supports and other factors that have played key roles in their experiences to date. By highlighting the experiences of these two cities, it is hoped that other cities contemplating streetcar investments might draw their own relevant lessons. The authors use a combination of statistical analysis of development outcomes and interviews with key stakeholders to better understand the role of the streetcar as well as other factors in producing these development outcomes.

The contents of the report are organized into several sections. In Section 2, the authors present a literature review to provide background information for the present study. Section 3 introduces the case study cities. Section 4 presents the quantitative analysis of their development outcomes. Section 5 presents the insights from stakeholder interviews about their perspectives on the streetcar and its development role. Section 6 provides lessons from the research for policy, practice, and scholarship.

II. STREETCARS AND DEVELOPMENT

Given that promoting development or redevelopment activity looms large as a motivating force behind streetcar development in many U.S. cities, it is important to understand what is known about the streetcar's role in development and what remains to be learned. The first point to be made is that there are few rigorous studies of the development effects of the streetcar. Most published studies have been purely descriptive, making no effort to control for other factors beyond the streetcar that might have also influenced development activity. The most widely cited streetcar and development study[7] relies on such a descriptive approach to identify development activity within walking distance of the streetcar in Portland, leaving the reader with the impression, whether intentional or not, that the streetcar is the key factor in stimulating this development activity. Indeed, an important limitation of much of the empirical work published to date is that it does not control for other factors that might also contribute to the observed development outcomes.

More rigorous work on different aspects of the streetcar-development relationship has only just begun to appear. Among these newer studies is work by Nelson and his co-authors that has explored the streetcar's influence on various aspects of development activity.[8] Yet while there is increasing recognition by the academic community of the need for more rigorous investigation, this literature remains relatively underdeveloped. In the paragraphs that follow, the authors briefly discuss what is known versus what remains to be learned about the streetcar and its potential role as a catalyst for development activity.

RAIL TRANSIT AND DEVELOPMENT

Much of what is known about the streetcar's relationship to development originates in the extensive literature on rail transit and development. This literature focuses principally on the development impacts of heavy rail (subway or metro) and light rail (tram) transit on employment, population, land values, and other indicators of development activity. The logic underpinning this literature, and indeed all work on transportation and development, derives from economics. The premise is that when a transportation investment provides increased access to an area, the increased access becomes incorporated into higher land values, which signal to developers and other actors that they should increase their investment in the location. The result of the enhanced access provided by the transportation investment is thus increased attractiveness for the location being served as a place for developers, businesses, and/or residents to locate themselves. A transportation investment can have this kind of transformative effect to the extent that it provides an accessibility benefit to a location and that people can use the transportation service to reach the location. This kind of effect can occur whether the transportation investment is a road, rail line, airport, or any other transportation facility.

While there is extensive literature attesting to accessibility-associated development effects of heavier rail transit investments,[9] the question is to what extent the lessons derived from that body of literature are applicable to streetcars. Streetcar advocates tend to highlight the similarities of the streetcar and these other transit modes, while streetcar critics tend to emphasize the significant differences.

With respect to similarities between the streetcar and heavier rail modes (like subway/metro and light rail transit), the most important similarity is that all of these modes are fixed-route services. The fixed-route nature of the service lends a sense of permanence to these investments, and this permanence has been noted in interviews with developers as providing reassurance to them that it is now safe to make their own investment in a particular location.[10] Developers have reported that the fixed public investment in infrastructure provides a degree of comfort when deciding to make their own private investments—comfort that would be lacking were the public investment to take the form of something flexible and potentially movable like a new bus route. The streetcar thus might be a development catalyst to the extent that this view of its permanence influences developers' decision-making.

Another similarity between streetcars and other rail modes is their shared ability to tap into the more positive public attitudes, and in many cases the sense of nostalgia, around rail transit that is notably absent from bus services.[11] This positive attitude toward the streetcar might provide a spillover benefit of enhanced desirability onto a neighborhood that is served by rail which might in turn result in increased land values due to the increase in desirability of the location. Some previous research has reported on the positive views that residents and business owners have expressed toward streetcars serving their neighborhoods because they believe the streetcar contributes to a sense of identity for their neighborhoods.[12]

In addition to similarities, there are important differences between streetcars and these other rail modes that should cause one to be cautious about assuming that similar development results might be obtained by streetcars. Most notably, the quality of the service, and hence the nature of the accessibility, that streetcars provide is different from that provided by many other rail modes. Where heavier rail modes typically run at high speeds, travel unimpeded on dedicated rights of way, and operate with more widely-spaced stops, streetcars often run at slow speeds, travel in mixed traffic where they are subject to conflicts with other vehicles, and operate with frequent stops.[13] These factors reduce the time savings a rider would enjoy by taking transit, as they are subject to similar speeds and conditions as they would experience by driving or taking a bus.

Another of the key differences between streetcars and heavier rail modes is the operational nature of the streetcar. Streetcars typically have short alignments, serve shorter trips, and have more limited passenger carrying capacity. The heavier rail modes typically serve longer distance trips, carrying large numbers of passengers. Streetcars tend to have lower carrying capacities than heavier rail options, and they frequently serve as urban circulators operating in very limited areas. Heavier rail options usually operate within a more expansive network and can carry up to 70 more passengers per vehicle than a streetcar.[14] Heavier rail modes tend to serve commuting and utilitarian trips, while streetcars tend to serve primarily discretionary and visitor/tourism trips.[15] The limited network and capacity of the streetcar limits the number of passengers it can reach and accommodate, which can contribute to lower than expected ridership numbers, especially when compared to heavier rail options. Lower ridership means few people are availing themselves of whatever accessibility the streetcar provides.

In short, both the quality of the service and the numbers and types of passengers served are potentially significantly different between the streetcar and these other rail modes. This consideration has important implications for the type of accessibility benefit a streetcar might provide to an area that it serves. In practice, many streetcars are actually much more similar to local buses in the quality of service and level of accessibility they provide than they are to these other rail modes.[16] Since the ridership potential of rail is something which attracts developers, the capability of streetcars to attract significant development should thus not be considered a guarantee.

Attempts to translate the development impacts of heavier rail onto the streetcar are commonly made without acknowledging these key differences, which may compromise the comparison. Factors which attract developers to locate near a rail system include the promise of greater accessibility, exposure, and foot traffic. Ridership needs to be high in order for developers to experience such benefits. The expansive network, greater capacity, frequent service, and high speeds of heavy and light rail attracts such ridership levels as they serve as feasible transportation options for a wider array of travelers. By contrast, operational and physical characteristics of the streetcar may limit its ridership potential, thus limiting its potential to attract development.

Yet some observers have pointed to these apparent streetcar deficiencies (as compared to other rail modes) as being positive attributes, as streetcar passengers traveling on the slower mode with its more frequent stops can more clearly see their surroundings, and they might thus decide to stop at local establishments along the line mid-trip.[17] This behavior might then turn streetcar riders into potential consumers for streetcar-adjacent development. Such activity is perceived to then “activate” the sidewalks, which can in turn spur additional development along streetcar corridors.[18] For these and other reasons, some observers are convinced that the streetcar is imminently capable of stimulating development; encouraging outside investment; attracting new residents, businesses, and industries; increasing property values and the local tax base; increasing tourism; and strengthening the downtown.[19]

The streetcar once allowed people to move farther from the unpleasant living conditions of the urban core and find solace in new suburban communities. Today, the streetcar is largely being promoted to accomplish the opposite end. Many cities are explicitly using the streetcar as a tool to attract people and business back to their urban core. Yet integrating a streetcar system into today’s urban environments requires considerable investment. The cost of constructing a streetcar line can reach hundreds of millions of dollars. Justifying this level of investment on cost-benefit grounds is challenging, and it becomes practically impossible without the anticipation of significant development effects. While the benefits associated with mobility improvements and travel time-cost savings are limited due to the slower speeds, infrequent service, and lower carrying capacity of the streetcar, a recent evaluation of streetcar proposals found that approximately three-quarters of all expected benefits from streetcar projects are associated with development activity.[20]

Yet the evidence for streetcar development effects to date is limited to a mere handful of studies which, while much more methodologically sophisticated than the purely descriptive work offered by consultants such as Hovee and Gustafson, do not employ

the more highly-developed statistical controls found in the literature on heavy and light rail's development effects.[21] Among this recent streetcar-oriented work, the studies by Nelson and his various co-authors stand out. Their earliest work examined changes in employment and residential development in a streetcar corridor versus that for both the central area of Portland and Multnomah County in which Portland is located.[22] They found increased residential development within ¼ mile of the streetcar line accompanied by the displacement of some employment within the same corridor. They pointed to the potential roles of market forces and land use policies that favored residential over nonresidential development for these results, thus emphasizing that the streetcar's presence alone was not a guarantor of such outcomes.

More recent work has examined changes in both amount and type of employment and other demographic factors around streetcars in Portland, Seattle, New Orleans, and Salt Lake City. In one study, the authors used a comparison of employment change (over a time frame extending from three years prior to streetcar construction through 2013) in a ¼-mile buffer around selected streetcar stations versus changes around bus stops that were similar to those streetcar stops.[23] They found consistent growth (above the comparison areas) around streetcar stops in Portland and New Orleans, but found less consistent results for Salt Lake City and Seattle, where residential investment occurred but employment declined slightly. In the second study, the same authors found some demographic change that indicated gentrification had occurred in the streetcar corridors, including growth in white, Asian, and higher-income populations.[24] They also found growth in both high wage employment and low wage employment which they hypothesized had emerged to serve the higher wage jobs along the streetcar line in Portland. Overall, the authors concluded that the streetcar's presence could support development but that it was not on its own a driver of such development.

Yet anticipated development impacts are heavily influencing the decision about whether to invest in this mode of transportation. Cities such as Cincinnati; Washington, D.C.; Los Angeles; and Atlanta have projected the development impact of a streetcar system to be in the billions of dollars, far exceeding anticipated costs.[25] Factors which contribute to such projections are the anticipated growth in the local tax base, added private sector investment, and additional retail activity. Such outcomes present streetcar projects favorably under the evaluation of a cost-benefit analysis. This presentation can lead to the eventual securing of public support, as they are presented as sound public investments, even when the forecast effects are highly speculative and the promise of development outcomes somewhat questionable given the absence of rigorous assessments of previous streetcar investments and their development effects.

CAUTIONS ABOUT STREETCARS AND DEVELOPMENT

Primarily supporting streetcars due to their anticipated development outcomes can be problematic. Development outcomes are not guaranteed and depend on a multitude of location-specific factors. These factors need to be considered, as they can influence the success of a streetcar system in accomplishing desired objectives.

Many cities which experience significant development along streetcar corridors employ multiple methods to achieve such outcomes.[26] The impact which these methods have in achieving desired results is frequently not publicized to the same extent that the presence of the streetcar normally is. This oversight may lead some cities to expect the achievement of similar development goals via the pursuit of their own streetcar system without having also understood the importance of these other factors. This state of affairs can be problematic, as a significant investment in a streetcar system can produce less desirable development outcomes if it is not supported with a myriad of complementary strategies. These strategies need to be determined and acknowledged in order to comprehend the factors which contribute to the significant development seen along streetcar corridors.

Relying solely on the streetcar to achieve desired development outcomes can be problematic. Cities are commonly deploying streetcars in downtown areas where planners aim to stimulate development. Transportation systems tend to already be mature in such areas, as most downtowns in major U.S. cities are already being serviced with multiple transit options such as light rail, bus, or bus rapid transit. For those reasons, a sizable transportation investment in these areas is by itself unlikely to produce much development activity due to enhanced accessibility.[27] Given this context, it should not be expected for the streetcar alone to stimulate much development activity.

The experience of Portland, Oregon, has been particularly important in stimulating renewed interests in streetcars. The Portland streetcar opened in 2001: Portland was the first U.S. city to invest in the development of a modern streetcar system. It has been expanded multiple times due to its great success. Although the streetcar experiences fewer stops, slower speeds, and less frequent service than the average bus route, it outperforms the average local bus in terms of service productivity and cost-effectiveness.[28] While the streetcar's performance is impressive, it is its perceived development impact which has brought it much attention. This system has been credited with attracting significant development along the streetcar corridor. This development is believed to have a market value of over $4.5 billion, including over 17,000 new residential units.[29] The success of the Portland streetcar has encouraged many planners to pursue this mode of transportation in hopes of experiencing similar results.[30] Cities such as Cincinnati seek to emulate the Portland example in order to address issues they are experiencing with urban decay.[31] Cincinnati's delegation visited Portland a total of 39 times while developing a system of their own—which is not out of the ordinary, as many cities point to Portland when justifying the development of their own streetcar system.

In Portland, as in many other cities experiencing growth, the streetcar is only one element of an amenity package used to attract desired development.[32] Accompanying elements commonly include zoning changes, the increase of density minimums, significant streetscape improvements, investment in public spaces, the creation of urban renewal and tax increment financing (TIF) districts, and other tax and financing incentives.[33] Officials in Portland have stated that development subsidies had a greater impact on property development along the streetcar corridor than the streetcar itself.[34] Nevertheless, the streetcar is commonly perceived, especially by outsiders, as being the primary factor which promoted observed development growth along its corridor.[35] Employing multiple strategies to pursue desired development goals is an effective approach, but it makes it hard to quantify the impact which the streetcar has made on its own.[36]

Regardless, many cities are touting significant development growth along their streetcar corridors. Portland, Seattle, Kansas City, and Atlanta have all reported over 500 million dollars in private investment along their streetcar routes.[37] Such outcomes will encourage other cities to pursue the development of their own systems, fueling the streetcar resurgence we see today.

The impact of the streetcar on development outcomes must be better understood in order to educate those who are considering investing in this mode. This study considers the many elements which help to stimulate development along streetcar corridors in order to better understand the impact of the streetcar versus other factors, including the different amenity packages which have been implemented to stimulate activity in desired development areas.

III. CASE LOCATIONS

The authors selected Portland and Seattle as the case study cities for this investigation. The rationale for the selection of Portland as one of these cities is as follows. Firstly, Portland's streetcar has served as the model for numerous other cities that hope to replicate the Portland experience with respect to development, place-making, and/or ridership outcomes.[38] Secondly, Portland's original streetcar line is also one of the older of the modern-era streetcar lines, which means that there has been sufficient time to begin to observe development effects associated with the investment. Finally, Portland's public agencies collect sufficient data to investigate the development effects of the streetcar in a rigorous, statistical manner.

The rationale for Seattle's selection is similar to that of Portland. Firstly, Seattle has operated its first streetcar line for more than ten years, which means that sufficient time has elapsed to begin to see any potential development effects. Secondly, Seattle has also been touted, although less widely than Portland, as an exemplary streetcar city that can be a model for other cities to replicate. Thirdly, Seattle's public agencies collect sufficient data to facilitate a rigorous, statistical analysis of development effects.

Table 1 provides basic descriptive statistics on each of the two streetcar systems. As the table indicates, both systems consist of two lines. Portland's system is much more extensive and consists of far more stops than Seattle's system. Both systems provide extensive hours of operation and offer relatively frequent service.

Table 1. Basic Characteristics of Streetcars in Two U.S. Cities

City	Date Opened	Length	Fare per Ride	# of Stops	Operating Hours	Service Frequency
Portland	July 20, 2001	7.2 miles (2 lines)	$2.50 per hour; passes	72	Early morning to late evening	15 min. peak and 20 min. off-peak
Seattle	December 12, 2007	3.8 miles (2 lines)	$2.25 per ride; passes	17	Early morning to late evening	10 min. peak and 12–25 min. off-peak

Sources: Portland Streetcar, "Maps and Schedules, 2017" from https://portlandstreetcar.org/schedules (Accessed October 1, 2017); Seattle Streetcar, "Maps and Schedules, 2017" from https://www.transit.dot.gov/ntd/transit-agency-profiles/king-county-department-transportation-metro-transit-division (Accessed October 1, 2017).

Figure 1 and Figure 2 depict maps of each of the systems, obtained from their operators' websites. Figure 1 indicates that Portland's system consists of a north-south line on the west side of the Willamette River running through the downtown; this line was the original streetcar line opened in 2001. The figure also shows the Loop line, which opened in stages over the past several years (initial line in 2012, second line completed in 2015) to eventually provide service connecting both sides of the Willamette River. The development pattern on the east side of the river differs considerably from that of the higher density development on the west side of the river, with much lower density development present there. Figure 2 depicts the Seattle streetcar system. The system consists of the original South Lake Union (SLU) line opened in 2007 and the First Hill line opened in 2016. The map also depicts a proposal to construct a new segment to connect the two existing lines. The two lines run through several of the city's denser neighborhoods.

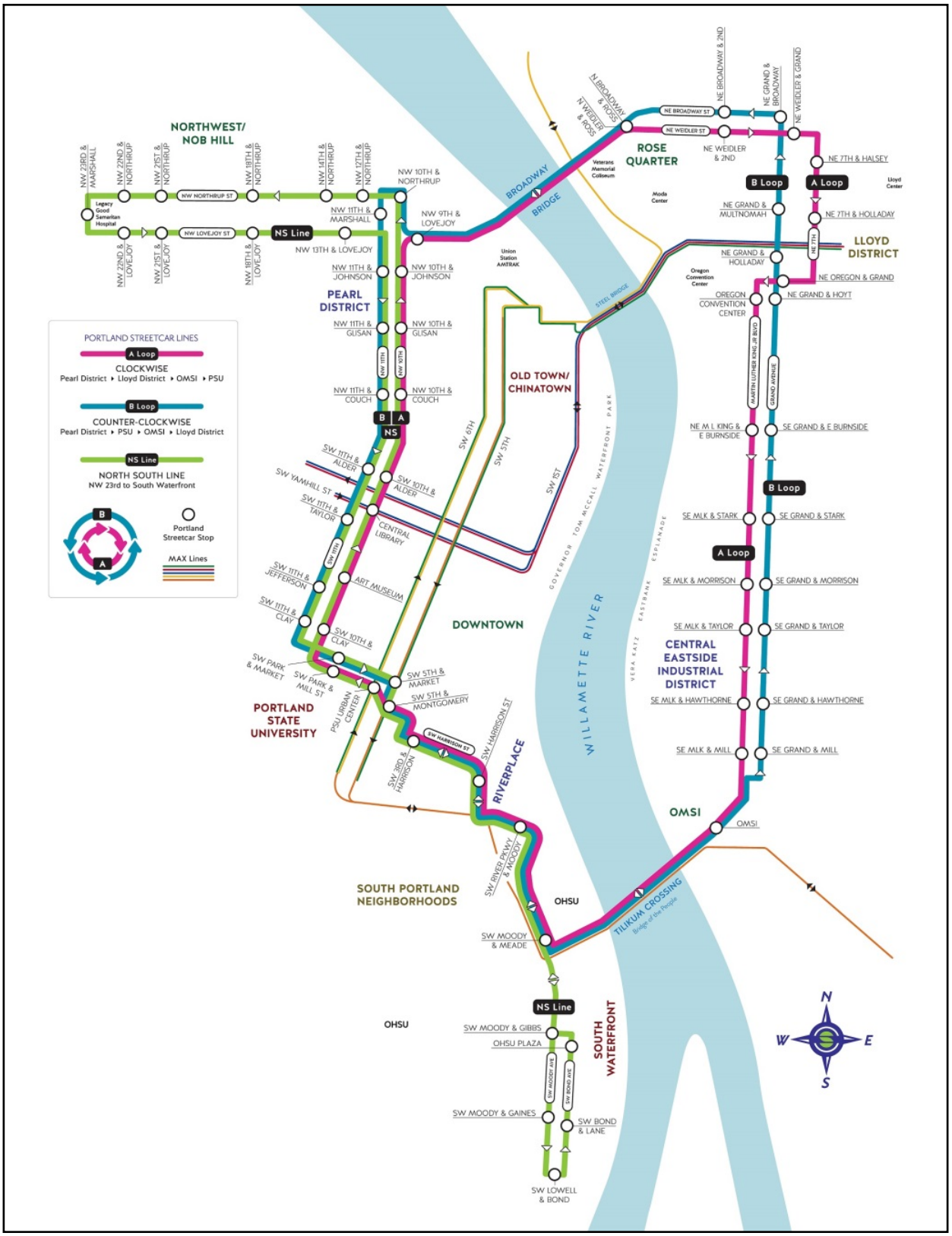

Figure 1. Map of Portland Streetcar System

Source: Portland Streetcar System Map, 2017 Downloaded from: https://portlandstreetcar.org/download/system-map (Accessed April 17, 2018).

Figure 2. Map of Seattle Streetcar System

Source: Seattle Streetcar System Map, 2017 Downloaded from https://seattlestreetcar.org /wp-content/uploads/2017/10/Connecting-the-System.pdf (Accessed April 17, 2018).

Table 2 provides ridership, service, and performance data for the two systems over a recent four-year period. The tables display the much higher ridership and service levels of the Portland system, as well as that system's more productive and cost-effective service. The table also indicates the dramatic increase in service associated with the opening of the First Hill line in 2016. To date, that newer line has not yielded ridership commensurate with the service provided, which resulted in a decline in productivity and cost-effectiveness for the Seattle system.

Table 2. Ridership and Performance of Streetcar Lines

Ridership (Unlinked Passenger Trips)				
City	2013	2014	2015	2016
Portland	3,818,224	4,441,261	4,625,317	4,313,571
Seattle	760,933	707,712	622,219	1,358,297
Service (Vehicle Revenue Hours)				
City	2013	2014	2015	2016
Portland	51,571	56,803	57,492	67,184
Seattle	11,905	12,154	12,130	39,471
Operating Expense (Unadjusted Dollars)				
City	2013	2014	2015	2016
Portland	$11,775,139	$12,310,440	$13,534,797	$16,377,407
Seattle	$3,089,936	$2,941,721	$2,825,029	$8,986,612
Service Productivity (Ridership per Unit of Service)				
City	2013	2014	2015	2016
Portland	74.04	78.19	80.45	64.21
Seattle	63.92	58.23	51.30	34.41
Cost Effectiveness (Operating Expense per Ride)				
City	2013	2014	2015	2016
Portland	$3.08	$2.77	$2.93	$3.80
Seattle	$4.06	$4.16	$4.54	$6.62

Sources: Portland Transit Profile, 2013-2016 from https://www.transit.dot.gov/ntd/transit-agency-profiles/city-portland (Accessed April 17, 2018); Seattle Transit Profile, 2013-2016 from https://www.transit.dot.gov/ntd/transit-agency-profiles/king-county-department-transportation-metro-transit-division (Accessed April 17, 2018).

IV. DEVELOPMENT OUTCOMES IN PORTLAND AND SEATTLE

With this study, the authors seek to better understand the intricate relationship between streetcar investment and development outcomes (measured by examining changes in employment, population, land values, and/or other indicators of development activity). Understanding this relationship is particularly important because it is the anticipated development impact of streetcars that is the primary factor leading many communities to pursue the implementation of such systems.[39] This study differentiates itself from previous research on streetcars and development by accounting for many of the other elements, including various development incentives, which aid in the stimulation of development activity within streetcar corridors. Many streetcar critics attribute the development activity observed within corridors to the presence of development incentives.[40] This issue can be explored by comparing development activity within streetcar corridors to that which occurred in similar areas not served by the streetcar which are subject to development incentives.

To address these issues, the authors examine development activity within the urban cores of Seattle and Portland. The urban core was deemed an appropriate study area, as reviews of local streetcar proposals have identified the desire to attract development activity to the urban core as a primary motive for the pursuit of this investment.[41] These are also the locations through which the streetcars operate. It is thus anticipated that much of the development impact of the streetcar, if any, will be concentrated within the urban core area. The authors compared development activity within the urban core, as measured by frequency of issued permits, between streetcar service areas and similar areas not served by the streetcar. The authors hypothesized that: 1) there will be no significant difference in issued permits between streetcar service areas and non-service areas receiving development incentives, and 2) there will be a higher frequency of issued permits within streetcar service areas than in non-service areas which are not receiving development incentives.

METHODS FOR QUANTIATIVE ANALYSIS

The authors define the urban core as the area within three miles of downtown in each city. The primary geographic unit for the study was the census block group. The authors classified census block groups as being within the streetcar service area if they were within ¼ of a mile of streetcar stations. A ¼-mile designation was implemented as it is considered to represent a reasonable walking distance for people when taking transit.[42] The remaining census block groups were classified as being in non-service areas (i.e. areas not served by the streetcar) and either receiving or not receiving development incentives. Those census block groups designated as being in an incentive zone were commonly located in an empowerment/enhancement/enterprise/urban renewal zone, a local improvement district (LID), or a designated growth area. The incentives programs included tax increment financing (TIF), density bonuses, a reduction of system development charges, and reductions in off-street parking requirement. The intention behind these incentives is to make areas more desirable for development activity. All census block groups located within streetcar service areas were found to be eligible for development incentives.

To better estimate the development effect of the streetcar, the authors compared development activity within the three categories of census block groups. Development activity is measured by the number of permits issued within each census block group throughout a specific time span. Only permits pertaining to new construction or significant redevelopment activity were considered. Permits were categorized based on their use, either residential or commercial, in order to explore if a certain type of development is more prevalent within streetcar corridors.

The authors employed a negative binomial regression model to compare development outcomes between the three designated groups. This model allows for count response data, i.e. as-is permit data, to be modeled while also accounting for over-dispersion of the data. Factors which are likely to influence development activity were controlled for within the model. This process included controlling for an exposure variable which is considered to influence the number of permits issued within each census block group: the variable used as the exposure variable within this model is the surface area of each census block group. By using this variable, the authors acknowledge that the number of permits issued within each census block group is likely to be influenced by the block group's size. Variables included in this model, and their anticipated influence on the response variable, are noted in Table 3. The authors direct the reader particularly to the influence of the "Urban Core Designation" variable. The resulting coefficient for this variable represents the proportion of permits which non-streetcar service areas were issued in comparison to streetcar service areas.

Table 3. Variables for Statistical Models

Variable Type	Variable	Anticipated Influence	Source
Dependent	Number of Issued Permits		
	Residential Permits		City of Portland, City of Seattle
	Commercial Permits		
Independent	Median Household Income	+	2000, 2010 U.S. Decennial Census Bureau
	Vacancy Rate	+/-	
	Distance to Downtown	-	Spatial Analysis conducted by researcher
	Distance to Light Rail	-	
	Urban Core Designation		
	Streetcar Service Area + Incentive Zone	Reference	City of Portland, City of Seattle
	Incentive Zone	≈	
	No Incentives	-	
Exposure	Surface Area		U.S. Census Bureau

A total of four models were employed for each of the two cities. One model estimates the difference in development activity within the initial streetcar corridor and other areas located within the urban core. The initial streetcar corridor refers to the areas around the original lines in each city: the North-South line in Portland and the South Lake Union line in Seattle. Another model estimates the difference in development activity within the expanded streetcar corridor and other areas within the urban core. This model incorporates

the second streetcar line, which was eventually constructed within each city, as identified in Table 4. These models were executed for residential permits and commercial permits.

Table 4. Construction and Opening Dates for Streetcar Lines

Portland Streetcar	Construction Began	Opened
North/South Line	1999	2001
Union Loop Line	2008	2012
Seattle Streetcar	**Construction Began**	**Opened**
South Lake Union Line	2006	2007
First Hill Line	2012	2016

The development effect of the initial Portland streetcar line was estimated via the analysis of permit data spanning from 1999 through 2007. This timeframe allows for the evaluation of development activity within the urban core from the start of streetcar construction. The start of construction can spur a wave of development activity within the corridor, as developers anticipate future benefits accruing to areas near the streetcar line. By evaluating permits since the start of construction, it is more likely that this activity is captured within the analysis. This study also recognizes that real estate change can take several years to come to fruition. As a result, development stimulated by the streetcar may not be observed for several years after the construction or opening of the system. Evaluating development activity numerous years after the opening of the system, as is done by this study, allows for such activity to be captured by the analysis. All subsequent models take this time lag into consideration by evaluating development activity from the start of construction of the streetcar line and including several years of post-opening observations.

The initial line of the Portland streetcar is depicted below in Figure 3. The urban core designations specific to this analysis are depicted in Figure 4.

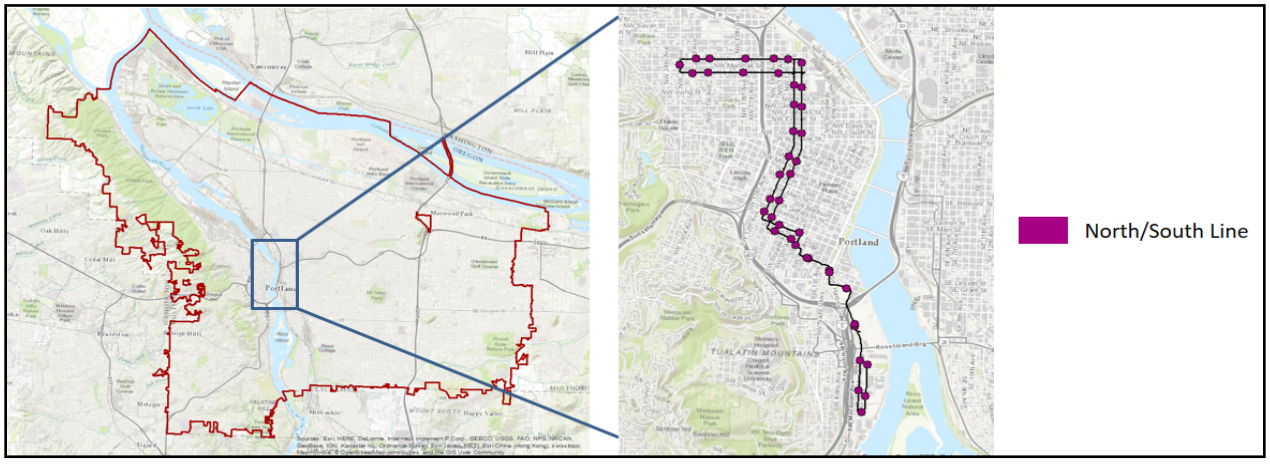

Figure 3. North-South Streetcar Line in Portland

Data Sources: U.S Census Bureau TIGER shapefiles, Oregon Metro, Esri.

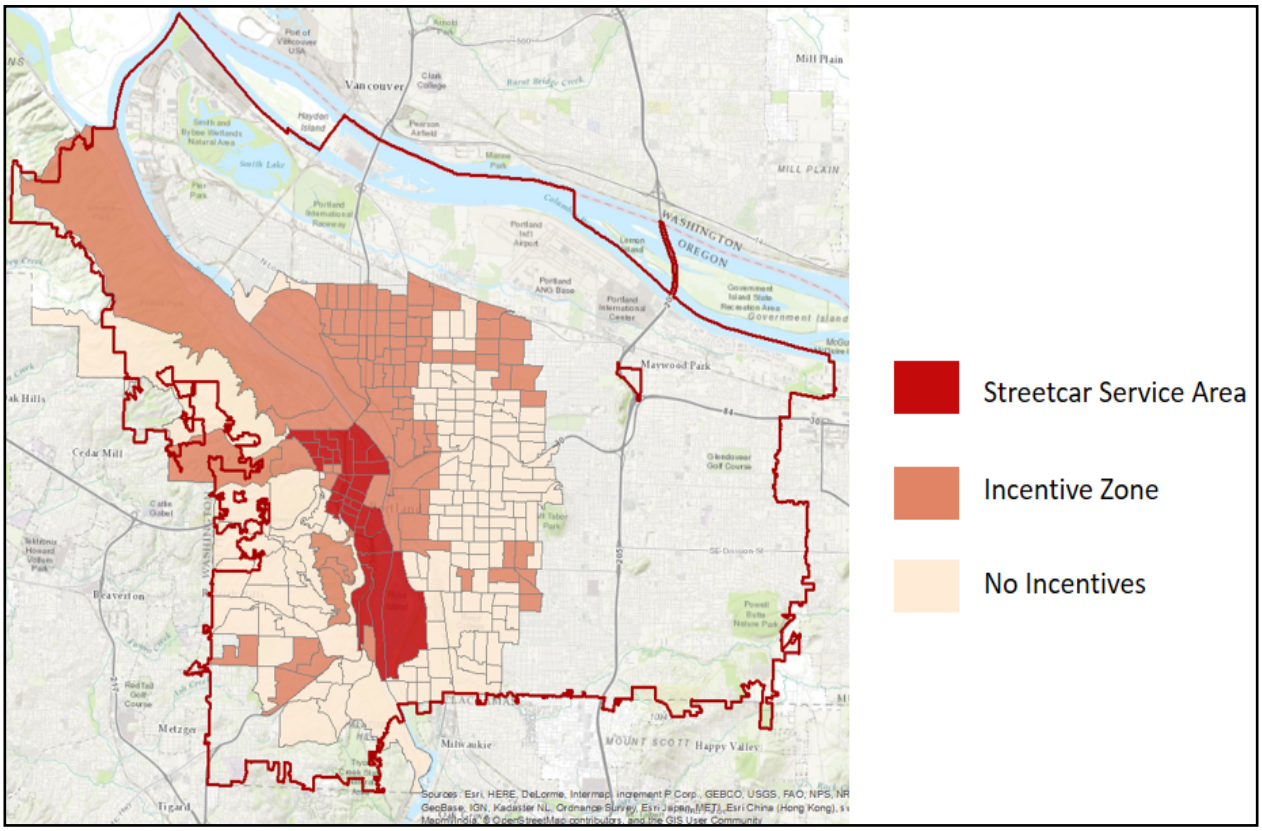

Figure 4. Portland Initial Urban Core Designations

Data Sources: U.S Census Bureau TIGER shapefiles, Esri.

The development effect of the expanded Portland streetcar system, which includes the Union Loop line, was estimated via the analysis of permits spanning 2008 through 2017. Again, this approach allows for relevant development activity which occurs before the opening of the new line and several years after opening to be captured within the analysis. The expanded Portland streetcar system is depicted in Figure 5. The urban core designations specific to this analysis are depicted in Figure 6.

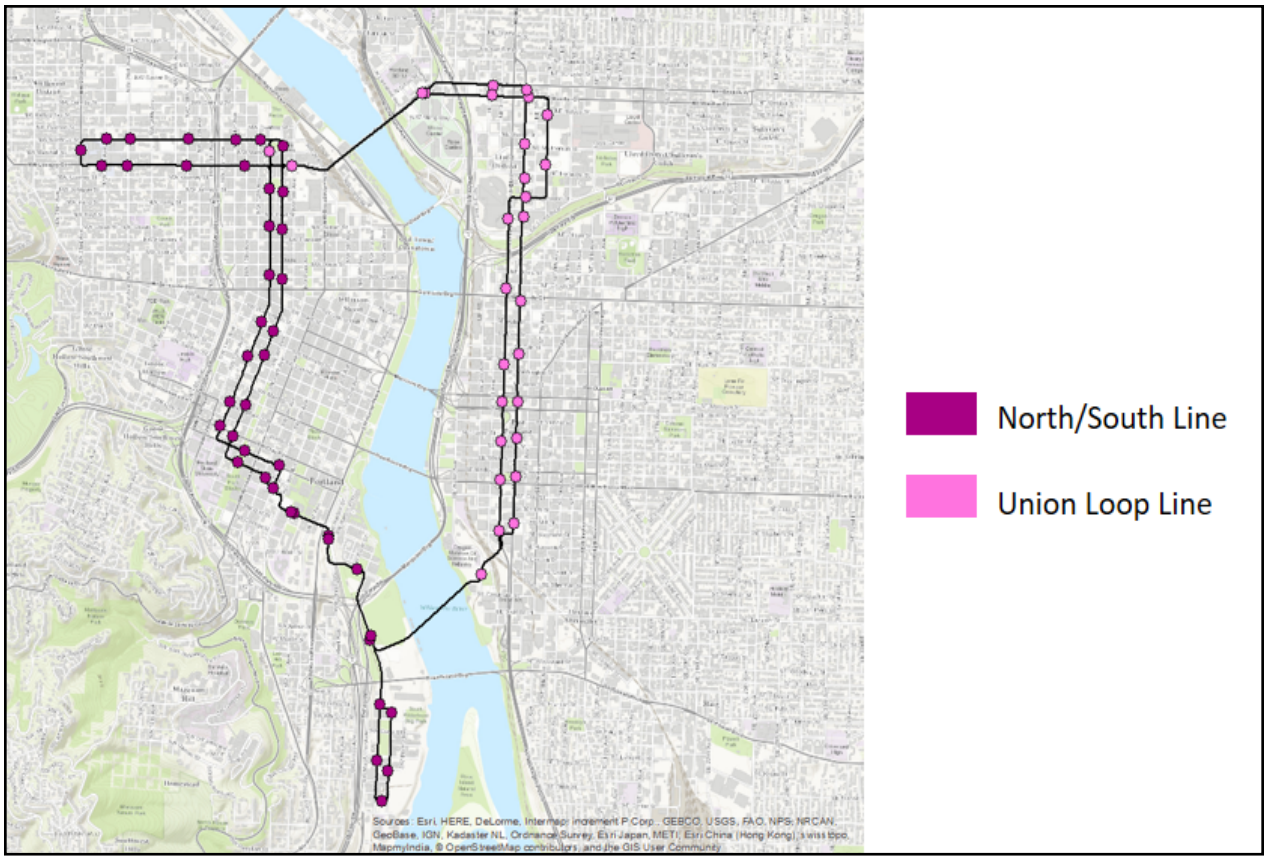

Figure 5. Expanded Portland Streetcar System

Data Sources: U.S Census Bureau TIGER shapefiles, Oregon Metro, Esri.

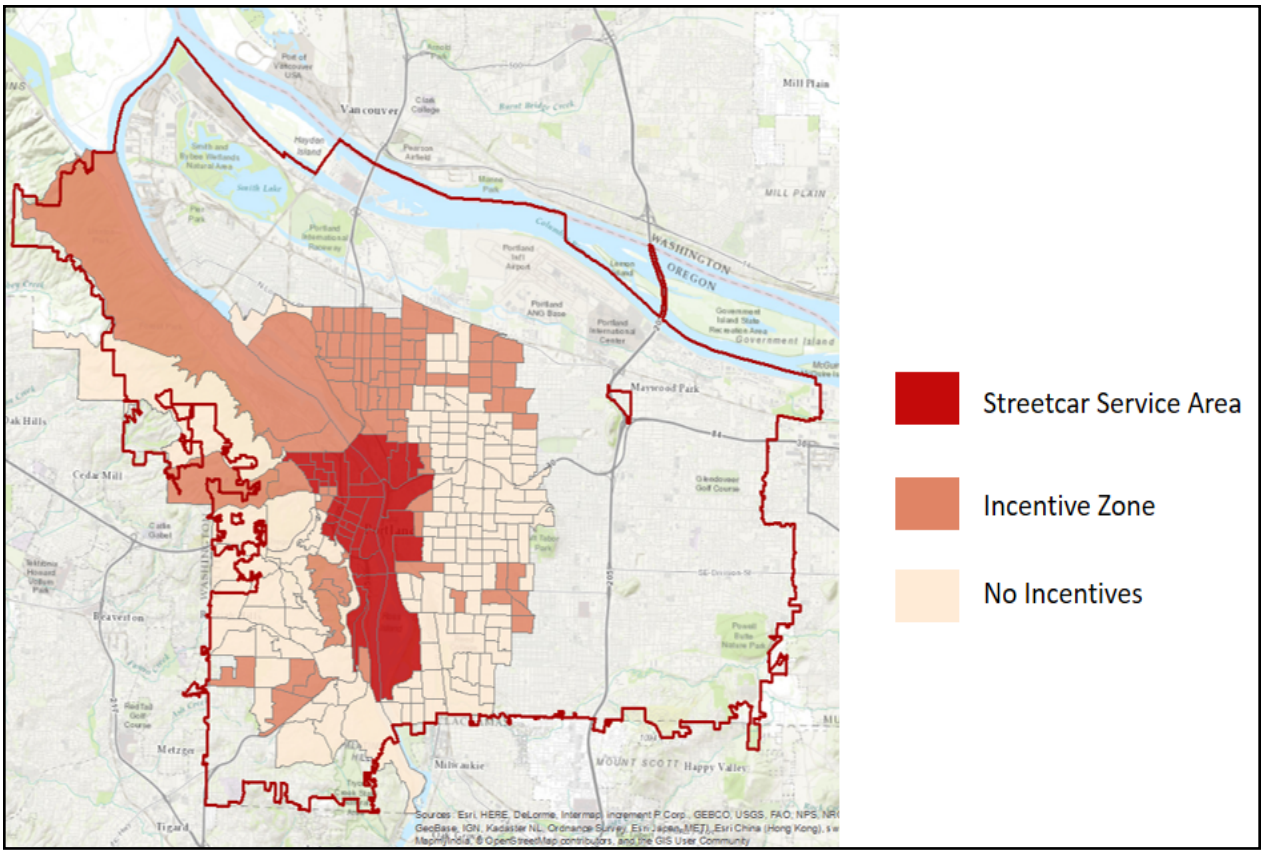

Figure 6. Portland Expanded Urban Core Designations

Data Sources: U.S Census Bureau TIGER shapefiles, Oregon Metro, Esri.

The development effect of the initial Seattle streetcar line was estimated via the analysis of permits spanning 2006 through 2011. The initial Seattle streetcar line is depicted in Figure 7. The urban core designations specific to this analysis are depicted in Figure 8.

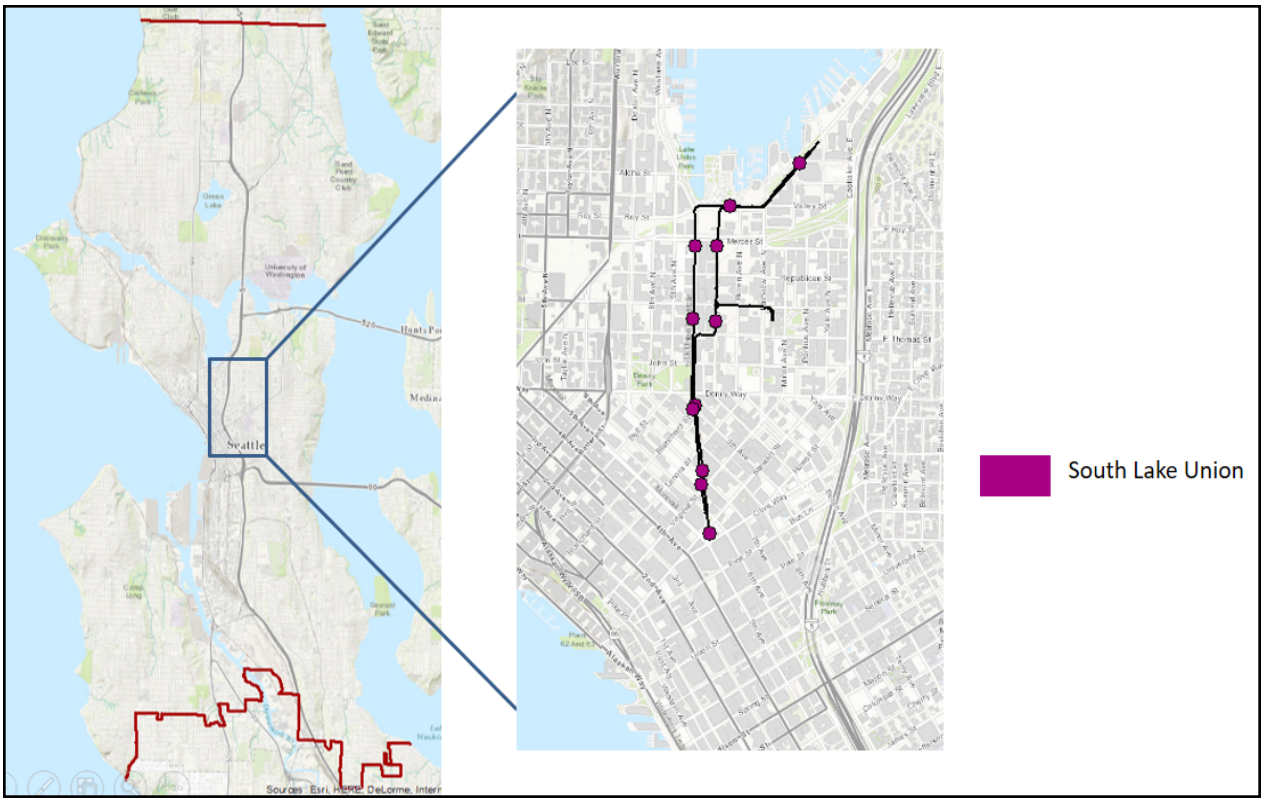

Figure 7. Seattle South Lake Union Line

Data Sources: U.S Census Bureau TIGER shapefiles, City of Seattle, Esri.

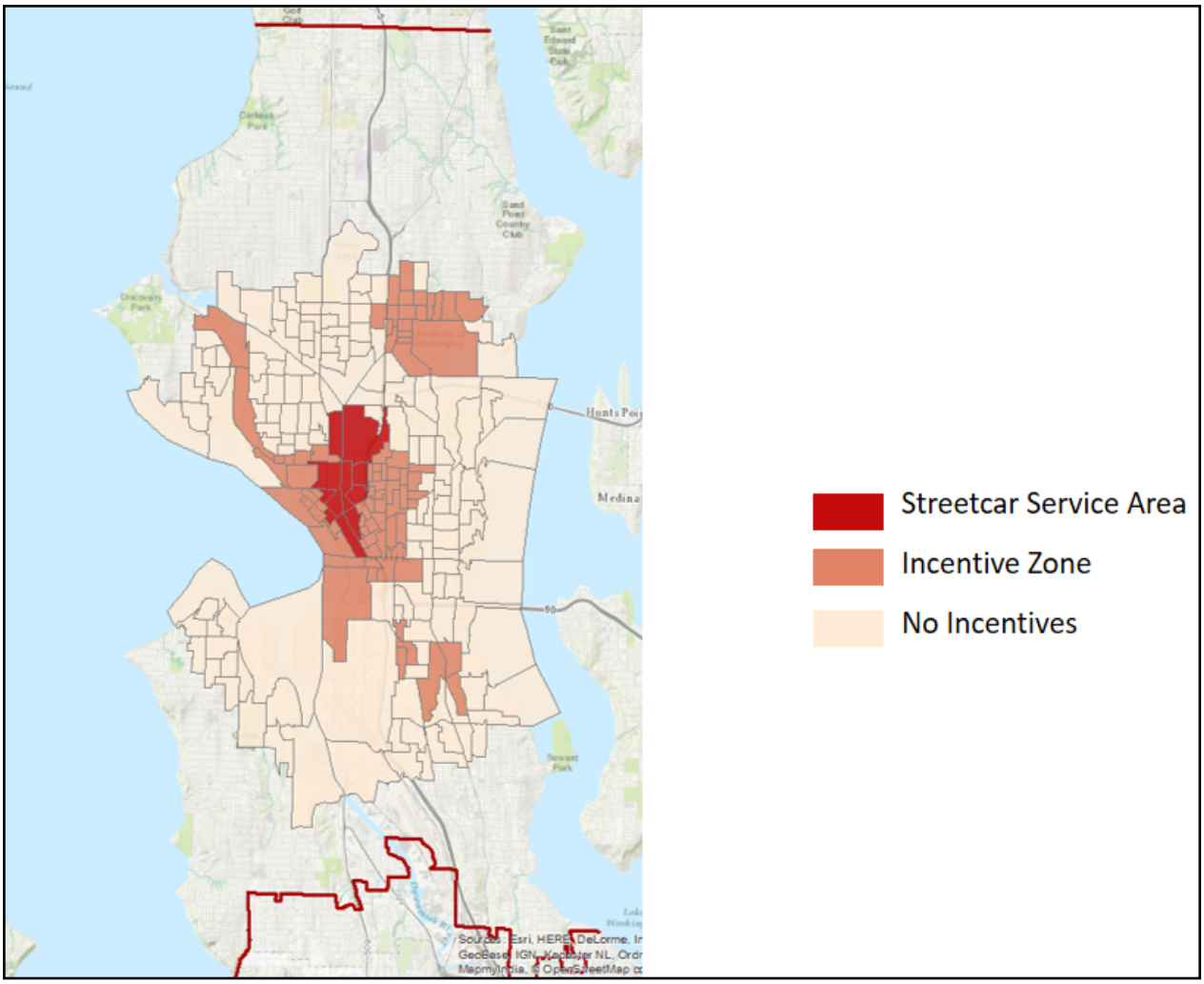

Figure 8. Seattle Initial Line Urban Core Designations

Data Sources: U.S Census Bureau TIGER shapefiles, Esri.

The development effect of the expanded Seattle streetcar system, which includes the First Hill line, was estimated via the analysis of permits spanning 2012 through 2016. The expanded streetcar Seattle streetcar system is depicted in Figure 9. The urban core designations specific to this analysis are depicted in Figure 10.

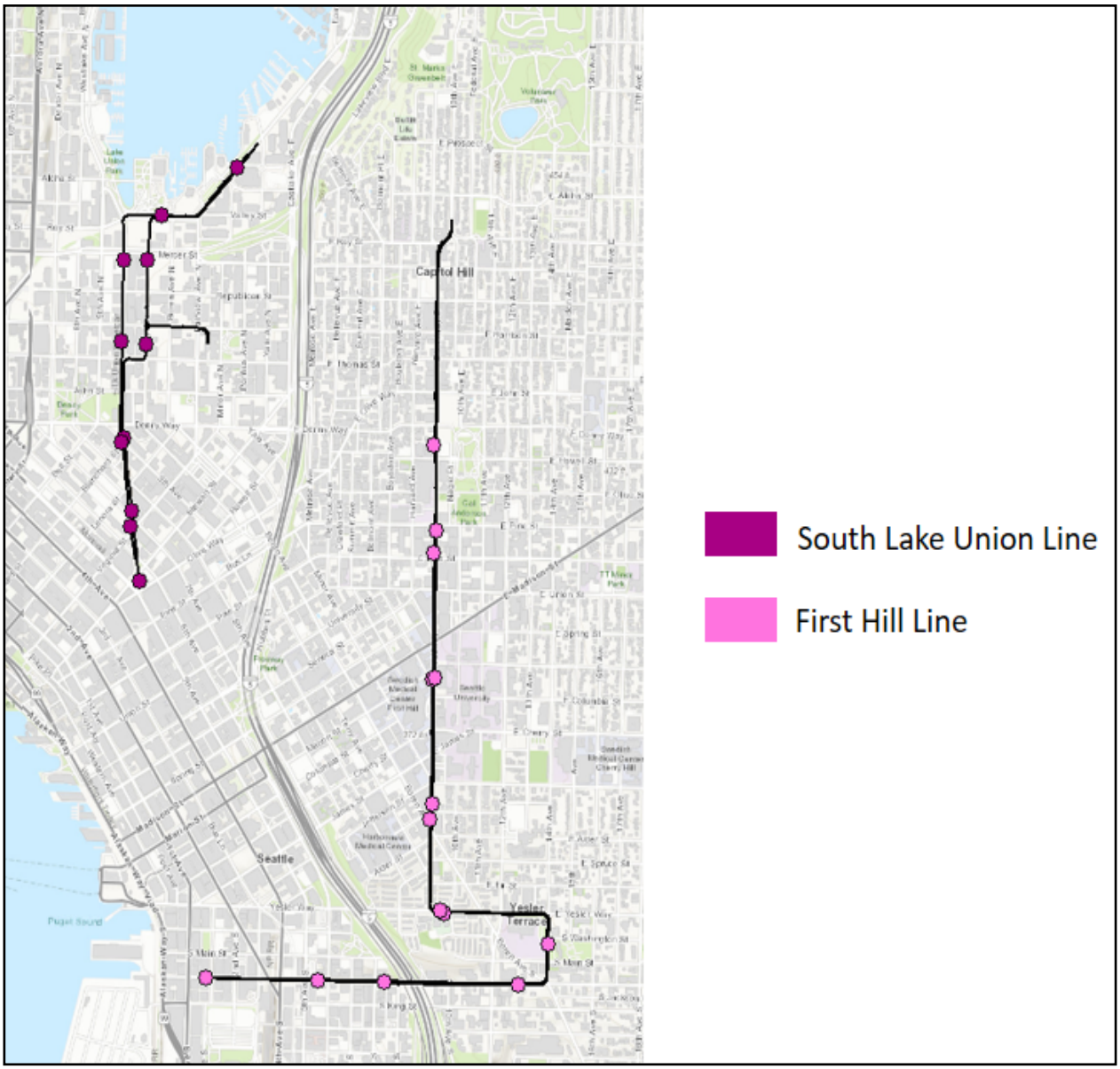

Figure 9. Expanded Seattle Streetcar System

Data Sources: U.S Census Bureau TIGER shapefiles, City of Seattle, Esri.

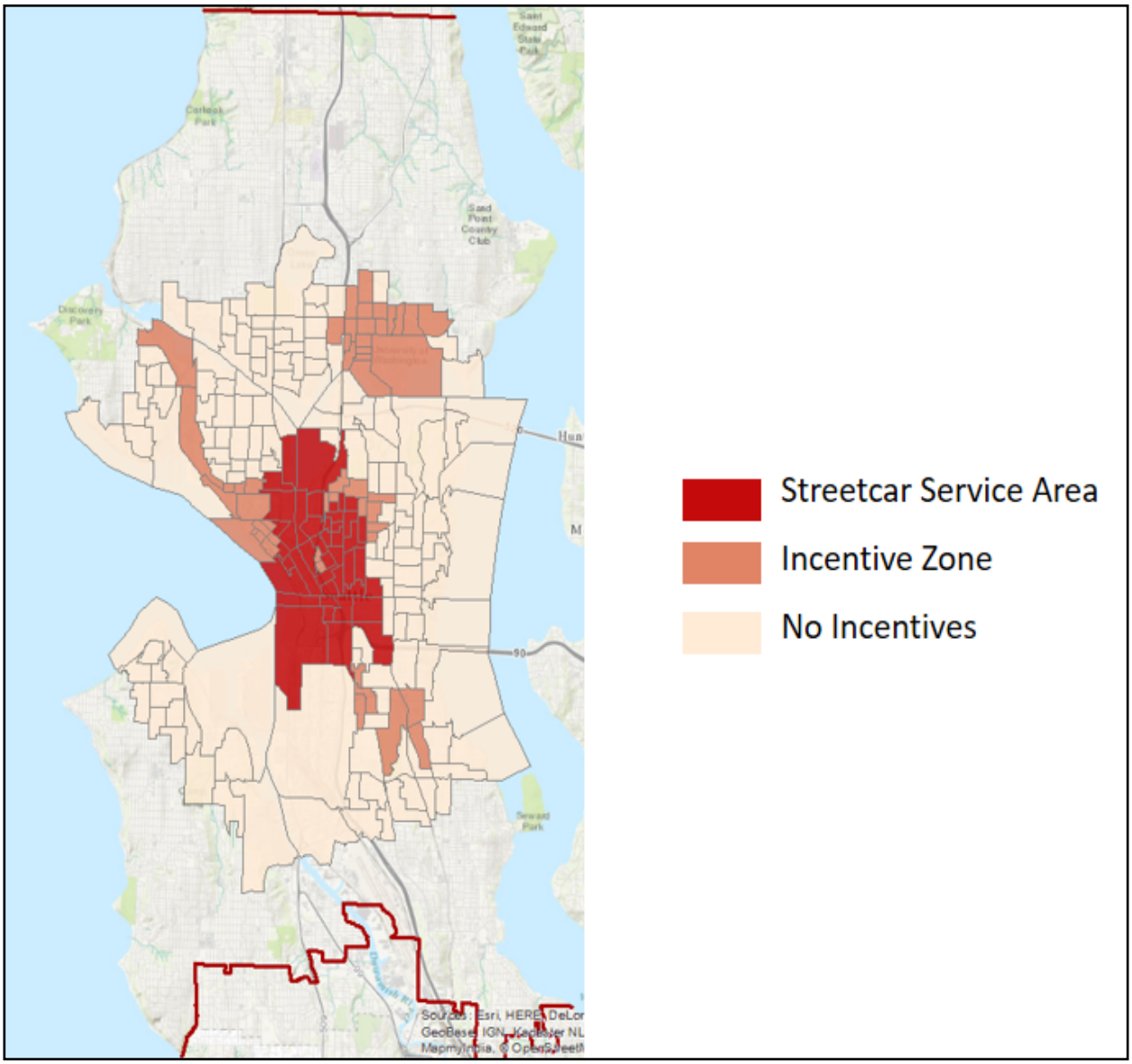

Figure 10. Seattle Expanded Urban Core Designations

Data Sources: U.S Census Bureau TIGER shapefiles, Esri.

RESULTS OF THE QUANTIATIVE ANALYSIS

Results of the negative binomial regressions are presented in the tables below. In an effort to enhance interpretation, coefficients were transformed into incident rate ratios (IRR). From the incident rate ratios, it is then possible to determine the expected percentage change in the dependent variable based on a one unit change in the independent variable. This value is determined by examining the distance the IRR is either above or below the value 1. The coefficients associated with the variable of interest, urban core designation, presents the difference in the percentage of issued permits of the specified designation to streetcar service areas.

As presented in Table 5, the results for the model which pertains to the initial Portland streetcar line show that streetcar service areas were issued roughly 45% more commercial and residential permits when compared to other areas within the urban core receiving development incentives, holding other variables constant, as represented by the IRR coefficient of the “Incentive Zone” category. A coefficient less than 1 represents a lower incidence of issued permits within the specified category when compared to the reference category, the streetcar service area. The distance of the IRR coefficient from 1 represents the difference in the percentage of issued permits. In this case, the difference is .453, which represents a 45.3% difference in the issuance of permits between these two categories.

Similar results were found when comparing streetcar service areas to other areas within the urban core which were not receiving incentives. It is estimated that streetcar service areas were issued roughly 48% more commercial permits and 30% more residential permits when compared to these areas, holding other variables constant.

Results of the model pertaining to the expanded Portland streetcar are presented in Table 6. Results here show no significant difference in the number of commercial or residential permits issued between streetcar service areas and other areas within the urban core, holding other variables constant.

Table 5. Portland Initial Line Results

	Commercial			Residential		
	IRR	**RSE**	**P>|z|**	**IRR**	**RSE**	**P>|z|**
Median HH Income (10k)	.774***	.022	.000	1.02	.015	.110
Vacancy Rate (%)	1.01	.020	.361	.991	.014	.552
Distance to Downtown (mi)	.794***	.068	.007	1.07	.133	.000
Distance to Light Rail (mi)	.837*	.090	.097	.966	.056	.553
Urban Core Designation						
Streetcar (+) Incentive	Reference			Reference		
Incentive Zone	.547***	.108	.002	.552***	.096	.001
None	.520***	.107	.002	.697**	.115	.028
Constant	.001***	.000	.000	.000***	.000	.000
N	255			255		
Log Likelihood	-1089.82			-1295.09		

Table 6. Portland Expanded Streetcar System Results

	Commercial			Residential		
	IRR	**RSE**	**P>|z|**	**IRR**	**RSE**	**P>|z|**
Median HH Income (10k)	.784***	.020	.000	1.00	.014	.810
Vacancy Rate (%)	2.09***	.320	.000	.093*	.121	.067
Distance to Downtown (mi)	.745***	.061	.000	1.05	.050	.269
Distance to Light Rail (mi)	.955	.110	.689	.943	.067	.413
Incentives						
Streetcar (+) Incentive	Reference			Reference		
Incentive Zone	.811	.162	.296	.992	.179	.964
None	.742	.140	.112	1.14	.209	.459
Constant	.001***	.000	.000	.000***	.000	.000
N	254			254		
Log Likelihood	-1081.71			-1384.67		

Results of the model which pertains to the initial Seattle streetcar line are presented in Table 7. In this case, it is estimated that streetcar service areas were issued 68% more commercial permits when compared to other areas within the urban core receiving development incentives, and 91% more commercial permits when compared to other areas not receiving incentives, holding other variables constant. The analysis of residential permits produced contrasting results. It is estimated that streetcar service areas were issued 59% fewer permits than were issued in other areas within the urban core receiving development incentives, and 143% fewer permits than were issued in other areas not receiving incentives, holding other variables constant.

These findings remained consistent when focusing on the expanded Seattle streetcar system. As shown in Table 8, it is estimated that streetcar service areas were issued roughly 53% more commercial permits than other areas within the urban core receiving development incentives and 82% more permits when compared to other areas not receiving incentives, holding other variables constant. When focusing on residential permits, it is estimated that streetcar service areas were issued 64% fewer permits when compared to other areas within the urban core receiving development incentives and 82% fewer permits than other areas not receiving incentives, holding other variables constant.

Table 7. Seattle Streetcar Initial Line Results

	Commercial			Residential		
	IRR	**RSE**	**P>|z|**	**IRR**	**RSE**	**P>|z|**
Median HH Income (10k)	.845***	.023	.000	1.02	.015	.211
Vacancy Rate (%)	1.33***	.574	.001	.234	.313	.278
Distance to Downtown (mi)	.760**	.097	.032	.840***	.050	.003
Distance to Light Rail (mi)	1.23*	.136	.058	1.14**	.061	.013
Incentives						
Streetcar (+) Incentive		Reference			Reference	
Incentive Zone	.323***	.107	.001	1.59*	.383	.055
None	.098***	.037	.000	2.43***	.584	.000
Constant						
N		228			228	
Log Likelihood		-906.31			-1035.99	

Table 8. Seattle Expanded Streetcar System Results

	Commercial			Residential		
	IRR	**RSE**	**P>|z|**	**IRR**	**RSE**	**P>|z|**
Median HH Income (10k)	.886***	.019	.000	1.02	.012	.129
Vacancy Rate (%)	1.09***	.043	.000	.036***	.036	.001
Distance to Downtown (mi)	.741***	.082	.007	.739***	.050	.000
Distance to Light Rail (mi)	1.19*	.114	.070	1.20***	.072	.003
Incentives						
Streetcar (+) Incentive		Reference			Reference	
Incentive Zone	.474***	.119	.003	1.64***	.278	.003
None	.182***	.051	.000	1.70***	.250	.000
Constant	.000***	.000	.000			
N		229			229	
Log Likelihood		-946.04			-1080.43	

DISCUSSION OF QUANTITATIVE RESULTS

The authors anticipated that differences in development activity between streetcar service areas and non-service areas receiving development incentives would be insignificant. The authors suspected that the limitations of the streetcar as a transportation option would hinder streetcar systems' ability to attract development along the streetcar corridor, because the streetcar would not significantly increase the accessibility of these properties. The authors also suspected that the development incentives present within the streetcar corridor would be primarily responsible for observed development outcomes. As a result, the authors predicted that development activity within streetcar corridors would be similar to that observed within non-service areas receiving development incentives. However, the authors also suspected that development activity within streetcar corridors would be greater than that observed in non-station areas which did not receive incentives.

Findings in Portland and Seattle only partially support the stated hypotheses. The analysis of development activity associated with the initial Portland Streetcar line showed development activity to be heightened within streetcar corridors: it is estimated that the initial streetcar corridor was issued roughly 45% more residential and commercial permits when compared to non-service areas that had also received development incentives. Thus, it appears that the presence of the streetcar had an additional beneficial effect on development outcomes. Similar results were found when comparing the issuance of commercial permits within Seattle's initial and expanded streetcar corridors to non-service areas. In these cases, it was estimated that streetcar corridors were issued over 50% more commercial permits. Again, this result would suggest that the presence of the streetcar may be producing additional development stimuli which are contributing to observed development outcomes.

Not all results support this conclusion, as we observed when focusing on the expanded Portland streetcar system. When comparing the issuance of residential and commercial permits between streetcar corridors and other areas within the urban core, no significant differences were found. This observation suggests that areas within the urban core experienced similar degrees of development activity, regardless of the presence of the streetcar or development incentives, within the specified time span. This finding places into question the development impact of the expanded streetcar system, as the corridor is not experiencing better outcomes than non-service areas. These different results could be explained either by the fact that the expanded system now serves a significant proportion of the desirable (from a development standpoint) core locations in the city, or by the lower desirability of streetcar adjacent properties along the newer streetcar line as compared to the original line. Further work would need to be done to clarify the underlying factors at play.

In Portland, the streetcar's initial line service area experienced heightened commercial and residential development when compared to other areas within the urban core. This finding is indicative of the anticipated development impact which many attribute to the presence of the streetcar. Various characteristics of the streetcar enable it to attract development along its corridors. The perceived limitations of the system as a transportation option can create an environment which is more supportive of commercial space than residential space. For one, the frequent stops and slow operating speed of the system can allow passengers to take in their surroundings and exit the system if an establishment catches their interest. Such activity is not supported by heavier rail options due to higher operating speeds and limited entry/exit points.

Further, in Portland, the streetcar is considered to be well-integrated with the overall municipal transportation network, which increases the probability of residents incorporating the streetcar into their daily travel routine, as they can use other modes of transportation to finish their trips if necessary. As supported by conversations with local developers, this state of affairs can aid in the attraction of inhabitants to residential developments located near streetcar stops. In turn, this result can stimulate residential development within streetcar corridors, contributing to the results observed in Portland.

The outcomes observed in Portland did not remain constant over time, as revealed by the analysis of development activity observed since the expansion of the Portland streetcar. The results of this analysis showed no significant difference between development activity in streetcar service areas and non-service areas. Various factors may be contributing to such outcomes. The possibility exists that streetcar service areas met their development potential by the time the Union Loop line was constructed. Multiple interviewees in Portland reported the utilization of 98% of the allowable floor-to-area ratio (FAR) (ratio of built area to land area on a parcel) within one block of the initial streetcar line, which could contribute to the lack of differentiation between development activity observed between streetcar service areas and non-service areas. Nevertheless, such outcomes provide opportunities for the development impact of the streetcar to be questioned.

Cautions are also raised by the results obtained via the analysis of the issuance of residential permits in Seattle's urban core. Both for the initial and expanded streetcar systems, it was estimated that areas not serviced by the streetcar were issued, at minimum, 59% more residential permits than areas serviced by the streetcar. This finding suggests that residential development was occurring with greater intensity in non-streetcar service areas.

In Seattle, the findings indicate that the streetcar is associated with increased commercial development. The heightened proportion of issued commercial permits within the streetcar corridor is partially explained by the nature of the area which the streetcar traverses. The South Lake Union neighborhood used to be dominated by underdeveloped industrial sites. As the authors learned through the interviews discussed in the next section of the report, the desire was for this neighborhood to be transformed into a mixed-use community and serve as a center for the biotech industry. This vision was not completely accomplished, as other kinds of commercial development took off after the implementation of the streetcar. This activity, coupled with Amazon's ever-growing footprint in the area, may be contributing to the heightened commercial development activity, and repressed residential activity, observed within the statistical results. The construction of the First Hill line did not aid in addressing this skewed development activity, as, according to local planning staff and developers interviewed for the study, the First Hill community had already reached its development potential when the streetcar was introduced. The lack of opportunities for new development along this new corridor may be contributing to the continuation of results observed when analyzing the streetcar's initial line.

V. INSIGHTS FROM STAKEHOLDER INTERVIEWS

The authors sought to provide some context for the statistical results discussed in the previous section by conducting interviews with key stakeholders in both Portland and Seattle. The authors believed that these stakeholders would provide more detail about the local context within which streetcars were implemented in each city, development strategies pursued, and results obtained. In selecting individuals for interview, the authors sought to capture the perspectives of individuals occupying a diverse set of roles in both the public and private sectors. The specific types of individuals sought included public sector land use and economic development planners, transit planners, streetcar system managers, elected officials, business leaders, developers, and representatives of community organizations in the immediate areas within which the streetcar lines operated.

The authors identified the initial set of interviewees through a review of planning documents and media coverage of the streetcar. Individuals who had a perspective on matters related to development or business activity were identified as particularly important contacts. The authors expanded the initial list of interviewees by soliciting input from early-phase interviewees about additional contacts. Ultimately, about 20 individuals were identified as candidates for interviews, of whom 12 agreed to participate. These individuals are noted with respect to their role and the city in which they live in Table 9 below.

The prospective interviewees were initially approached by email and/or telephone contact. The authors described the study and its purpose and invited them to participate in a one-hour telephone interview. The authors provided the interviewees with the questions for their interview in advance so they could be prepared for the conversation, although additional lines of inquiry often emerged in the course of the interview. The authors did not record or transcribe the interviews but instead took notes. For many interviews, both authors participated, with one asking the questions and the other taking notes. The consent form for the interviews is included as Appendix A, while the sets of questions, organized by the interviewee's general role, are included as Appendix B. The sections that follow discuss key insights gained from the interviewees from each of the two cities (first Portland and then Seattle) and then overall lessons from the interviews.

Table 9. Interviewees by Role and City

Role	Portland (1)	Seattle (2)
Streetcar Liaison (SL)	SL-1	-
Business/Developer Organization (BDO)	-	BDO-2a, BDO-2b
Developers and Property Owners (DEV)	DEV-1a, DEV-1b, DEV-1c	-
Planning Department (PD)	PD-1	PD-2
Economic Development Agency (EDA)	EDA-1	-
Local Elected Official or Leading Policymaker (POL)	-	POL-2
Community Organization (CO)	-	CO-2a, CO-2b
Total Interviews	6	6

PORTLAND INTERVIEWS: STREETCAR ORIGINS AND GOALS

Portland looms large as an influence on the streetcar cities that followed it because of the significant development activity that has occurred around the original streetcar alignment and the relatively high ridership achieved by the streetcar line. Portland's streetcar system is also the most well-studied and reported-on U.S. modern streetcar. As noted earlier, the Portland streetcar system is composed of the Loop line and the North/South (NS) lines. The initial line, the NS line, constituted the first streetcar system in the United States to incorporate modern vehicles. This line is considered to have sparked the streetcar resurgence currently being experienced within the United States.

This idea of a streetcar being implemented in Portland originated within discussions regarding transit-oriented development opportunities and regional transportation strategies (D-1a). An interviewee reported that observations of streetcars in Europe were influential when deciding whether to reintroduce this once-forgotten transportation mode back to the city streets. There was a belief that the streetcar could be the most effective in connecting the urban core to other dense areas throughout the city (D-1a). As a result, the streetcar was heavily supported by prominent political figures and key local developers (D-1a, D-1b, D-1c). This aided in the pursuit of the streetcar and its ultimate return to the City of Portland.

The goals associated with the implementation of the Portland streetcar emphasized both development and transportation. One of the primary goals of the system was for its alignment to connect high density residential neighborhoods, large tracts of industrial land use desired for redevelopment, downtown, and Portland State University (D-1a). It was anticipated that connecting dense areas would generate substantial ridership and that traversing underdeveloped land would produce opportunities for development (SC-1). Goals related to both development and transportation are articulated by most cities that have been inspired by Portland's streetcar to implement their own system, but Portland stands out as one of the very few cities that has actually taken steps to align their policies to support the pursuit of both sets of goals, as opposed to prioritizing the development side and ignoring the transportation aspects. Portland's relatively high streetcar ridership, significant non-tourism/-visitor share of streetcar trips, and close coordination between streetcar and other transit modes is a very atypical result among U.S. streetcar cities. The Portland streetcar has achieved service productivity levels which surpass those of local bus service while also being credited with attracting development to districts which it traverses (EDA-1).[43]

PORTLAND INTERVIEWS: PRIVATE SECTOR AND PUBLIC POLICY

The private sector played a large role in the development of the Portland Streetcar, as was also the case in Seattle, discussed later. A local improvement district (LID) was developed and implemented without much resistance in an effort to secure funds for the streetcar. The private sector was willing to do this because they saw the value which the streetcar would bring to their businesses and properties (D-1b; D-1c). Portland is well-known for having a robust set of policies to encourage development activity, particularly higher-density, mixed use, walkable development. While such policies are obviously quite beneficial to the streetcar, none of these policies were implemented specifically due to the streetcar's presence, instead they are policies that predate the streetcar's appearance (PD-1).

The streetcar traverses three separate urban renewal districts. These districts feature tax increment financing (TIF) and also the prosperity investment program, which provides matching grants to developers who undertake urban renewal-related efforts in these zones. The interviewees largely stated that together, these policies, coupled with the presence of the streetcar, stimulate development along the streetcar corridors within the urban renewal zones. In addition to the presence of these zones, various areas where the streetcar operates were up-zoned from industrial to knowledge-based industrial, received increases in developable floor-to-area ratios, and were subject to reductions in parking requirements (D-1b; D-1c). Developments along the streetcar corridor were also subjected to lesser transit development charges as the city realized that traffic generation would not be as great due to the presence of a variety of high-quality transit options (D-1b; D-1c). But again, no interviewee characterized these policies as being specifically geared toward supporting the streetcar. Rather, they were part of the city's larger policy of coordinating transportation and land development to achieve their community's desired outcomes in both spheres.

PORTLAND INTERVIEWS: STREETCAR AND DEVELOPMENT

After the development of the NS line, interviewees reported that developed floor area ratios were roughly at 98% usage on the line: 80% within one block of the streetcar, 70% within two blocks, and 60% within three (D-1a; D-1c). This report was a stark contrast to one interviewee's characterization of the development intensity before the streetcar which was considerably lower. Districts along the streetcar line are reported to have experienced significant development activity which amounts to over $6 billion in private investment (D-1a). The Pearl District, in particular, has experienced significant growth, as depicted by the growth of their neighborhood business association, which went from only a handful of members to over 400 (D-1a). The Lloyd district has also changed significantly since the development of the streetcar. What was commonly referred to as the "Lloyd void", due to the lack of activity observed outside of business hours, has experienced significant residential development, which has brought life to that area (D-1b; D-1c). Some developers do not believe that such outcomes could have been achieved without the streetcar. They point to the lower densities achieved by other areas in downtown Portland not traversed by the streetcar system as evidence of its influence (D-1a).

Some developers have been vocal about the influence which the streetcar has had on their location decisions. They believe that locating in areas which are in close proximity to multiple transportation options can aid in their ability to attract consumers and residents. Marketing efforts for many developments heavily focused on the transportation options available within the corridor (D-1b; D-1c). When asking new residents why they decided to lease or purchase residential space along the corridor, they report that roughly 50% mentioned the availability of various transportation alternatives (D-1b; D-1c). These same developers report that multiple residents lease a parking space only to cancel it months later after realizing that they may not need a car. Such an environment can aid in the attraction of tenants, as they can be freed of the costs and responsibilities associated with auto ownership. The ability to attract tenants and customers is not the only reason developers are attracted to streetcar corridors. Many interviewees also noted the permanence and fixed nature of the streetcar as a factor which gave them greater confidence to invest within

its corridor. Unlike bus lines, which can be altered more easily, streetcar lines are likely to remain in place (D-1a; D-1b; D-1c). A public investment of this magnitude can be a signal to developers that the city is committed to this location. Additional public investments may follow which further support the streetcar. This situation can make this area attractive for developers as they hope to experience anticipated growth in property values.

PORTLAND INTERVIEWS: STREETCAR AND TRANSPORTATION

The Portland streetcar is considered by many interviewees to be an integral part of the city's transportation network. It is one of the many options which provide transport capacity to several areas experiencing substantial growth (PD-1). The system is considered to be well-integrated within the greater transportation network and to complement bus, bike, and light rail systems (SL-1). While some interviewees initially considered the streetcar to be a novelty for tourists, they now report data that suggest that the majority of users are commuters traveling to school or work (D-1a; D-1b; D-1c). Some interviewees attribute this finding to the system being so well-connected to the regional transportation network that people feel comfortable incorporating the streetcar into their everyday travel (D-1a). The ability of the system to serve the needs of the local populace, coupled with the development outcomes observed within its corridors, contributes to the perceived success of the Portland streetcar system.

SEATTLE INTERVIEWS: STREETCAR ORIGINS AND GOALS

Most interviewees pointed out that the Seattle streetcar has a long history preceding its implementation—first in South Lake Union, which most of this discussion concerns, and then in First Hill. South Lake Union (SLU), the site of the initial line, once served as the desired location for a proposed urban park. This amenity would provide Seattle with something which many thought it drastically needed: large open space near downtown. Since the park was the brainchild of Microsoft co-founder Paul Allen, who owned significant property in the area, the private sector was very supportive of this initiative and contributed to its development by donating land and capital. Private entities believed that the presence of the urban park in SLU would help attract activity to the area and enhance opportunities for development. Even with the presence of private support, public concern remained, as the majority of project costs were to be covered via property taxes. This concern lingered and ultimately contributed to the defeat of this proposal at the ballot box two times over. Attention was eventually directed towards the use of another amenity which could improve the development potential of SLU: the streetcar (DBO-2b; PD-2; POL-2).

The vision for SLU was for it to become a center for the biotech industry, particularly given the presence of the Fred Hutchinson Cancer Research Center in the area. The interviewees noted that development of a biotech cluster was the hope of many major property owners and city officials (CO-2a; POL-2). Discussion on how to transform SLU from the underdeveloped industrial area which it was then spawned talk about the possibility of using a streetcar to spur this activity. A streetcar connecting SLU to downtown was seen as potentially aiding in the attraction of activity and development into the area (POL-1; PD-2). Many critics emerged due to the inherent limitations of the streetcar as a transportation alternative. But with Portland as an example of a streetcar success story,

interviewees noted that streetcar proponents were aware of these limitations and focused their efforts on publicizing the potential development impacts of the system in order to change the minds of enough skeptics to implement the system (POL-2; PD-2).

The interviewees reported that goals associated with the implementation of the SLU streetcar had a definite development emphasis (PD-2). The primary objective was for the streetcar to help transform SLU into the biotech hub many wanted it to become. This aim was very different from the goals associated with what would be the First Hill streetcar line. The interviewees noted that the First Hill line was constructed in part because of the reluctance to construct a light rail station within that area due to topographical barriers (POL-2; PD-2). There was a perceived need for enhanced transit alternatives in that area which could serve activity generators such as the local hospital. The extension of light rail into First Hill was deemed to be too expensive, and so the city pursued the more economical streetcar alternative to serve this community (POL-2). While the SLU streetcar line was pursued primarily for development reasons, the First Hill line was a different story. This line was primarily pursued for its perceived ability to address the mobility needs of residents and employees of the First Hill neighborhood.

SEATTLE INTERVIEWS: PRIVATE SECTOR AND PUBLIC POLICY

The effort to bring the SLU streetcar project to fruition brought many parties together from both the public and the private arena. Looming particularly large in the story was Paul Allen's Vulcan, Inc., which had major landholdings in the area. Vulcan provided leadership and/or financial assistance to many of the private sector entities whose activities helped lead to the streetcar. Subsequently to the streetcar's appearance, Amazon has become a dominant private sector force in the South Lake Union area due to its large employment footprint there. The rise of Amazon and ancillary activities, in fact, supplanted the earlier focus on biotech that had spurred the original streetcar effort.

Interviewees noted that one of the major proponents of the streetcar project was the SLU Chamber of Commerce (BDO-2B; POL-2). Support from local businesses was significant due to the small population residing within SLU. Residents of SLU eventually organized and formed a neighborhood coalition, with help from the chamber of commerce, and they also voiced their support for the streetcar project (POL-2). Additional support for the streetcar came from the Mercer Coalition, which consisted of over 30 stakeholders such as Amazon, Vulcan Real Estate, and the Gates Foundation (DBO-2a; DBO-2b). The Mercer Coalition was actively involved in matters regarding multimodal transportation ever since their involvement in the Mercer Corridor street improvement project, which transformed a high-speed, auto-oriented highway into an urban road more suitable for a dense city environment. This coalition was able to bring together many diverse interests and work towards building consensus on issues relating to major infrastructure projects. To support the streetcar, this coalition generated critical letters of support for both the initial and second phase Transportation Investment Generating Economic Recovery (TIGER) grants that funded streetcar construction. Financial support for the development of the streetcar was further generated by a streetcar local development district (LID) (COA-2). To develop a LID, local businesses and property owners within roughly five blocks of the streetcar agreed to establish a special property tax levy which varied based on proximity to the streetcar. This district ultimately generated $25 million towards the cost of the project.

The interviewees noted that various strategies were pursued by both public and private entities in order to aid in the attainment of the goals set forth for the streetcar. Within the SLU area, zoning was modified in order to provide biotech firms a greater height allowance (PD-2). Since the vision for SLU was for it to become a center for Biotech, many development incentives were geared towards attracting such firms. Incentives were eventually expanded as Amazon and Vulcan became more active in SLU (PD-2). Much of SLU was up-zoned in order to aid in the transition of industrial space into high density mixed use development (PD-2; CO-2a). Additional development stimulants came in the form of incentivized zoning which provided developers with height allowances if they included either affordable housing or daycare within their projects (PD-2). Place-making investments were also made with private entities contributing greatly in this capacity (CO-2a). Continued financial support for the area was also secured via the designation of SLU as a tax increment financing (TIF) zone (PD-2).

SEATTLE INTERVIEWS: STREETCAR AND DEVELOPMENT

The perception is that the SLU streetcar has had a significant impact on the development observed along its corridor. This perception is fueled by developers who claim that the streetcar was influential in their decision to invest within the corridor (POL-2). Major infrastructure investments, such as the streetcar, can give developers confidence to develop in a specific location due to the anticipated impact such investments will have on property values. Transportation projects, specifically, can greatly impact adjacent businesses by making them accessible to the greater region (DBO-2a). This impact is augmented in areas such as SLU due to its proximity to downtown. Some interviewees stated that they consider SLU a gateway to downtown, with the streetcar better exposing it to passing traffic, which could fuel more businesses in the area. Such activity can be funneled through the streetcar corridor, making adjacent land more desirable for development.

Nevertheless, the development impact of the streetcar is questioned by some observers due to its limited capabilities as a transportation option. According to two interviewees, the limited extent of the streetcar line, lack of connectivity to the regional transit network, and the slow operating speed make the streetcar an ineffective people mover (CB-2; DBO-2b). Many others believe that the numerous development inducers present within the corridor are what primarily drove development. The presence of underdeveloped land, the availability of large parcels, up-zoning, and other development incentives are a few of the elements which many consider to be largely responsible for observed development outcomes (DBO-2b; POL-2; PD-2).

SEATTLE INTERVIEWS: STREETCAR AND TRANSPORTATION

While the streetcar has received much praise for its purported development impact, many interviewees have identified numerous negative effects associated with its implementation. One such impact is associated with its poor performance as a transportation alternative. Many interviewees attribute this problem to cities' not having dedicated lanes on which the streetcar can operate. This omission creates opportunities for vehicle conflicts, which in turn slows the streetcar, impacts its reliability, and also contributes to road congestion (POL-2; CO-2b). The limited capabilities of the streetcar as a transportation option

raise some questions about why other transportation options were not pursued. Some interviewees point to empty streetcars and full buses as justification for improvements to bus rapid transit lines or the development of a regional bus system (POL-2; CO-2a). A focus on the streetcar is considered to be depleting resources from alternatives which could have greater mobility benefits. While the streetcar is recognized as having a positive impact on the marketing of the city, through the role it plays as a visible icon of the city, it is considered by some to consume transportation resources without producing many transportation benefits (POL-2). The implementation of the streetcar has also produced other financial issues, such as placing stress on the overall transit operating budget, which the city has had to address. It was anticipated that such issues would be avoided due to the creation of the local improvement district which was anticipated to generate sufficient revenue to cover a large proportion of the streetcar cost, but these expectations were not met, and the city has been forced to carry a significant amount of debt which is being partially paid via the general fund (POL-2).

The role which the streetcar plays within the greater transportation network is limited. Some consider the system as a business district people mover above anything else (POL-2). However, while many residents are supportive of the streetcar, the system can only serve them when making very short trips (CO-2b; DBO-2a). In these instances, some prefer to walk due to the limited operating speed of the streetcar (DBO-2b). While the current role of the streetcar is limited, many have great aspirations for the future of this mode of transit. Developing a connection between the SLU and the First Hill line, creating a horseshoe alignment as a result, is considered by some to have the potential to drastically improve ridership, create opportunities for greater connectivity to the regional transit system, and better serve tourism (CO-2b; DBO-2a; DBO-2b). In this capacity, the streetcar can become the transportation option many hoped it would be.

SIMILARITIES AND DIFFERENCES BETWEEN THE TWO CITIES

The interviewees highlighted important similarities and key differences between the two cities that might contribute to their positive development and transportation outcomes. With respect to similarities, both communities emphasized the importance of both types of goals—they aspired to have streetcars that move people and that help to support and spur development activity. Both cities have strong policy supports in place to aid their desired development goals, although most policies were not implemented solely due to the streetcar. Both cities also enjoy very favorable development market conditions, with Seattle particularly benefitting from the rapid growth of Amazon and its ancillary businesses in the South Lake Union area. All of these factors are seen as contributing to a positive development result, in the views of the interviewees, surrounding the streetcars in the two cities.

Both cities also operate their streetcars in areas that have relatively high-quality transit services, with buses and light rail available in proximity to the streetcar lines. The interviewees believe that Portland does a better job of coordinating its streetcar services with other modes, while in Seattle, the currently limited extent of the still-separate South Lake Union and First Hill lines limit the appeal of the service to patrons or the need to better coordinate services for their benefit. Just as the completion of the Loop line in Portland led to significant ridership gains for the streetcar line there, Seattle observers have similar hopes for the linkage of the two streetcar lines in Seattle.

VI. LESSONS FROM THE STUDY

This study seeks to inform effective planning and policy decisions in cities contemplating streetcar investment. The outcomes of this study produce lessons which can guide such cities in their pursuit of streetcar investment.

As observed within this study, the presence of the streetcar does not guarantee the attainment of heightened development outcomes. While the analysis of development activity associated with the initial Portland streetcar line showed development activity to be heightened within streetcar corridors, in other instances, the implementation of alternate development stimulants may produce comparable outcomes in the absence of a streetcar project, such as was found to be the case when analyzing the issuance of permits within the service area of the expanded Portland streetcar system. Here, the authors found no significant difference in the issuance of permits between areas within the urban core that were served by the streetcar versus those not served by the streetcar. In Seattle, the authors found that areas served by the streetcar were issued significantly fewer residential permits than areas not served by the streetcar, although there was much greater commercial permit activity in the areas served by the streetcar in the South Lake Union area. Many of these outcomes were likely due to the expansion of Amazon and ancillary businesses in the area.

Collectively, these findings call into question the consistency of development effects associated with the presence of the streetcar. The attainment of anticipated development impacts is not always guaranteed. If the achievement of development goals is driving the pursuit of the streetcar, which the interviews strongly suggest is the case, the implementation of alternate policies should also be considered. The utilization of such incentives can produce heightened development outcomes which could equal or exceed the outcomes produced as a result of the streetcar investment. Such initiatives would aid in the pursuit of development goals and have a lower capital cost associated with their implementation.

Even in instances where heightened development activity is experienced within streetcar corridors, resulting outcomes may not be what was anticipated or desired by policymakers. The South Lake Union neighborhood in Seattle serves as an example. Policymakers pursued the streetcar in order to aid in the transformation of this industrial, underdeveloped area into a dense mixed land use neighborhood. The desire was for South Lake Union to be equal parts residential and commercial. Since the implementation of the streetcar, this neighborhood has undergone significant redevelopment, as was the hope of policymakers. However, the majority of development occurring in South Lake Union has been commercial in nature. As opposed to providing equivalent residential and commercial opportunities, this neighborhood is dominated by many of Seattle's major employers. This has been a major economic benefit for the area but it was not the original intention of streetcar promoters. While the presence of a streetcar can aid in the stimulation of development activity, other policies may need to be in place in order to ensure that resulting development is contributing to the achievement of desired outcomes.

Lastly, the importance of treating the streetcar as a transportation alternative, not just as a development stimulant, is a major lesson highlighted within this study. Portland serves as an example of how this understanding can contribute to the ability of the streetcar to meet both transportation and development goals. In Portland, the streetcar is considered by many to play an active role in addressing their travel needs. Unlike with other American streetcar systems, the majority of passengers of the Portland streetcar are residents commuting to school or work. This may be surprising to some observers due to the inherent limitations of the streetcar as a transportation option. However, Portland demonstrates that the integration of the streetcar with the greater transportation network is something which may help address these limitations. Passengers are able to use light rail and bus service in conjunction with the streetcar when making longer trips that would not have been supported with the use of the streetcar alone. This activity can contribute to the attainment of higher ridership levels. Heightened usage of the system can also aid in the attainment of development goals, as served properties begin to enjoy more of an accessibility premium that is reflected in land rents. According to the interviews, inhabitants of residential properties along the Portland streetcar commonly cited the presence of transportation alternatives, such as the streetcar, as a primary factor influencing their location decisions. Attracting residents to development along the streetcar is easier when the transit system can meet their transportation needs.

These findings in Portland stand in contrast to Seattle, where the streetcar system consists of two disconnected lines that do not seem to be attracting very many regular users because of their inherent limitations with respect to speed, reliability, and geographic reach. Some Seattle observers hope that the construction of the delayed connection between the lines might make the entire system more attractive to users, but construction is as yet uncertain.

In any case, the lesson from Portland's experience seems to be that the more effective a streetcar is as a transportation service, and the more widely used it is by patrons, the more likely it is to have development effects. Simultaneously, we note that a streetcar alone is not a guarantee of positive outcomes, as other factors such as a healthy real estate market, available land, and development supportive zoning and other policies also need to be present. More cities that are operating streetcars or contemplating making a streetcar investment would be best served by keeping these issues in mind when making their own decisions. The streetcar should thus always be treated as a legitimate transportation alternative as its performance can have significant development implications.

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APPENDIX A: CONSENT FORM

Agreement to Participate in Research
Responsible Investigator: Jeffrey Brown

Title: Streetcars in the United States: An Exploration of Planning and Policy Decisions to Support Streetcar Goals

1. You have been asked to participate in a research project examining the goals of the streetcar opened in your city, as well as the land use and transportation policies adopted by your community to support the streetcar. This project will take place from September 2017 through the end of August 2018.

2. You will be asked a series of questions about streetcar goals and your assessment of goal attainment, land use policies adopted to support the streetcar and your assessment of these policies, and transportation policies adopted to support the streetcar and your assessment of these policies. The author will ask the questions during a one-hour, one-time interview. With your permission, he will record the interview for note-taking purposes.

3. No foreseeable risks are expected to arise from your participation in the study.

4. The author will provide you with a copy of the final report. The research will provide insights for residents, planners, and policymakers in communities considering the construction of a streetcar system and officials at the state and federal agencies that fund these projects. The information may also be presented in scholarly publications.

5. Although the results of this study may be published, no direct quotations will be included without your express, written permission. Your name will not appear in any published material. You will instead be identified in terms of your role as a transportation planner or a land use planner, the city in which you work, and your general views and perceptions. If the author wishes to directly quote your interview responses in any publication, he will contact you to obtain your permission to do so. If you consent to be quoted directly, only your quoted interview responses and not your name will be printed in the publication(s) in question.

6. There is no compensation for participation in the study.

7. Questions about this research may be addressed to the investigator listed above. Complaints about the research may be presented to ***Professor Tim Chapin, Dean, College of Social Sciences and Public Policy, email: tchapin@fsu.edu, (850) 644-6284.*** If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the FSU IRB at 2010 Levy Street, Research Building B, Suite 276, Tallahassee, FL 32306-2742, or 850-644-7900, or by email at humansubjects@fsu.edu.

8. No service of any kind, to which you are otherwise entitled, will be lost or jeopardized if you choose to "not participate" in the study.

9. Your consent is being given voluntarily. You may refuse to participate in the entire study or in any part of the study. During the interviews, you have the right to not answer questions you do not wish to answer. If you decide to participate in the study, you are free to withdraw at any time without any negative effect on your relations with the Florida State University or with any other participating institutions or agencies.

10. At the time that you sign this consent form, you will receive a copy of it for your records, signed and dated by the investigator. The signature of a subject on this document indicates agreement to participate in the study. The signature of a researcher on this document indicates agreement to include the above named subject in the research and attestation that the subject has been fully informed of his or her rights.

11. Your responses will remain confidential. This confidentiality is protected to the extent allowed by law.

_____ _____

Signature **Date**

_____ _____

Investigator's Signature **Date**

FSU Human Subjects Committee approved on 08/22/17. Void after 08/21/18. HSC # 2017 21831

APPENDIX B: INTERVIEW QUESTIONS

Business Leader

1. Tell me about your background.

2. Tell me about your firm/organization.

3. How would you characterize the business environment, and particularly in the central areas through which the streetcar now operates, prior to the streetcar's appearance? How would you characterize the same area today?

4. What is your overall assessment of the streetcar and its impact on the central area of your community? What have been the most important impacts of the streetcar? Would these results have happened without the streetcar's presence? If not, why not?

5. When/how did your organization become involved in discussions around the streetcar? What were/are its positions/goals? What issues were of greatest concern during the discussion and planning phases? Have these issues been addressed?

6. How has the streetcar impacted your firm and/or the decisions that it makes? Have there been any particularly noteworthy consequences of the streetcar for the company's activities (development projects and/or their locations/sizes/designs, etc.)?

7. Would your firm's decisions have changed in any ways if the streetcar was absent? If so, how and why?

8. Has the city, or have related entities, implemented any programs/policies related to business promotion or development in tandem with the streetcar? If so, which ones and how would you assess the effectiveness of these policies?

9. If these policies were absent, would your firm have made the same decisions that it has done? If now, how would your firm's decisions have changed?

10. Which is more important as a support for your firm's business activities: the streetcar? Other business promotion or development policies or programs? And if the latter, which ones are most important?

11. How would you characterize your relationship with the local business promotion entity? Have they been responsive to your organization's concerns? Does your organization feel that its voice is being heard?

12. How would you characterize your relationship with the streetcar operating entity? Have they been responsive to your organization's concerns? Does your organization feel that its voice is being heard?

13. Has anything surprised you about the streetcar (either in a good way or not)?

14. Are there any decisions that, in retrospect, might have been better made differently? If so, which ones and how?

15. Who are other key figures in the business community or development community you think I should speak to as part of the study?

16. Are there any particular issues you think I should be sensitive to as I continue the study?

17. If someone from another city that was contemplating a streetcar came to you for advice, what would you tell them?

Developer

1. Tell me about your background.

2. Tell me about your firm/organization.

3. How would you characterize the development market in your city, and particularly in the central areas through which the streetcar now operates, prior to the streetcar's appearance? How would you characterize the same area today?

4. What is your overall assessment of the streetcar and its impact on the central area of your community? What have been the most important impacts of the streetcar? Would these results have happened without the streetcar's presence? If not, why not?

5. When/how did your organization become involved in discussions around the streetcar? What were/are its positions/goals? What issues were of greatest concern during the discussion and planning phases? Have these issues been addressed?

6. How has the streetcar impacted your firm and/or the decisions that it makes? Have there been any particularly noteworthy consequences of the streetcar for the company's activities (development projects and/or their locations/sizes/designs, etc.)?

7. Would your firm's decisions have changed in any ways if the streetcar was absent? If so, how and why?

8. Has the city, or related entities, implemented any programs/policies related to business activity or development in tandem with the streetcar? If so, which ones and how would you assess the effectiveness of these policies?

9. If these policies were absent, would your firm have made the same development and investment decisions that it has done? If now, how would your firm's decisions have changed?

10. Which is more important as a support for your firm's development activities: the streetcar? Other development policies or programs? And if the latter, which ones are most important?

11. How would you characterize your relationship with the local economic development entity? Have they been responsive to your organization's concerns? Does your organization feel that its voice is being heard?

12. How would you characterize your relationship with the streetcar operating entity? Have they been responsive to your organization's concerns? Does your organization feel that its voice is being heard?

13. Has anything surprised you about the streetcar (either in a good way or not)?

14. Are there any decisions that, in retrospect, might have been better made differently? If so, which ones and how?

15. Who are other key figures in the business community or development community you think I should speak to as part of the study?

16. Are there any particular issues you think I should be sensitive to as I continue the study?

17. If someone from another city that was contemplating a streetcar came to you for advice, what would you tell them?

Private Sector Business Promotion Organization

1. What is your position in your current organization? How long have you been in the position? What are your current duties?

2. What is the mission of your organization? What kinds of activities does your organization engage in to achieve its mission?

3. How engaged is your organization with the public sector around issues of business support, business promotion, or development more generally? With which entities do you engage? Around what issues?

4. How would you assess the business environment in your community? Has it changed in any significant ways in recent years?

5. How familiar are you with the streetcar in your community? Has your organization or its members been engaged in any discussions around the streetcar or related issues?

6. What is your organization's view of the streetcar's goals and its performance in attaining its goals?

7. How important is the presence of the streetcar in supporting the business activity of your organization's members whose operations are located in the streetcar service area? If it were absent, how might its absence have changed the local business environment?

8. In many communities, we've had interviewees tell us that the streetcar was important to them as a symbolic public commitment to an area that made them feel more confident about making their own private investments in the same area. Do you feel similarly or different about the streetcar in your community? How and why?

9. What kinds of business promotion/support or development policies or programs does your community provide? How would you assess their effectiveness? If these programs were absent, how might their absence have changed the local business environment or affected your organization's members?

10. What is the relative importance of these policies or programs compared to that of the streetcar?

11. Has your organization conducted any studies of the results of the streetcar or public policies or programs on business or other activity? Have you surveyed your members about their feelings about any of these issues?

12. Are there any members of your organization who you would point to as having been particularly active in either discussions around the streetcar or discussions about business promotion/support or development policies that we should speak with?

13. Are there any other issues you think we should be aware of as we conduct our study?

14. If someone at a similar organization as yours in another city came to you for advice about the issues we have discussed, what would you tell them?

Private Sector Development Promotion Organization

1. What is your position in your current organization? How long have you been in the position? What are your current duties?

2. What is the mission of your organization? What kinds of activities does your organization engage in to achieve its mission?

3. How engaged is your organization with the public sector around issues of development? With which entities do you engage? Around what issues?

4. How would you assess the development environment in your community? Has it changed in any significant ways in recent years?

5. How familiar are you with the streetcar in your community? Has your organization or its members been engaged in any discussions around the streetcar or related issues?

6. What is your organization's view of the streetcar's goals and its performance in attaining its goals?

7. How important is the presence of the streetcar in supporting the activity of your organization's members whose operations are located in the streetcar service area? If it were absent, how might its absence have changed the local environment?

8. In many communities, we've had interviewees tell us that the streetcar was important to them as a symbolic public commitment to an area that made them feel more confident about making their own private investments in the same area. Do you feel similar or different about the streetcar in your community? How and why?

9. What kinds of development policies or programs does your community provide? How would you assess their effectiveness? If these programs were absent, how might their absence have changed the local environment or affected your organization's members?

10. What is the relative importance of these policies or programs compared to that of the streetcar?

11. Has your organization conducted any studies of the results of the streetcar or public policies or programs on development or other economic activity? Have you surveyed your members about their feelings about any of these issues?

12. Are there any members of your organization who you would point to as having been particularly active in either discussions around the streetcar or discussions about development that we should speak with?

13. Are there any other issues you think we should be aware of as we conduct our study?

14. If someone at a similar organization as yours in another city came to you for advice about the issues we have discussed, what would you tell them?

Public Sector Actors

1. When did you join your current organization?

2. What is your position? What are your primary responsibilities?

3. What are your organization's goals?

4. How do you assess the streetcar's impact on the attainment of your organization's goals and/or the work that you do? Are there any formal assessments of the streetcar's impacts?

5. Has the presence of the streetcar changed the goals, policies, or programs of your organization in any way? If so, how?

6. What kinds of programs or policies does your organization provide/manage to attract/ support development activity? Are any of these programs or policies specific to the areas served by the streetcar? If so, which ones and why?

7. Were any of these policies or programs implemented specifically because of the streetcar? If so, which ones and why?

8. Have any assessments been completed as to the effectiveness of these programs or policies? If so, what were the results?

9. What is your sense as to the relative importance of these programs or policies for decisions made by developers or businesspeople to invest in the area served by the streetcar? Have you done any surveys of their attitudes?

10. Do you formally track private sector development or business activity? In the area served by the streetcar? How would you characterize the level of this activity at present? Has it changed in recent years?

11. Who are the key developers or business people who are actively investing in the areas served by the streetcar?

12. Do any particular developers, business people, or related entities stand out as having stated the importance of any of the streetcar and/or these policies or programs to their decisions?

13. Are there any particularly active private sector organizations that support/encourage/ represent developers and/or business people in the area served by the streetcar (or the broader community) with which your organization engages?

14. How does your organization determine the types of programs or policies to use to encourage/support development? Who is involved in making decisions about the design and implementation of these policies?

15. Who are your organization's key private sector or community partners on development issues? To what degree does the general public get involved in discussions around development issues?

16. Our study is focused on identifying what developers value the most when deciding to build within streetcar corridors, how the amenity packages used to attract development are constructed, and how important the streetcar versus other factors are in their decision making. Given this focus, are there other issues you think we should discuss right now? Given this focus, are there other people you think we should speak with in the course of our study?

ABBREVIATIONS AND ACRONYMS

BDO	Business/Developer Organization (Interview)
CO	Community Organization (Interview)
DC	District of Columbia (Washington)
DEV	Developers and Property Owners (Interview)
EDA	Economic Development Agency (Interview)
ESRI	Environmental Systems Research Institute
FAR	Floor to Area Ratio
IRR	Incident Rate Ratio
LID	Local Improvement District
NS	North-South (Line)
PD	Planning Department (Interview)
POL	Local Elected Official or Leading Policymaker (Interview)
SL	Streetcar Liaison (Interview)
SLU	South Lake Union
TIF	Tax Increment Financing
TIGER	Transportation Investment Generating Economic Recovery (grant)
TIGER	Topologically Integrated Geographic Encoding and Referencing (data)
US	United States

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JEFFREY BROWN, PhD

Jeffrey Brown is a Professor and Chairperson in the Department of Urban and Regional Planning at Florida State University. His research explores the role of public transportation in contemporary cities; transportation finance; the interplay between the finance, planning, and use of transportation systems; the relationship between transportation and the built environment; and the history of planning. His most recent work includes an examination of streetcar systems in U.S. cities and an assessment of strategies for transit to better serve aging populations, particularly those residing in rural areas and small communities.

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PEER REVIEW

San José State University, of the California State University system, and the MTI Board of Trustees have agreed upon a peer review process required for all research published by MTI. The purpose of the review process is to ensure that the results presented are based upon a professionally acceptable research protocol.

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