

WHY STREETCARS?

The Role of Streetcars in Portland



Acknowledgements

Why Streetcars? The Role of Streetcars in Portland

City of Portland

Sam Adams, Commissioner of Public Utilities

Shoshanah Oppenheim, Senior Policy Analyst, Office of Commissioner Sam Adams

Patrick Sweeney, AICP, LEED AP, Streetcar System Plan Project Manager, Bureau of Transportation

Grant Morehead, Transportation Planner, Bureau of Transportation

Primary Authors

Mark Dorn, PE, URS Project Manager

Sharon Kelly, URS

(All photos URS unless otherwise noted)

This primer includes material from several sources. The City of Portland would like to specifically recognize the following:

- ◆ *Street Smart: Streetcars and Cities in the Twenty-First Century*. Edited by Gloria Ohland and Shelley Poticha, Reconnecting America
- ◆ "Portland Streetcar System Plan: Working Paper - Network Design" by URS San Francisco. Authors: Mark Dorn (URS, Portland), John Cullerton (URS Portland), Sharon Kelly (URS, Portland), Duncan Watry (URS San Francisco), Irene Avetyan (URS San Francisco)
- ◆ "Portland Streetcar System Plan: Working Paper - Transit Technology Review" by URS San Francisco. Authors: Mark Dorn (URS Portland), Sharon Kelly (URS Portland), Duncan Watry (URS San Francisco), Julia Chan (URS San Francisco)
- ◆ "Portland Streetcar Development Oriented Transit" by the Bureau of Transportation and Portland Streetcar, Inc., March 2008
- ◆ "Streetcar-Development Linkage: The Portland Streetcar Loop" by E.D. Hovee & Company, LLC, February 2008
- ◆ "Central City Streetcar: Commitment, Permanence, Catalyst" by Zimmer Gunsul Frasca Partnership, August 1993

The Buzz on Streetcar

Cities rediscover allure of streetcars

Updated 1/10/2007 8:38 PM ET

By Haya El Nasser, USA TODAY

The streetcars that rumbled and clanged through many American cities from the late 1800s until World War II helped shape neighborhoods. More than a half-century later, streetcars are coming back and reviving the same neighborhoods they helped create.

Several cities have resurrected the streetcar tradition and about three dozen others plan to — from Tucson, and Birmingham, Ala., to Miami and Trenton, N.J.

This return to the past is less about satisfying a sense of nostalgia than about enticing developers and people to old industrial areas and faded neighborhoods. As cities experience a much-publicized urban renaissance, streetcars have become another draw for investment in housing, stores and restaurants.

Cities hope that streetcars can do in this century what they did in the last: Connect neighborhoods and provide a relatively cheap alternative to walking and driving.

"The return of the streetcars is not really happening for new reasons but for the same reasons," says Michael English, vice president of Tampa Historic Streetcar, which operates along 2.5 miles connecting downtown, the fashionable loft and entertainment Channelside district and historic Ybor City. The city had a 54-mile system until 1946. The new line opened in

2002 and condominiums have been sprouting up along the way since.

"We spent \$55 million," English says. "It attracted well over \$1 billion in private investment. ... Part of the marketing attraction is that we were bringing back something that is viewed here very romantically. A lot of people who grew up here used it all the time."

In the face of worsening traffic congestion, public support for mass transit is rising. Many cities, however, cannot afford to build light-rail lines that often must extend several miles to have a chance of attracting federal dollars.

Funding of light-rail systems often requires evidence that they will save passengers time. To make that case, most rail lines have to stretch out to the suburbs to reach commuters, an expensive undertaking.

Trains with 'sex appeal'

Electric streetcars are light-rail, too, but they're less expensive because they use lighter cars, fewer cars and shorter tracks that share the road with cars and buses. And they evoke many emotions, from a sweet longing for the good old days to the passion of Marlon Brando's primal cry — "Stellaaaaaaa" — in *A Streetcar Named Desire*.

"Streetcars have sex appeal," says Len Brandrup, director of transportation in Kenosha, Wis., which opened a 1.9-mile line in 2000. "It resonates with folks. . . developers don't write checks for buses."



Table of Contents

1	<i>Why a Streetcar Network?</i>	6
2	<i>Why Streetcars?</i>	11
3	<i>What is a Streetcar Corridor?</i>	16
4	<i>What is the Streetcar System Planning Process?</i>	22

Streetcar lines cost about \$10 million to \$15 million a mile compared with \$50 million to \$75 million a mile for light-rail lines.

Most streetcar lines stretch for less than 5 miles compared with 10 to 20 miles for light rail. They’ve become so appealing that some developers are helping pay for the systems, says Shelley Poticha, president and CEO of Reconnecting America, a national non-profit group that works to spur development around transit stops.

Some streetcars are vintage and refurbished. Others, such as Tampa’s, are new trolleys designed to replicate the look of old. Yet others are new and look modern.

“It’s an inexpensive way of providing transit,” Poticha says. “It expands the reach of pedestrians in a community without having to build an expensive infrastructure. It can be built quickly, inexpensively, right into the street to get around without a car more easily.”

Streetcars aren’t a total solution to transit needs because they can’t carry vast numbers of commuters, according to Street Smart, a new book published by Reconnecting America and other mass-transit advocates. But they can augment other forms of transit.

How streetcars are reviving neighborhoods

Portland, Ore., often at the forefront of urban innovation, was the first to build a modern streetcar system in its downtown Pearl District. It attracted about 100 projects worth \$2.3 billion in less than five years, all within two blocks of the line. They include 7,248 housing units and 4.6 million square feet of office and retail. Proximity to mass transit allowed developers to build fewer parking spaces. Ridership was more than triple projections.

Kenosha, a small industrial city on the shore of Lake Michigan, had streetcars from 1903 to 1932. The streetcars died and American Motors and Chrysler plants closed. The city remained a rail hub between two growing metropolitan areas, Chicago and Milwaukee, and the plant closings gave it about 70 acres of prime downtown lakefront real estate to work with.

Little Rock opened its 2.5-mile River Rail streetcar in 2004. It connects key destinations — the arena, convention center and River Market District — and lofts, hotels, government buildings and museums. It has been so successful that work has begun on a mile-long extension to the William J. Clinton Presidential Library.

About \$200 million in development has either been planned or built along the \$19.6-million line, Street Smart estimates. Now, North Little Rock plans a \$28 million minor-league baseball stadium.



Introduction

Portland developed around its historic streetcar network, which began with a horse-drawn line on 1st Avenue in 1872. The early streetcar lines served both as a mode of transportation and as an organizing tool for new development. They were constructed with the intent of drawing people to live in new, outlying neighborhoods. Before any new development began, developers would first extend a streetcar line into the area. Street railway companies would then add these new streetcar lines to their systems.



Between about 1890 and 1925, streetcar lines opened up at least 14 of Portland's historic neighborhoods for development. Over time, streetcar commercial districts evolved as the activity centers and main streets that still exist in Portland's close-in neighborhoods. For example, the Woodlawn neighborhood in North Portland was platted for streetcar accessibility, with grid-shifted streets radiating away from the streetcar station. These early transit investments allowed people to commute greater distances, from new residential developments to the industrial and employment areas in central Portland.



The idea of reintroducing modern streetcar service in Portland first emerged as part of the 1988 Central City Plan. From its inception, the Central City streetcar drew on the same land use-transportation nexus that led to the historic system: among the key goals for streetcar was "encouraging infill...and serving as a catalyst for housing development." The initial 2.4 mile streetcar alignment was selected to connect major ridership generators and employment centers: Legacy Good Samaritan Hospital and Portland State University. The line was strategically routed through the heart of the burgeoning Pearl District. Constructed at a cost of \$55 million, service began in 2001. In 2007, the line was extended through the South Waterfront district.

As a development stimulus, streetcar has been a resounding success: by 2008, private developers had invested \$3.5 billion within two blocks of the alignment, including over 10,000 new housing units and 5.4 million square feet of office, institutional, retail and hotel construction. This represents approximately two-thirds of all development in central Portland during that time. Notably, these developments are utilizing more of the allowed floor area ratio (FAR)* than developments not near streetcar: developments adjacent to the streetcar have utilized over 90% of its potential FAR, compared to just over 40% for developments not near streetcar.

Building the Portland Streetcar was one of the important transportation decisions made by the City of Portland in recent years. It has enhanced business growth, livability and housing options. Streetcar corridors are expected to play a key role in helping the City of Portland absorb some of the one million new residents Metro expects in the region by 2035. The planning effort which is underway by the Bureau of Transportation (BOT) is known as the Portland Streetcar System Plan.

The Portland Streetcar System Plan (SSP) is intended to identify potential corridors that will build upon the success of the existing streetcar system and expand service to best serve Portland's neighborhoods and business districts. It is a key element in the City's plan for more sustainable future growth. The SSP will evaluate and compare corridors most promising for modern streetcar, based on development potential, operational feasibility, transit connectivity, and public involvement. BOT is working closely with TriMet, Bureau of Planning, Metro, Portland Development Commission and ODOT to make sure the SSP effort is well coordinated local and regional policies. BOT and Bureau of Planning are coordinating closely to make the SSP an integral element of the City's update to the comprehensive land use plan, better known as the Portland Plan.

* Floor area ratio is the amount of floor area in relation to the amount of site area, expressed in square feet. For example, a floor area ratio of 2 to 1 means two square feet of floor area for every one square foot of site area.

What is the role of a streetcar system in Portland?

- ◆ It's about accommodating growth along transit corridors while respecting the unique character of each Portland neighborhood;
- ◆ It's about providing an accessible network of transportation options that will reduce our dependency on the automobile;
- ◆ It's about promoting better health by fostering more pedestrian activity and coordinating with existing and planned bicycle connections;
- ◆ It's about promoting better air quality and conservation of our natural resources by reducing greenhouse gas emissions and controlling urban sprawl;
- ◆ It's about finding new ways to utilize our transportation corridors as the region continues to grow;
- ◆ It's about advancing a healthy and competitive local, regional and state economy;
- ◆ It's one small part of how our transportation choices will be changing in the decades to come.

About this document

This document is intended to provide the reader with the context and background that is helping to help shape the Portland Streetcar System Plan. Summarizing the technical research and experience to date with streetcar service in Portland and elsewhere, it is divided into the following four chapters.

Chapter 1, ***Why a Streetcar Network***, outlines the growth that the City expects and a vision that sees streetcars as a valuable means to help shape that growth. This chapter also details the goals for the Portland Streetcar System Plan process and how this process relates to other planning efforts.

Chapter 2, ***Why Streetcars***, outlines the characteristics that help make streetcars uniquely positioned to meet these objectives. It then explains how streetcars fit into a range of transit services and into an overall transit system.

Chapter 3, ***What is a Streetcar Corridor***, defines the term "streetcar corridor," examines how streetcar corridors can both accommodate growth and protect existing neighborhoods, and introduces the concept of coordinating transportation investments with other infrastructure improvements in green corridors.

Chapter 4, ***What is the Streetcar System Planning Process***, outlines the timeline, process and measures by which the City and its residents are evaluating corridors for streetcar expansion. After reviewing planning work that preceded the study and showing corridors currently under consideration for streetcar service, the chapter discusses issues that an implementation strategy will need to address.

A Historic Perspective

How Have Historic Streetcars Influenced Today's Urban Form and Land Use Patterns?

Early urbanization and development patterns in Portland are deeply tied to early streetcar development. For about 70 years, between about 1889 and 1958, streetcars operated on Portland streets and demonstrated substantial influence on the city's early development patterns. During these years, development within Portland and the surrounding area was heavily influenced by the location of streetcar lines. The early streetcars were primarily built by private land developers to attract homebuyers to then outlying suburban areas.

Streetcars were generally phased out between 1924 and 1958 in favor of private automobiles and buses for public transit. The map at right illustrates the Portland Streetcar System circa 1922.

Between 1946 and 1956, there was a substantial increase in the number of motor vehicles in the Portland region. During this time street and road improvements were primarily financed by state and local governments. In 1956, the Federal Aid Highway Act began construction of the interstate system.

This marks the point at which the public policy decision was made to greatly increase public investment in roadway facilities. Metropolitan system studies for "urban expressways" became institutionalized in Federal law with the Federal Aid Highway Act of 1962, which also required coordination with other affected forms of transportation and was the first policy recognition of a role for public transit. Notably missing after about 1950, however, was investment in public transit.



NE Martin Luther King Jr. Boulevard at NE Russell
(Photo: Oregon Historical Society)



Reconstruction of NE Martin Luther King Jr. Boulevard at NE Russell in 1966
(Photo: Oregon Historical Society)

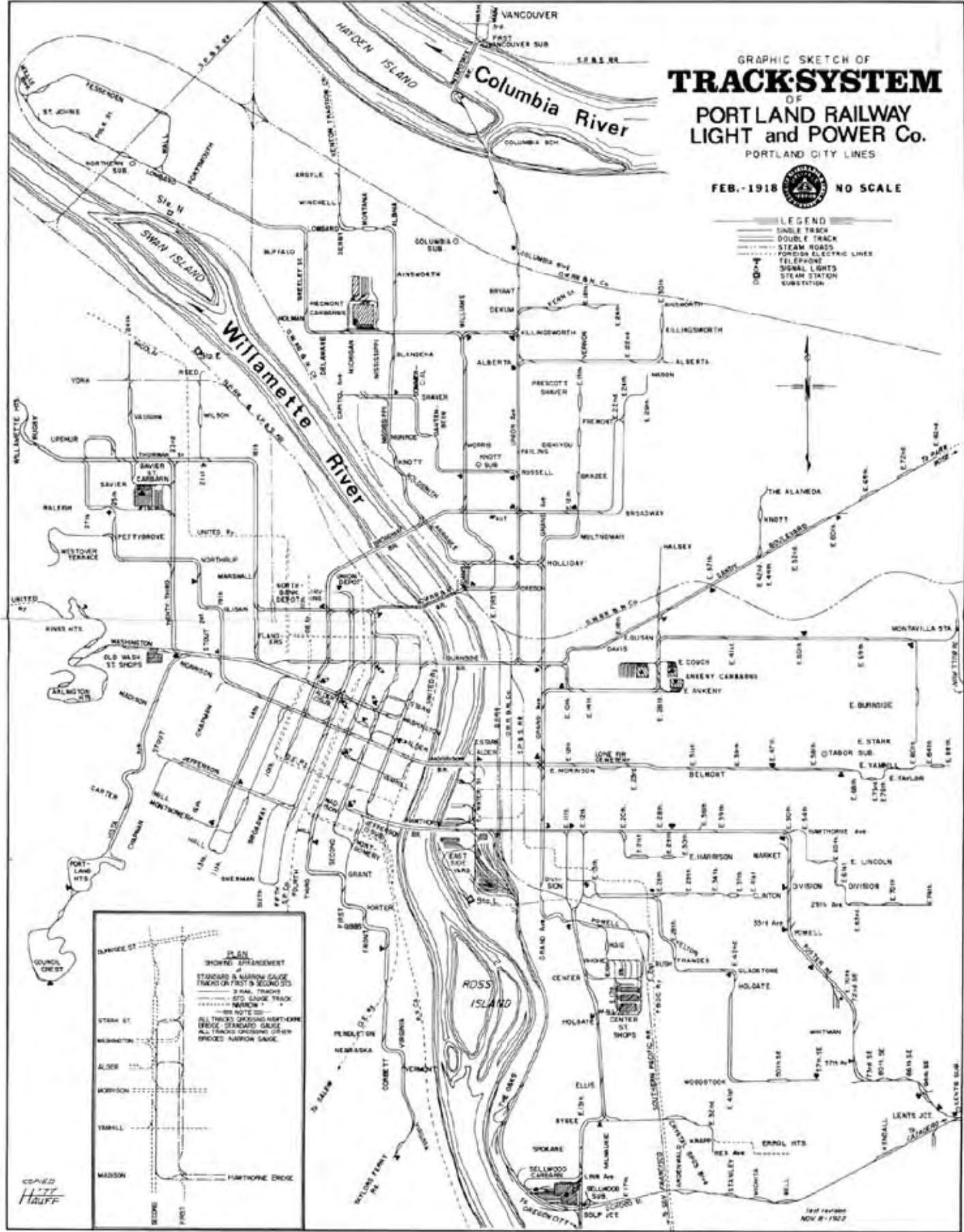


NE Martin Luther King Jr. Boulevard in 1975
(Photo: Oregon Historical Society)

GRAPHIC SKETCH OF
TRACK SYSTEM
 OF
PORTLAND RAILWAY LIGHT and POWER Co.
 PORTLAND CITY LINES

FEB.-1918  NO SCALE

- LEGEND**
-  SINGLE TRACK
 -  DOUBLE TRACK
 -  STEAM ROADS
 -  PORTLAND ELECTRIC LINES
 -  TELEPHONE
 -  SIGNAL LIGHTS
 -  STEAM STATION
 -  SUBSTATION



PLAN
 SHOWS TRANSVERSE
 STATIONS & NARROW GAUGE
 TRACKS ON FIRST & SECOND STS

 2 RAIL TRACKS
 8 FT GAUGE TRACK
 NARROW GAUGE

NOTE
 ALL TRACKS CROSSING HARTWORTH
 BRIDGE, STANDARD GAUGE
 ALL TRACKS CROSSING OTHER
 BRIDGES, NARROW GAUGE

CON'D
 H. T. HAUFF

1st Edition
 NOV. 1917

1918 Streetcar System Map
 Source: *Fares Please* by John T. Labbe

1. Why a Streetcar Network?

An enhanced streetcar network is being planned as part of a broader vision by the City of Portland to sustainably accommodate future population growth in a manner that will effectively manage the consumption of our limited natural resources and reduce greenhouse gas emissions. Expanding the streetcar system into a network of corridors will help achieve this by:

- ◆ Providing an attractive, high-quality transit service that will provide circulation along corridors, connect to and enhance the existing transit network, and link our neighborhoods with commercial districts and employment centers;
- ◆ Integrating into a comprehensive transportation system, including Portland's existing and planned pedestrian and bicycle network, which will reduce our dependency on the automobile and increase mobility for all modes of travel;
- ◆ Fostering partnerships between neighborhoods, developers and the City to coordinate or combine sustainability initiatives for stormwater management, localized (renewable) power generation, energy conservation, and sustainable (LEED) building design.

The Portland Streetcar System Plan (SSP) is a transit system planning project that will establish the direction for the expansion of the Portland Streetcar into corridors that are outside of the downtown core, and expand the role of the streetcar in Portland from a central urban circulator to an interconnected citywide system of streetcar corridors integrated with the City's transportation and land use network.

Anticipated Regional Growth

Current growth projections show that Portland's population will increase significantly by 2030. The Bureau of Transportation (BOT) is undertaking the SSP to study how streetcars can help the City accommodate increased population, provide an alternative to cars, and address global warming, while maintaining individual neighborhood identities.

Link to the Portland Plan

The Portland Plan, which kicks off in June 2008, is a process to determine how Portland will grow and transform in the next 30 years. During this process, the city and community members will discuss issues related to healthy urban growth, including reducing the effects of climate change, creating a thriving business environment, building green infrastructure, fostering human health and safety, addressing affordable living, preserving and creating well-designed and distinctive places, ensuring equity and continuing visionary planning for a better future. The SSP is one of the tools that will help implement the Portland Plan.

Portland Streetcar System Plan Mission Statement

The Portland Streetcar System Plan can play a key role in shaping the City by:

- Reinforcing walkable neighborhoods and vibrant main streets.
- Encourage sustainable development and infrastructure.
- Supporting reduction of vehicle trips.
- Supporting greater accessibility, housing options, employment and economic development.



Goals of the Streetcar System Plan

System Goals

- ◆ **Goal 1: Help the City achieve its peak oil and sustainability strategies.**
- ◆ **Goal 2: Provide an organizing structure and catalyst for the City's future growth along streetcar corridors.**
- ◆ **Goal 3: Integrate streetcar corridors into the City's existing neighborhoods.**

Corridor Goals

- ◆ **Goal 1: Be a viable transit option with adequate ridership.**
- ◆ **Goal 2: Have redevelopment potential.**
- ◆ **Goal 3: Demonstrate community support to make the streetcar system work well with other planning goals and mixed-use streetcar corridors.**

Planning for Sustainable City and Regional Growth

According to regional growth projections, the population of Portland will continue to increase at a rapid rate. As the City of Portland prepares for this growth, development opportunities that can reduce our carbon footprint, maintain Portland's valued livability, and take advantage of transit must be a part of the plan to accommodate our new neighbors. In 2007 the Portland City Council passed a resolution with the stated goal of reducing transportation related oil consumption in Portland by 50 percent by the year 2030, minimizing city residents' exposure to rising fuel prices. In order to reach this goal, alternative transportation must be expanded.



A Streetcar System as a Tool for the City's Peak Oil Strategy

In March 2007, Portland City Council accepted a report from the citizen-based Peak Oil Task Force. The report assesses Portland's vulnerability to increases in oil and natural gas prices and proposes ways the City can prepare to minimize the potential social and economic impacts. City Council adopted a resolution establishing a goal of reducing local oil and natural gas use by 50 percent over the next 25 years.

Implementation of a citywide system of streetcar corridors can help fulfill many of the Peak Oil Task Force recommendations. The recommendations emphasize land-use and transportation planning to minimize fossil fuel use and stronger policies and programs to reduce energy use in buildings. Key recommendations include:

- ◆ Engaging business, government and community leaders to initiate planning and policy changes.
- ◆ Supporting land use patterns that reduce transportation needs, promote walkability and provide easy access to services and transportation options.
- ◆ Designing infrastructure to promote transportation options and facilitating efficient movement of freight, and preventing infrastructure investments that would not be prudent given fuel shortages and higher prices.
- ◆ Encouraging energy-efficient and renewable transportation choices.
- ◆ Expanding energy-efficient building programs and incentives for all new and existing structures.
- ◆ Preserving farmland and expanding local food production and processing.
- ◆ Identifying and promoting sustainable business opportunities.
- ◆ Redesigning the safety net to protect vulnerable and marginalized populations.
- ◆ Preparing emergency plans for sudden and severe shortages of resources.



How Does the Streetcar Help Reduce Auto Trips?

Denser mixed-use development with good transit access results in reduced auto trips. Total daily vehicle miles traveled per capita decreases significantly for residents living in mixed-use, transit-rich neighborhoods because residents have walk, bike and transit access to trip destinations within close proximity. According to Metro data, residents are almost twice as likely to walk, and are 45 percent more likely to use transit in mixed-use neighborhoods. This is because mixed-use neighborhoods have trip destinations within closer proximity, making non-auto modes of travel more convenient and attractive.

Using Metro data, it has been demonstrated that places with good transit and mixed land uses have an estimated 58 percent auto mode use compared to an overall regional average of 87 percent. This reduction of 29 percent of auto trips is referred to as the (auto) "trip not taken."

Analysis of the existing Portland Streetcar experience indicates a savings of 60 million vehicle miles traveled per year due to added urban development, when compared to a similar suburban alternative.

Mode Split by Development Type

Land Use Type	Mode Split: Auto	Mode Split: Walk	Mode Split: Transit	Mode Split: Bike	Mode Split: Other	Daily Vehicle Miles per Capita	Auto Ownership per Household
Good Transit / Mixed Use	58.1%	27.0%	11.5%	1.9%	1.5%	9.8	0.9
Good Transit Only	74.4%	15.2%	7.9%	1.4%	1.1%	12.4	1.5
Remainder of Multnomah Co.	81.5%	9.7%	3.5%	1.6%	3.7%	17.3	1.7
Remainder of Region	87.3%	6.1%	1.2%	0.8%	4.6%	21.8	1.9

Source: Metro 1994 Travel Survey

Comparison of Mode Split Based on Neighborhood Character

This table shows data derived from the Metro 1994 Travel Behavior Survey that compares auto and non-auto mode shares. The data was analyzed by small geographic units that allowed for a comparison of areas with good transit and a high mix of uses with other parts of the region.

The Trip Not Taken

The relationship between land-use and transportation choices is well documented in the U.S. and Portland. Residents living in higher density development, with a mix of uses (commercial, civic, entertainment and residential) and good transit service, are significantly more likely to use transit, walk, or bike than use an automobile. This net decrease in automobile use, or the (auto) trip not taken, reduces the need to accommodate more cars on city streets and provide parking. The streetcar has demonstrated its ability to encourage denser development with a population that is less reliant on automobiles because destinations (e.g., home-work-services) are closer and the streetcar, along with other transportation options, is available.



Streetcars in Portland

Streetcar's role in making Portland more sustainable

How Can Streetcar Help Achieve Portland's Sustainability Goals?

As part of the Portland Plan effort, in 2007, the City of Portland Bureau of Planning assembled a Sustainability Technical Working Group (TWG) comprised of representatives from the Bureaus of Planning, Water, and Environmental Services, the Office of Sustainable Development and the Bureau of Transportation. The Sustainability TWG assessed the sustainability-related issues the City and the Region need to consider in planning for population growth and development in Portland during the next 30 years.

Implementing the SSP can play a significant role in addressing the four key issues facing Portland, as identified by the Sustainability TWG:

1. Global Warming

Transportation emissions are considered responsible for nearly 40 percent of all climate emissions; yet mobile sources are poorly regulated because of decentralized ownership and regulatory traditions. Given that the anticipated climate change will affect every part of the way we live and plan for the future, we must consider all available options to reduce the impacts generated by our current transportation system.

Portland's streetcar system can help balance and integrate sustainable technology with the existing neighborhood characteristics to provide a comfortable, convenient transportation choice. The streetcar system could connect the dots of centers by providing an interconnected network of corridors that adds vitality to nodes, maximizes land use and integrates with evolving infrastructure. It contributes to neutralizing the city's carbon footprint through the overall reduction of Vehicle Miles Traveled (VMT), reduction in trips by single occupant vehicles, and the reduction of allied greenhouse gases (GHG) through electrification of the transportation system and integration with human-powered modes. Most importantly, it encourages denser development, which results in fewer climate emissions from transportation as well as from housing.

2. Community Health

Human health is an aspect often overlooked in planning efforts, despite having value which is widely understood. In the last fifty years, remarkable advances in medical treatments have helped reduce the effects of illness and disease, as well as extend our life expectancies. However, as a society, we have incidentally increased our exposure to contaminants while simultaneously removing the daily activities that make us healthy, such as walking, to take care of our basic needs. Walking is more often an act of recreation than necessity, indicating how modern transportation has developed to the point where walking is mostly unnecessary.

Examining Portland's local air emissions reveals that vehicle corridors are the main source of these emissions. Proper

selection of streetcar corridors may potentially reduce pollution loads from vehicles of all types – from diesel-powered buses and trucks, to cars running on standard petroleum. By reviewing potential corridors in relation to existing walking and biking corridors, streetcar systems can be designed to support a truly multi-modal lifestyle with fewer emissions.

3. Social Equity and Access

Implementation of a streetcar network can provide a catalyst for greater social equity and access to an affordable society in terms of transportation, recreation, health care, housing and jobs. Encouraging a lifestyle that reduces vehicle dependency frees additional household income to apply toward better housing or a higher standard of living. By providing convenient access to basic goods and services such as food, employment and healthcare, streetcar corridors can facilitate a shift in mindset from day-to-day living to one in which people can think and plan for the future.

4. Constrained Fossil Fuel Resources

The current global energy system was developed on the presumption of a seemingly unlimited supply of fossil fuel resources such as oil, coal and natural gas. We know now that production of these resources will inevitably peak and, without careful preparation, steep increases in energy prices may disrupt our economies and society.

Secure and sustainable energy supplies are vital to Portland's future prosperity. A significant opportunity exists with the implementation of the Streetcar System Plan. While streetcar can promote and organize new compact development within a corridor, it is possible for each corridor to give rise to an expansion of green infrastructure strategies being planned by the City of Portland that will help address national, state and local energy and climate goals.

It is estimated that the new development around Portland's existing streetcar system has resulted in a 60 percent reduction in greenhouse gas emissions, as compared to what emissions would be for a similar capacity of residential and business units developed in the suburbs. This savings is realized through the reduction of motor-vehicle trips, consolidation and reuse of building materials, reduction in land consumption and less private and municipal infrastructure.

Keeping Portland Competitive

Planning Portland’s citywide streetcar system offers opportunities for economic development benefiting Portland residents and businesses. Streetcar represents a return to the community’s heritage of development-oriented transit in a way that is responsive to the increasingly global economic challenges of the 21st century.

Already, there is clear evidence of the ways in which streetcar enhances the City’s built environment:

- Since 1997, the majority (55 percent) of new development within Portland’s Central City has occurred within one block of the now-in-place Portland Streetcar alignment.
- Streetcar has also stimulated more intense urban building use consistent with development capacities intended via adopted Comprehensive Plan and zoning designations.

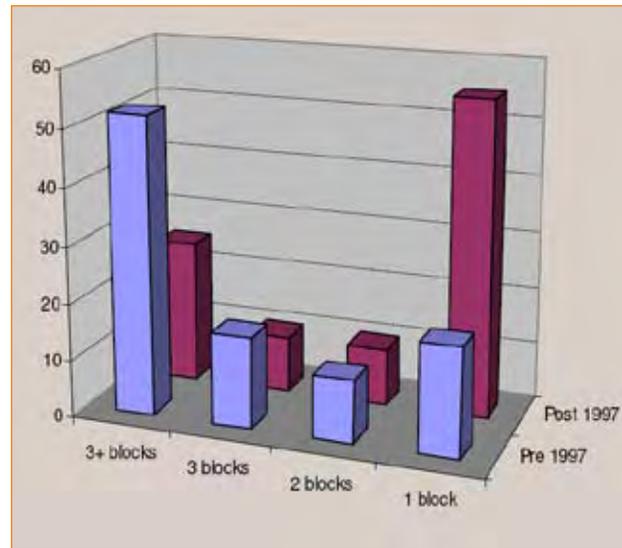
A citywide streetcar system is instrumental to encourage a pattern of transit-supportive, high quality urban development elsewhere in Portland. The type and scale of development experienced will vary across the city, in synch with neighborhood specific market needs and planning objectives. Results to date demonstrate a more vibrant mix of urban residential ranging from market rate to affordable housing together with enlivened commercial retail and employment opportunities oriented to streetcar corridors. For the metropolitan area, an important side benefit is avoidance of unnecessary suburban sprawl.

Not yet as readily apparent but no less significant is the contribution that streetcar can make to this region’s competitiveness as a good place to work and do business. Portland is quickly becoming an icon for urban vitality in the 21st century. Portland’s downtown streetcar is now recognized as a critical component of community infrastructure attractive to residents as diverse as empty nesters, young creatives and increasingly multi-ethnic families. In this era of reduced capacity for auto dependence, an expanded streetcar network that serves Portland’s neighborhoods has the potential to deliver the workforce to urban business locations preferred by Portland’s emerging industries as sources of future economic prosperity – ranging from software and graphic arts to market savvy tech metals and from apparel manufacture to organic foods and green design.

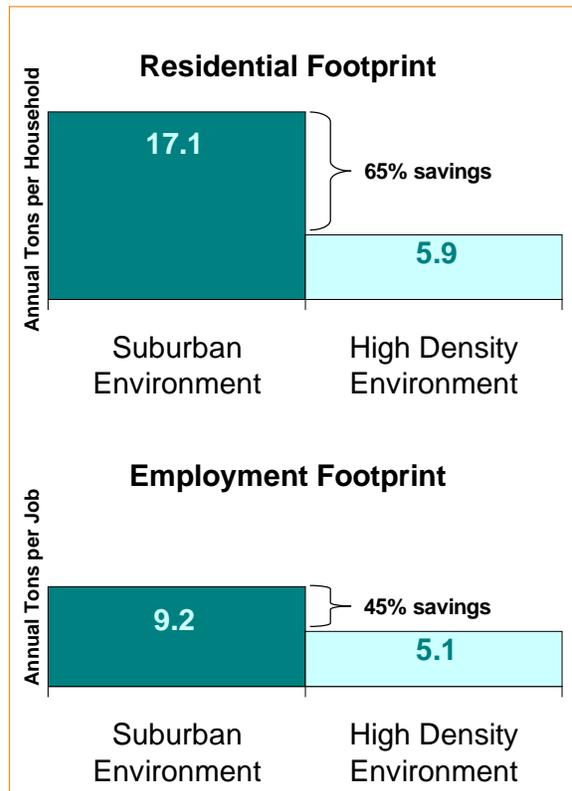
There are additional benefits from investing in streetcars instead of buses, including:

- ◆ Streetcars are flexible - not one size fits all.
- ◆ Economic analysis has shown a high return on the capital investment of streetcars (140:1 in downtown Portland and 9:1 projected in east Portland).
- ◆ Streetcars encourage development and transit.

The streetcar will play an important role in the City’s Peak Oil Strategy, however, it is only on mode of an integrated transit system that will be needed. Other transit modes may include expanded LRT lines, bus rapid transit and electric trolley buses.



Percentage of CBD Development Based Upon Distance from Streetcar
A 2005 study of real estate development within streetcar-served neighborhoods tracked Portland’s development trends (pre- and post-streetcar) based on distance from the alignment. It found that after streetcar investment was secured, lots within 1 block of streetcar captured 55% of new development within neighborhoods that streetcars passed through. (Source: E.D. Hovee & Company, Portland Streetcar Development Impacts, February 2008)



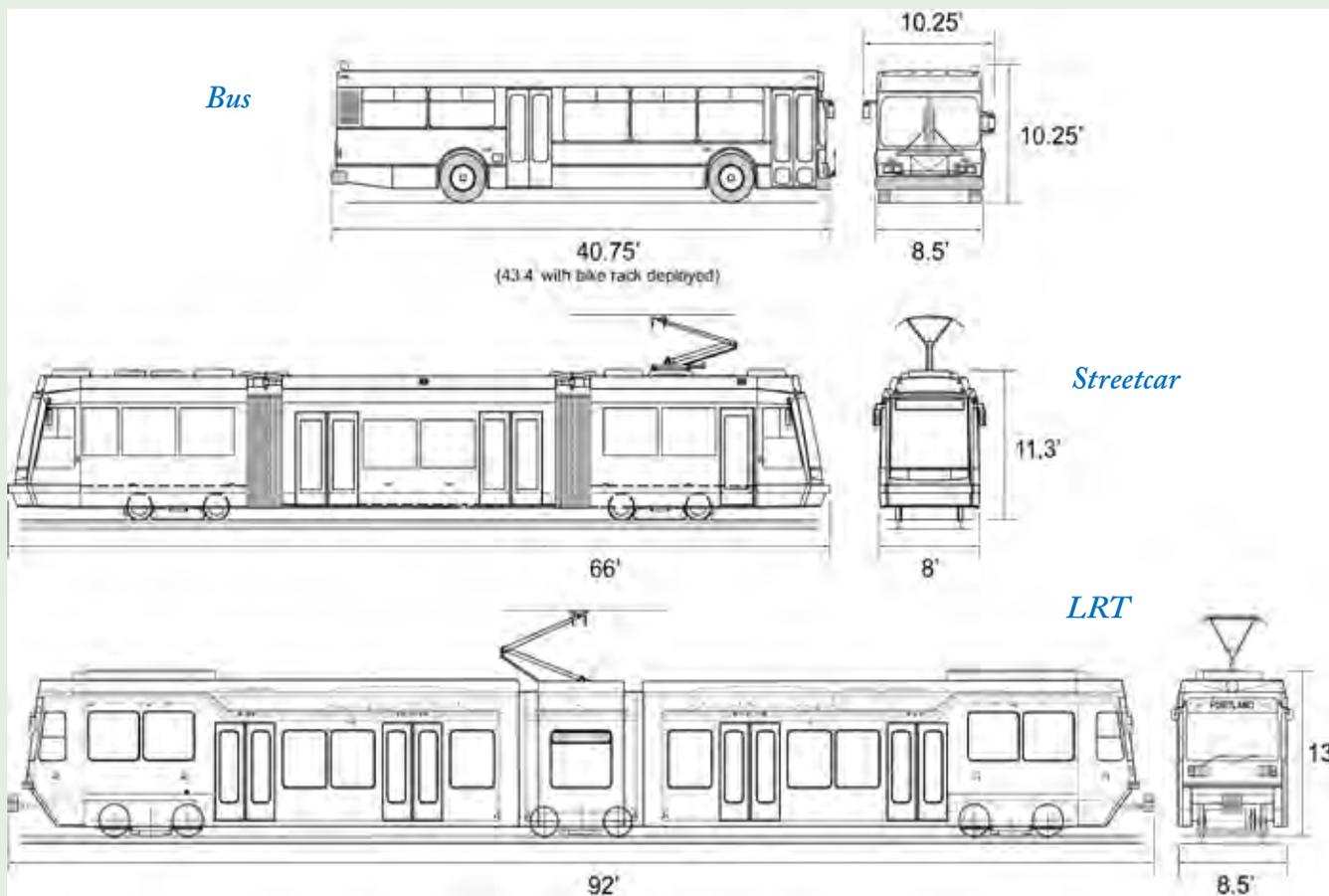
High/Density/Suburban Carbon Foot Print Comparisons
Carbon footprint modeling associated with the “Portland Streetcar Loop Project” estimated the potential for a 60 percent overall carbon footprint savings with high density urban development when compared to a suburban alternative. With employment, a 45 percent reduction in the carbon footprint was identified. (Source: E.D. Hovee & Company, Memorandum on Carbon Footprint Benefits Modeling, February 2008)

At-A-Glance: Streetcar - LRT - Bus Operational Characteristics

Streetcar, bus and light rail are the primary transit vehicles operating in Portland. The table below, which compares the operational characteristics of the three modes, illustrates streetcar's unique ability to combine the benefits of bus and light rail.

Portland Transit Vehicle Type			
	Streetcar	Light Rail Transit (LRT)	Bus (low-floor)
Vehicle Length	66 feet long 8 feet wide	92 feet long 8.5 feet wide	40 feet long 8.5 feet wide
Power Source	Overhead wire	Overhead wire	Diesel engine
Passenger Entry	Partial low floors, Doors on both sides	Partial low floors, Doors on both sides	Partial low floors, Door on one side
Passenger Boarding	Convenient and accessible boarding	Convenient and accessible boarding	Convenient and accessible boarding
Passenger Capacity	30 seats 51 standees 81 total 110 total "crush design"*	64 seats 69 standees 133 total (266 per train) 166 total "crush design"*	39 seats 12 standees 51 total 64 total "crush design"*
Amenities	Space for wheelchairs, bikes, strollers, etc.	Space for wheelchairs, bikes, strollers, etc.	Space for wheelchairs and bikes
Expected Vehicle Lifespan	30 Years	30-35 Years	15 Years
Cost per Vehicle	\$2.9 Million	\$3.8 Million	\$400,000

* or total "design crush load"



What is the Streetcar Experience in Other Cities?

More than a dozen North American cities have streetcar systems that have either expanded or started operations in the past 15 years. Additionally, at least twice as many other cities have new systems or new lines under active planning. The primary attractions of streetcars are the ability to add a visible rail system at a minimum capital investment, and the ability to create a circulator that connects into a high-capacity network without requiring additional extension or expansion of a more expensive high-capacity mode. Streetcars are also popular because they once did and still can fit into densely developed, pedestrian-oriented, urban neighborhoods.



Memphis, Tennessee

In Memphis, Saturday is the highest ridership day, contrary to common transit experience. (Photo: Wikipedia)



Toronto, Canada

The Toronto Transit Commission estimates that 60 percent of streetcar riders are "choice" riders - those who have a car, but choose to take the streetcar instead. (Photo: Wikipedia)



Tacoma, Washington

Since Tacoma began revitalizing its downtown and planning around the light rail/streetcar stops, more than 2,000 new housing units have been permitted. (Photo: <http://tacomastreetcar.org>)

Streetcars & Buses: Complementary Services

Prior to the 1950s, streetcars provided the backbone of the Portland area's transit system. In fact, many of today's bus lines operate along routes that were originally defined by where the streetcar tracks were laid in the late 1800s and early 1900s. The development patterns that followed the original streetcar tracks now define activity centers that serve as important transit markets for TriMet's bus and light rail system.

As we consider re-introducing streetcars to serve Portland neighborhoods, choices will need to be made about how to best integrate the proposed streetcar routes with existing bus service. This streetcar/bus integration strategy provides an opportunity to create a transit system that meets the needs of neighborhoods by tailoring transit service to facilitate their unique travel requirements.

For example, adding streetcar to the inner portion of an existing radial bus route can provide an opportunity for the outer portion of the existing route to operate with limited stops on the inner portion. This operating strategy would provide a faster bus trip for the longer distance trips while providing the inner portion with streetcar service as well as connections to the bus route at key transfer points.

As planning for a streetcar system proceeds, collaboration among the City, TriMet and neighborhoods will be key to identifying and implementing transit strategies that meet local needs and optimize the attractiveness and convenience of the bus and streetcar elements of an integrated transit system.

Can I Walk Faster Than a Streetcar?

Typically, streetcars accelerate from platform stops or traffic control points and will generally reach a speed of 15 to 25 miles per hour. Factoring in platform stops and minor delays associated with mixed traffic operations, the average speed from one end to the other is between 7 and 12 miles per hour. The average speed of a person walking is 3 miles per hour. Whether a person can walk faster to a destination than taking a streetcar depends on the length of a trip and the amount of time spent waiting at a stop. By using Portland Streetcar's website which shows real-time "next arrival" information, this wait can be minimized. The convenience of a streetcar trip will then depend more on the frequency of service, known as "headways."

Streetcar Headways

Currently, streetcars in Portland are estimated to arrive every 12 to 15 minutes. Service in the downtown area will increase to 6-7 minute headways with the opening of the Streetcar Loop Project on the Eastside. Frequency will generally increase as the system expands. The implementation of any streetcar extension involves an analysis of the appropriate streetcar service and operating headways. More frequent service offers more convenience, which will encourage ridership but will increase overall operating costs. Funding is critical to the equation of providing the appropriate number of streetcars along the line at any one time.

What Are the Different Kinds of Streetcar Service?

A streetcar is usually a slightly smaller vehicle than those used for most light rail transit (LRT) services, and generally operates within the street right-of-way in single-car units. Streetcars can operate in both mixed traffic and reserved rights-of-way. In mixed traffic, a typical streetcar vehicle travels at speeds up to 25 miles per hour. There are typically three levels of streetcar service that can be provided:

Urban Circulator Service (like existing Portland Streetcar)

- ◆ Has frequent stops with spacing similar to a bus
- ◆ Runs in mixed traffic, usually in the right lane
- ◆ Minimal priority systems at traffic signals
- ◆ Typical operating speeds of 10 to 15 miles per hour

Enhanced Local Service (potential SSP corridors)

- ◆ Expanded service coverage, approximately 3 to 5 miles from the core business district
- ◆ Usually runs in mixed traffic, typically in the left lane
- ◆ May introduce streetcar priority at traffic signals
- ◆ Typical operating speeds are 10 to 25 miles per hour

Priority Service (proposed Portland to Lake Oswego Streetcar)

- ◆ Has less frequent stops
- ◆ Primarily runs in a reserved right-of-way
- ◆ May have streetcar-priority at traffic signals
- ◆ Typical operating speeds are 20 to 35 miles per hour

The Rapid Streetcar Concept

Are there potential corridors for Portland?

The rapid streetcar concept aims to combine the best features of streetcars and light rail transit (LRT) to achieve faster commute/travel times than streetcars and lower system costs than light rail. Streetcars are typically designed to go shorter distances in central cities, densely populated mixed-use centers and neighborhoods. Streetcars are also typically designed to operate in mixed traffic, preserving street traffic patterns.

LRT typically functions as regional high-capacity transit (HCT), generally traveling in a separated right-of-way with relatively fast-moving, larger-capacity vehicles designed to rapidly transport large numbers of people between suburban and urban centers.

The rapid streetcar concept would apply some of the LRT features to streetcars to improve travel times while keeping capital costs lower. It would combine features of a semi-exclusive transitway and transit priority features within the street right-of-way to achieve faster travel times and maintain lower system capital costs. This could introduce two new levels of service to Portland's system.

Several corridors under consideration for the Streetcar System Plan are prime candidates to introduce Enhanced Local Service. These corridors are major arterials with 4 to 5 lanes and on-street parking such as NE Sandy Boulevard and SE Foster Road.

In Portland there are potential corridors for introducing priority service. Currently, the region is undertaking a study to extend the existing streetcar system along a former railroad right-of-way from the South Waterfront District, through John's Landing and south to Lake Oswego. SE Foster Boulevard and 122nd Avenue are also candidates where there may be sufficient right-of-way width to introduce streetcar priority lanes. Metro's regional High Capacity Transit (HCT) study will examine potential high-capacity transit service along corridors such as SE Powell Boulevard and SW Barbur Boulevard where a rapid streetcar concept will likely be one of many transit technologies considered.

Drawing from the experiences from other cities around the world, enhancements to the streetcar operations can significantly increase average speeds:

Service	Average Speeds
Urban Circulator Service	10 to 15 mph
Enhanced Local Service:	10 to 25 mph
Priority Service:	20 to 35 mph



Several corridors are prime candidates to introduce enhanced local service.

San Francisco's Transit Preferential Streets Program

San Francisco's Transit Preferential Streets (TPS) Program is a citywide program designed to make surface transit lines operate more quickly and efficiently on city streets. This makes public transit more attractive to riders and uses the public's investment in transit infrastructure more effectively. Most of San Francisco's transit corridors involve mixed operations within city streets. In this environment, transit vehicles are susceptible to delays caused by automobiles and delivery trucks, and other on-street activities can cause less reliable service. The TPS Program promotes corridors that provide the most efficient transportation function for the most number of people using the street, not necessarily the most number of vehicles.

To accomplish this, San Francisco has developed a toolbox of street treatments that can be applied to streets or street segments within a TPS corridor. The toolbox of potential TPS treatments includes:

- ◆ Timing signals to match transit vehicle flow
- ◆ Signal priority systems for buses and streetcars
- ◆ Bus bulbs (sidewalk extensions at bus stops)
- ◆ Boarding islands for center lane boarding
- ◆ Transit lanes
- ◆ Contra-flow lanes
- ◆ Exclusive transit rights-of-way (raised or reserved medians or track lanes)
- ◆ Transit stop re-spacing and relocation
- ◆ Transit exceptions to turn restrictions

These treatments are aimed at allowing the transit vehicles to flow more smoothly and quickly between stops; however, implementing TPS treatments often comes with trade-offs for the use of limited street space.

San Francisco's Transit-First Policy resolves these trade-offs by favoring transit needs over auto needs. In practical terms, various uses must be accommodated within the limited right-of-way, and this has been resolved in a number of ways. For instance, when bus lanes were installed for the Geary Rapid Bus Project, the number of all-day auto lanes on Geary was reduced from two lanes to one. To ensure that the street functioned effectively with this change, parking was removed at intersections to install dedicated right- or left-turn lanes in the curb lane, so that traffic waiting to turn would not block the through movements. On-street parking was converted to metered truck-loading to ensure the availability of truck loading spaces so that trucks would not double-park and block either the transit lane or the one remaining auto lane.



Transit Priority Streets

San Francisco's Transit Preferential Streets Program (TPS) is designed to make streets more transit friendly by giving public transit priority over automobiles on city streets. This is accomplished by providing exclusive right-of-way for transit, signal priority, automobile-turn restrictions, construction of curb extensions at bus stops and targeted enforcement.

3. What is a Potential Streetcar Corridor?

Potential streetcar corridors are those streets and boulevards that are best suited to introduce new modern streetcar service to Portland's neighborhoods and business districts. They are termed "corridors" because the influence of a streetcar transit investment will extend beyond the immediate street. Based on the success of streetcar in Portland and other cities, the permanence and identity a streetcar corridor brings could help catalyze and organize in-fill development and promote more pedestrian-oriented activity along the corridor.

When a candidate corridor identified by the SSP moves forward through alternatives analysis into design and implementation, the orientation of streetcar tracks within the street will be determined.

Streetcars - then and now (below and below right)



Streetcar on Belmont in the Sunnyside neighborhood, circa 1900. (Photo courtesy City of Portland)



Streetcar today continues to integrate with automobiles and pedestrians along bustling corridors. (Photo courtesy URS)

Integration Into the Public Right-of-Way

The SSP public outreach effort works with community leaders to better plan our neighborhoods; incorporating a balanced approach to transportation by including more emphasis on public transit, biking and walking.

A balanced neighborhood transportation system is one that manages the demand for circulation within and through the neighborhood while minimizing conflicts between different types of activity that share the public right-of-way. The introduction of streetcar corridors will be implemented to minimize any potential impacts to neighborhood, city, and regional circulation patterns. Streetcar tracks are generally constructed to fit within existing travel lanes. As the streetcar corridors advance into the first stages of design, the location

of the streetcar infrastructure (tracks, platforms and poles) will need to integrate into the existing street to minimize any conflicts with pedestrians, bicyclists, cars, trucks and buses.

A modern streetcar system has the capacity to enhance the overall transit network while providing circulation along a corridor and connections to local commercial districts. The availability of a streetcar provides a highly effective means to support walkable communities by providing a high-quality option for the short transit trip. There are, however, many pressures to accommodate multiple uses within the public right-of-way. Automobile circulation, on-street parking, bike lanes, crosswalks and freight access are all critical for neighborhood vitality.



How Would a Streetcar Corridor Accommodate Growth While Respecting the Unique Character of Each Portland Neighborhood?

Portland’s neighborhoods are the lifeblood of the City’s cultural, historical and social heart. Because of streetcar’s human scale, friendly presence and approachable design, it fits into and can contribute to each neighborhood’s special personality and character. Streetcar has brought attractive, distinctive and sustainable architecture and activities that strengthen neighborhoods and create healthy places for people.

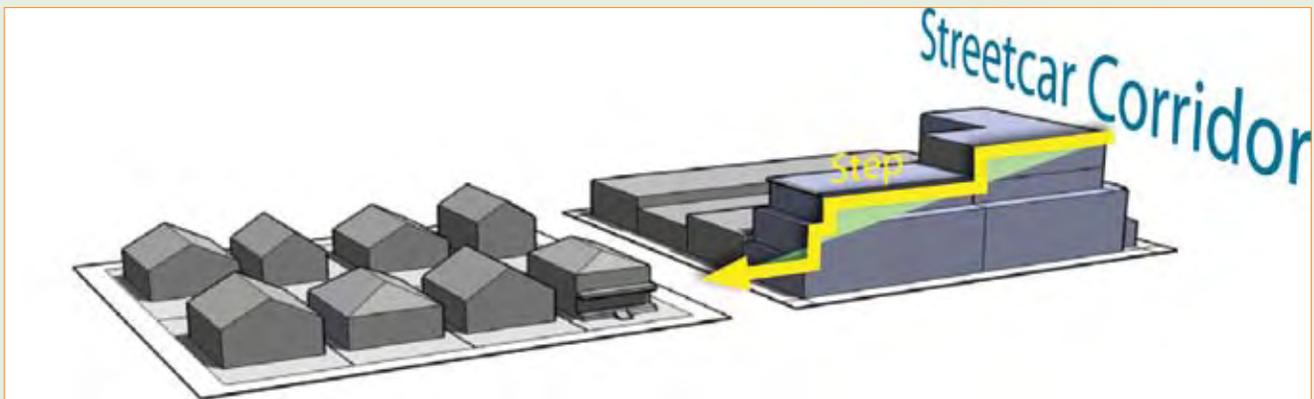
A streetcar system is a particularly effective tool to connect and shape neighborhoods. Streetcars connect neighborhoods by linking up activities, destinations, and the regional transit network. They shape neighborhoods by stimulating redevelopment, supporting active uses, promoting public-private investments and creating places where people want to be. These types of neighborhoods make our community more livable and help the surrounding region by preserving farm and forest lands, protecting area rivers and streams, and reducing air pollution. They also directly reduce the threat of global warming.

The eventual infill with mixed use development within future streetcar corridors will resemble the form of buildings and urban spaces that shaped the popular places of the original streetcar system. Existing land use, zoning patterns and neighborhood design guidelines protect community values and reinforce the fabric of neighborhood-scale commercial and retail streets such as Alberta, Killingsworth, Sandy and East Burnside.

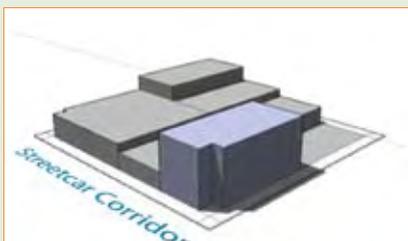
The streetcar-oriented development will best integrate into the neighborhoods through careful consideration of the types and characteristics of the architectural and urban form and function of the surrounding neighborhoods. Several building design techniques can be used to reduce the impact of new development on established neighborhoods, such as incorporating elements of nearby quality buildings, including their details, massing, proportions and materials.

Many neighborhoods are already experiencing in-fill development. The streetcar can serve as a catalyst for organizing the new development, or redevelopment.

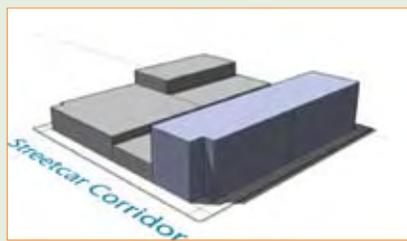
Building form will be an essential means to shape new development along a streetcar corridor to provide a compatible relationship of building heights and massing with surrounding neighborhoods.



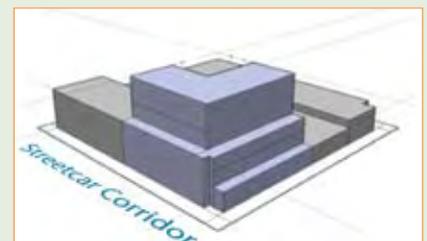
Building setbacks are an essential architectural tool for minimizing the effect of adding higher density structures adjacent to lower density land uses. Community Design Guidelines and neighborhood plans can define the framework for infill development and ensure that it fits into existing neighborhoods and respects existing neighborhood character.



50 by 100-foot infill in Commercial Storefront zone (CS) at 45-feet in building height.



50 by 200-foot infill in Commercial Storefront zone (CS) at 45-feet in building height.



100 by 100-foot infill in Central Commercial zone (CX) at 75-feet in building height.

Building form is particularly important for infill development. The above drawings illustrate 3 examples of adding context sensitive higher density mixed-use structures in three different commercial zones.

Scale of development and integration into neighborhoods

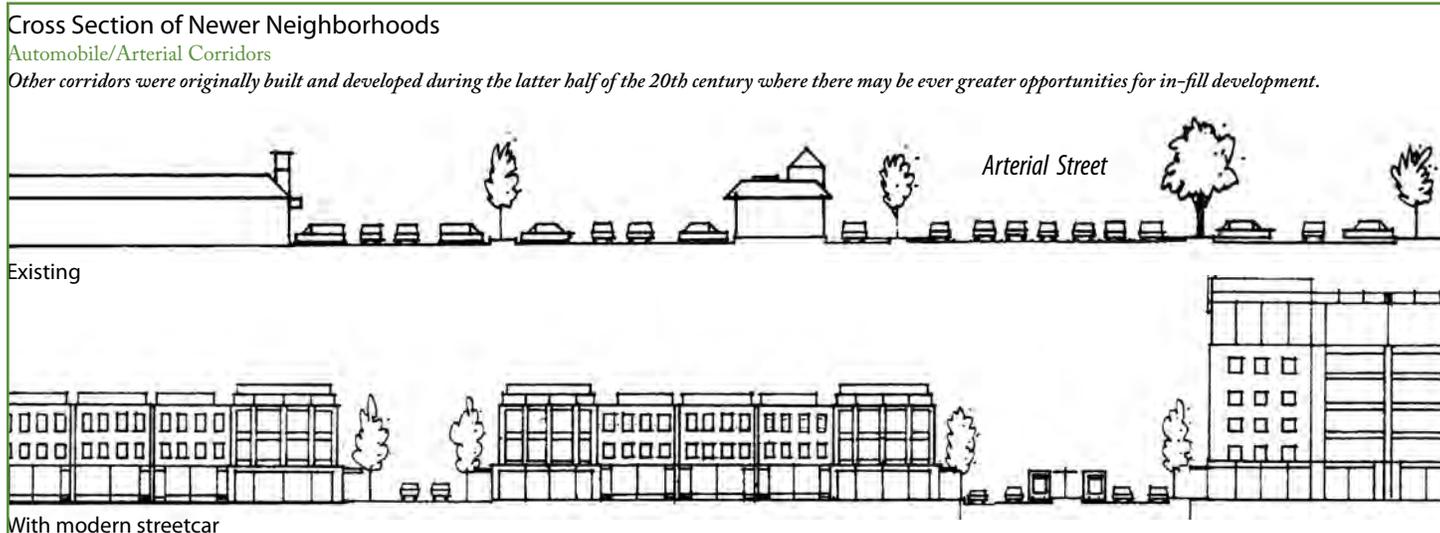
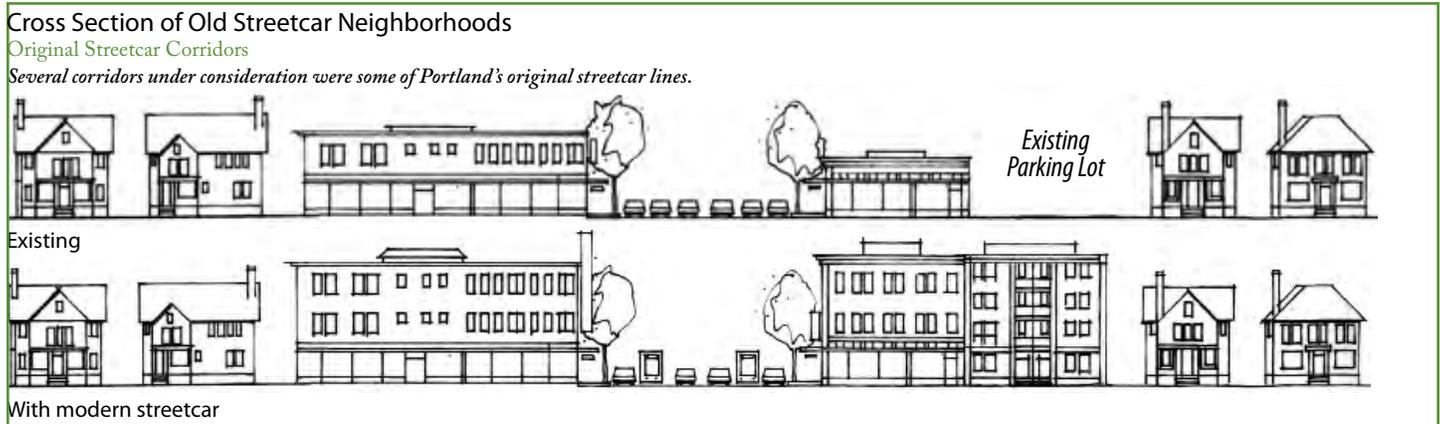
Development along a streetcar corridor will be of a scale that is consistent with existing land-use zoning laws. However, intensifying development to the existing capacity could mean significant changes to a corridor’s environment in regard to the amount of motorized and non-motorized traffic and pedestrian activity. Therefore, the recommendations for the initial corridors will be made in close coordination with the public through open houses, neighborhood meetings and district group meetings. Further outreach to the public will be made by the Bureau of Planning with their update of the Comprehensive Land Use Plan (called the Portland Plan).

Portland’s neighborhoods vary by their origins, location and terrain, which will influence whether a corridor may be conducive to the introduction of modern streetcar service. Overall, there are four styles of Portland neighborhoods:

- ◆ **Downtown Neighborhoods** which may be best suited for additional streetcar service due to the allowable densities and their proximity to Portland’s central business and entertainment districts; as is evident from the development surrounding the existing streetcar line.
- ◆ **Southwest Neighborhoods** would be more challenging due to lower density (single-family) neighborhoods served by more curvilinear, sometimes narrow streets. The primary corridor under consideration is along or parallel to Macadam Avenue to serve John’s Landing, while corridors

like Barbur Boulevard will be considered for higher capacity transit technology through Metro’s High Capacity Transit Study.

- ◆ **Eastside “Streetcar Neighborhoods”** that were originally served by streetcars in the first half of the 20th century. The best opportunities for infill development are along the commercial corridors that border or run through these neighborhoods. Examples of former streetcar streets that are candidate corridors for modern streetcar service include NE Martin Luther King Jr. Boulevard, N Lombard, NE Broadway & Weidler, NE Sandy Boulevard, SE Belmont and SE Hawthorne Boulevard.
- ◆ **Outer Eastside Neighborhoods** typically east of Interstate 205. The land use patterns and uses in these areas evolved when the transportation focus was on automobiles, and therefore the resulting land uses and patterns are reflective of this auto influence. Typically, the commercial corridors in this part of town are characterized by wide thoroughfares, surface parking lots, and one- and two-story, single use buildings set back from the street. These areas commonly have very limited pedestrian facilities. Streetcar service could have the greatest influence on urban form in these areas, but it will require community acceptance of land use changes, including higher density mixed-use development and more pedestrian facilities. Examples of East Portland corridors are 122nd Avenue and the Gateway “Loop.”



How Does Streetcar Reinforce Portland's Urban Form?

Portland's successful urban form is, in part, the result of a holistic strategy that integrates land use, transportation, economic development, and sustainable practices. Urban activity centers and corridors are the most distinct and significant features of Portland's urban environment. They are largely the result of the understanding that land use and transportation are inter-dependent tools that shape the city, and are key to successfully accommodating economic and population growth.

Streetcar service along some of the urban corridors will act as an organizing tool and catalyst for new development that will support the continued evolution of the city's urban form. Streetcars are a desirable mode of urban transit service because they provide a high quality ride. They integrate well into the existing activity centers because they are human scale and easy to access. By increasing pedestrian activity along the corridor, streetcar leads to higher visibility for corridor retail and businesses. Streetcar service also helps to support development of higher-density, mixed-use projects.

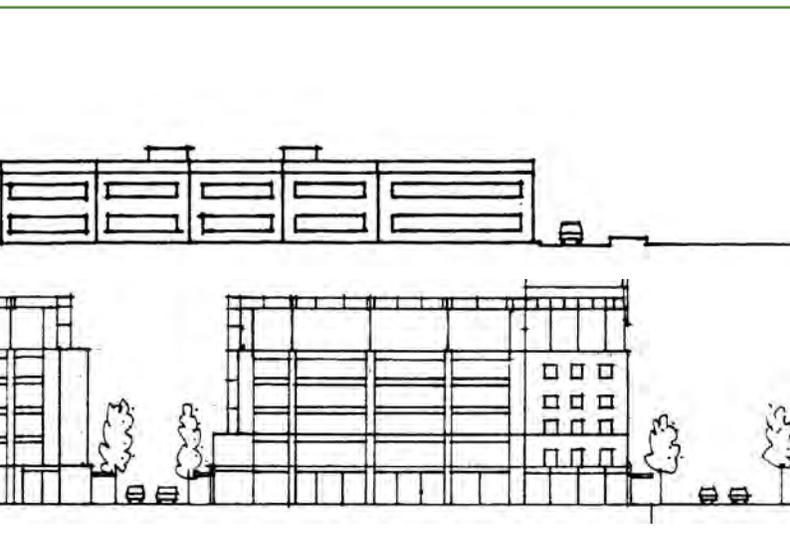
A fundamental concept of the Region 2040 Growth Concept is to focus housing and employment growth into higher density, mixed-use, pedestrian-friendly activity centers that are connected by high-capacity transit corridors. One of the key ingredients to success for these centers is providing a multi-modal transportation system that ensures transportation choices and continued mobility of people and goods throughout the region. Also, focusing new development into existing urbanized areas that already have most urban infrastructure (such as police and fire protection, sewer and water service, and schools) reduces the financial and environmental costs of extending those services farther out along the urban fringe, and it reduces the need to expand the urban growth boundary.

An expanded streetcar network could be a catalyst to implement numerous city and regional land use, transportation and urban growth management goals. Some of the goals that an expanded streetcar system could help realize are:

- ◆ Reduced reliance on automobiles
- ◆ Higher density, mixed use communities
- ◆ More livable communities
- ◆ Better pedestrian environments
- ◆ More sustainable communities and transportation choices

Planning for future streetcar corridors will also require thoughtful coordination with other modal transportation planning efforts, such as those for bicycles and freight. Conflicting demand for limited right-of-way space will require trade-offs and cooperation between competing interest groups. Ultimately the goal of creating vibrant and livable communities will lead to synergistic benefits for everyone.

Providing a multi-modal system will promote better health, as is evident in the fact that New Yorkers are more fit than most city residents across the nation since walking to/from transit stops is a primary means of transportation.



Clean-Corridor Coordination: The 3C Concept

What is the 3C concept?

3C is an implementation strategy for Streetcar System Plan corridors that aims to achieve multiple City objectives related to “clean” technologies and infrastructure. In addition to implementing streetcars – one of the lowest-emission transit options available in Portland – 3C includes working with the Office of Sustainable Development’s (OSD) Clean Neighborhood Energy program and the Bureau of Environmental Services’ (BES) initiative for healthy urban watersheds. The 3C concept links the planning efforts for clean infrastructure investments now to establish the framework of multi-functional sustainable growth corridors for the City of the future.

BOT: Streetcars

Streetcar investments in Portland have helped bolster the City’s reputation for integrated land use and transportation planning. Streetcars are exceeding ridership projections and are moving more than 9,000 people per day with minimal emissions. Streetcars are also helping to create healthier neighborhoods where walking and green buildings are becoming the norm, not the novelty.

OSD: Clean Neighborhood Energy

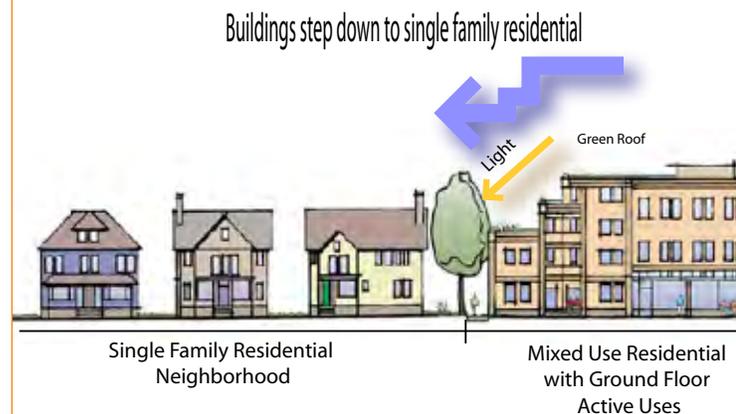
The Office of Sustainable Development (OSD) Clean Neighborhood Energy program is fostering the creation of neighborhood energy districts to capture the potential to

Leveraging 3C Corridors

The 3C approach can be a leveraging tool for city-wide initiatives currently under consideration, including:

- ◆ Stormwater management systems and green street design
- ◆ Streetscape improvements to emphasize pedestrian and bikes as primary modes
- ◆ “LEED” Neighborhood Development building incentives
- ◆ Incentives for efficient building and construction processes through the use of green and recycled materials
- ◆ Affordable housing, affordable living, and accessibility goals
- ◆ Integrating wind and solar generation systems into public right-of-way
- ◆ Neighborhood parking strategies
- ◆ Car-sharing and other incentives to reduce automobile trips

Green



Lloyd D. Lindley, ASLA
DRAFT June 2, 2008

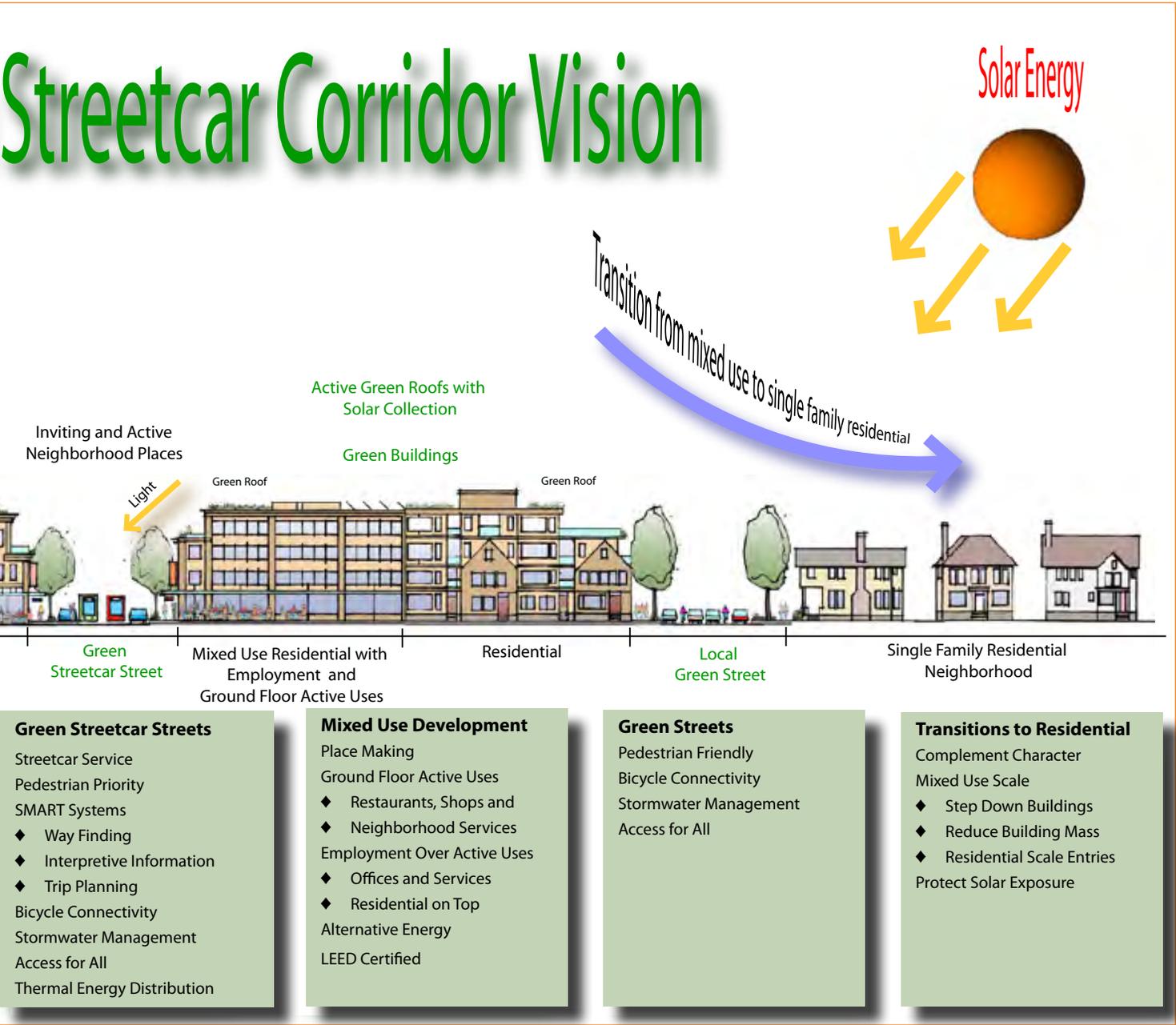
produce energy – both thermal energy and electricity – at the neighborhood scale. These districts will help to dramatically reduce emissions and our carbon footprint (after construction). Potential sources of thermal energy include solar, ground- or water-source heat exchange, and clean biomass. The thermal distribution systems can be integrated with streetcar construction by installing linear energy vaults under streetcar tracks when the street pavement is removed for construction.

natural hydrologic function. The goal is to integrate stormwater management and development using natural systems and green infrastructure instead of relying exclusively on expensive underground pipes, culverts, inlets, and treatment plants. This is a coordinated approach with streetcar construction and streetcar related development for management of stormwater at the source and on the surface.

BES: Watershed and Sustainable Stormwater Program

The Bureau of Environmental Services' initiative for healthy urban watersheds focuses, in part, on restoring the watershed's

With strategic coordination, BOT, OSD and BES can achieve greater results together than planning for implementation independently. Emission-free travel, clean energy distribution and integrated stormwater management can help to leverage more efficient, high performance green buildings, resulting in an overall healthier urban environment for the next generation.



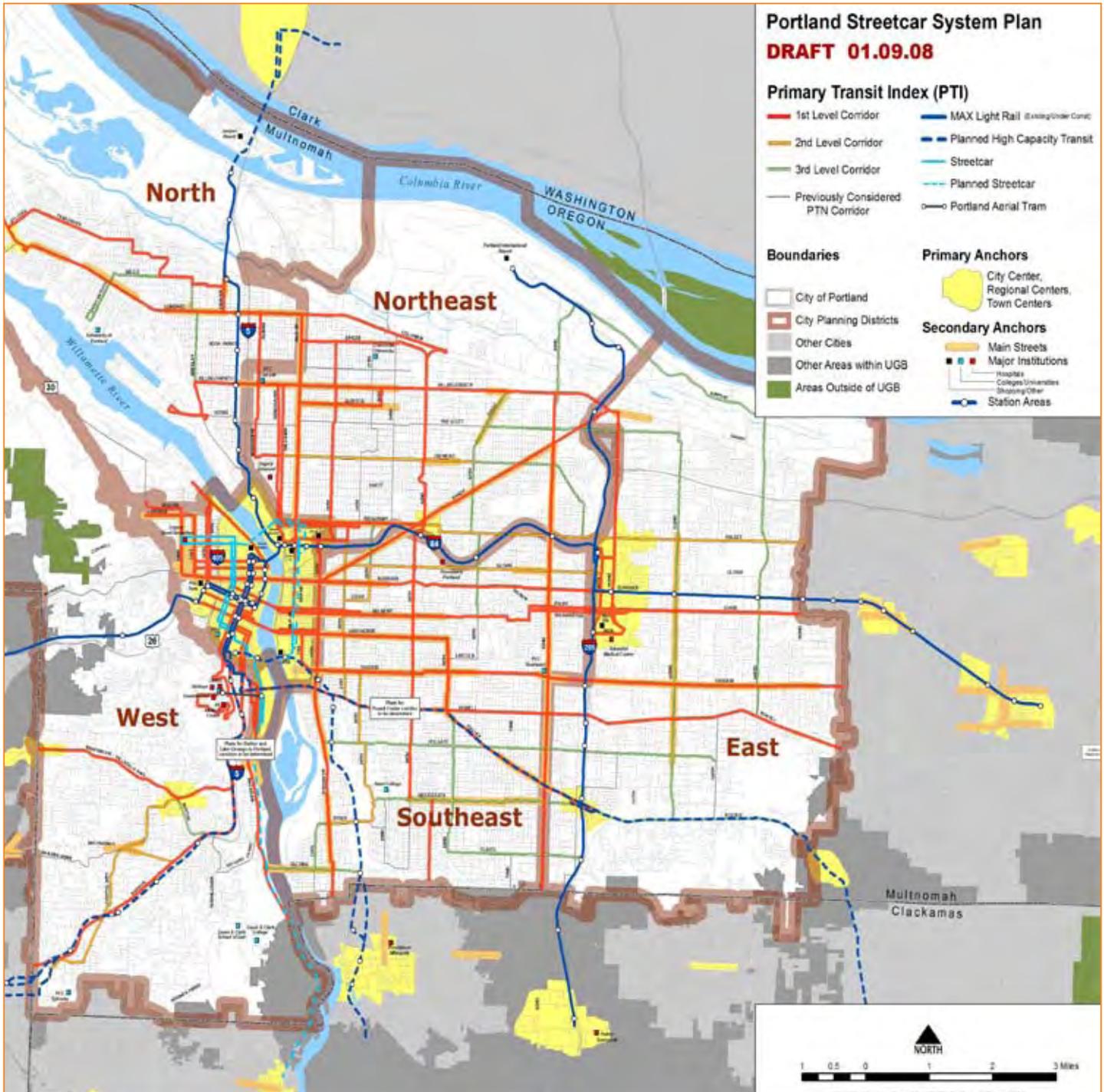
4. What is the Streetcar System Planning Process?

The Primary Transit Index (PTI) Study

The Primary Transit Index (PTI) Study was completed by the City and consultant team in late 2007 and set the stage for the Portland Streetcar System Plan (SSP) effort. The PTI study categorized existing and potential transit corridors within the city using two primary measures:

1. Transit Orientation Index (TOI) score - a measure that evaluates the relative transit attractiveness of a corridor based on many factors, including density of households, density of general employment and density of retail employment.
2. Anchor Requirements - the presence and/or absence of primary or secondary transit attractors (or anchors) at the ends or within a corridor.

Primary Transit Index Map. Prepared by URS.



Evaluation Measures

Each phase uses evaluation measures in the following general topics to evaluate the corridors:

1. Public Support

Demonstrates community support and ensures that the streetcar system will work well with other planning goals and mixed-use development vitality.

2. Technology and Operations

Evaluates current bus and streetcar technologies and identifies optimal operational characteristics appropriate for a city-wide streetcar network.

3. Transportation and Transit

Identifies corridors that can provide the best transit service with adequate ridership and ensures that there are no significant gaps in the city-wide streetcar corridor coverage; that potentially-competitive streets/corridors have not been overlooked; and that only corridors that are viable transit options are carried forward.

4. Economic Development

Catalyzes development around streetcar lines and provides a structure to organize the City's future growth along main streets and streetcar corridors. These measures examine vacant and under-utilized lands, development capacity as defined by current zoning, additional residential capacity, and an assessment of market conditions in the various corridors.

5. Urban Form and Land Use

Provides an organizing structure and catalyst for the City's future growth along main streets and streetcar corridors and helps to preserve the character of the City's existing neighborhoods.

6. Green Corridor

Assesses sustainable development and infrastructure related policies and development incentives that would be applicable to streetcar corridors, and incorporates sustainable practices into the system plan and individual corridors.

Streetcar System Plan Project Schedule

June to December 2007

- ◆ Primary Transit Index Study
- ◆ Initial Public Open House Meetings

September to December 2007

- ◆ Project evaluation methodology including Goals and Measures for each phase of corridor screening
- ◆ Initiate public involvement process
- ◆ Create System Advisory Committee (SAC)
- ◆ Create Development Oriented Transit Team (DOTT) – technical team

January to December 2008

- ◆ Corridor screening process
- ◆ Initiate District Working Groups (DWG)
- ◆ 2nd round of Public Meetings

January to March 2009

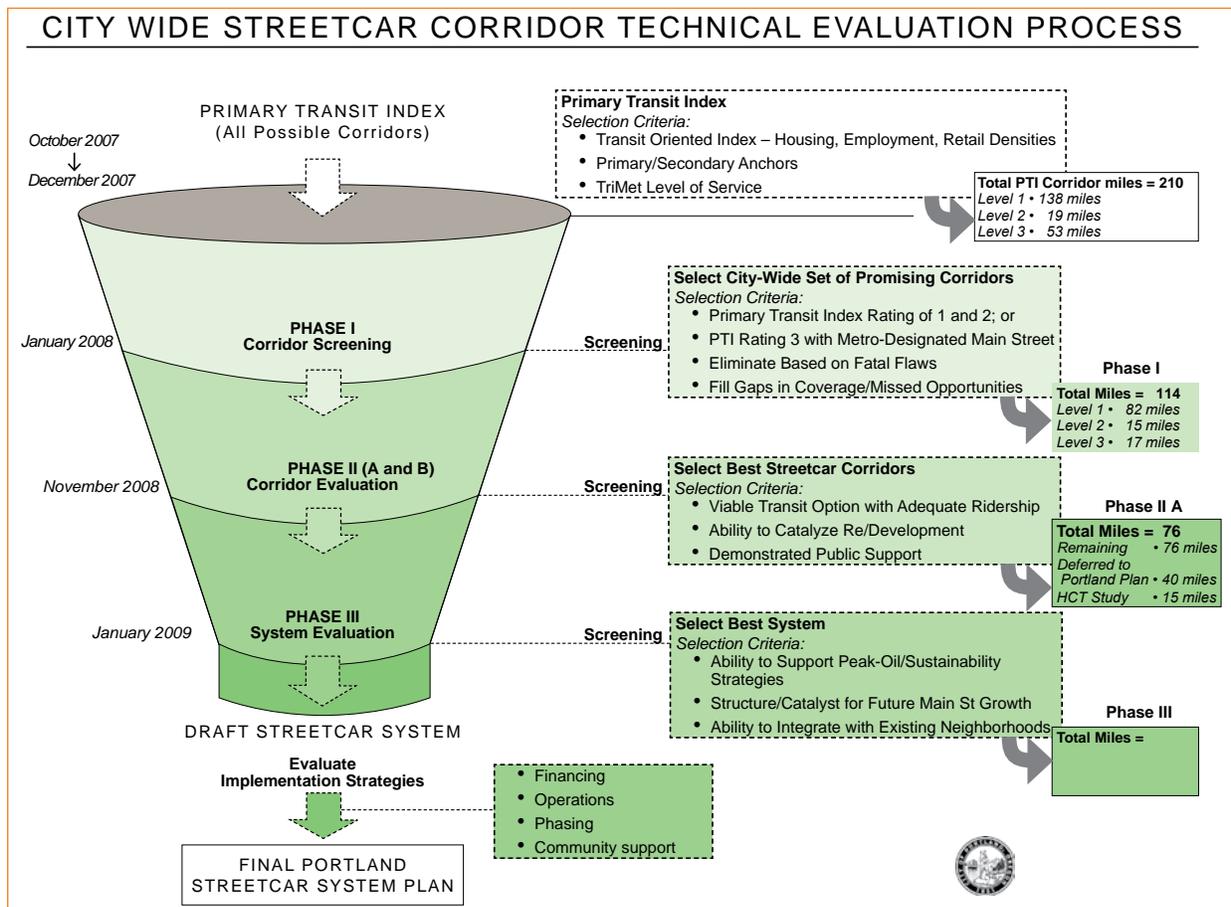
- ◆ Develop System Plan Implementation Strategy
- ◆ 3rd round of Public Meetings
- ◆ SAC recommendations

March/April 2009

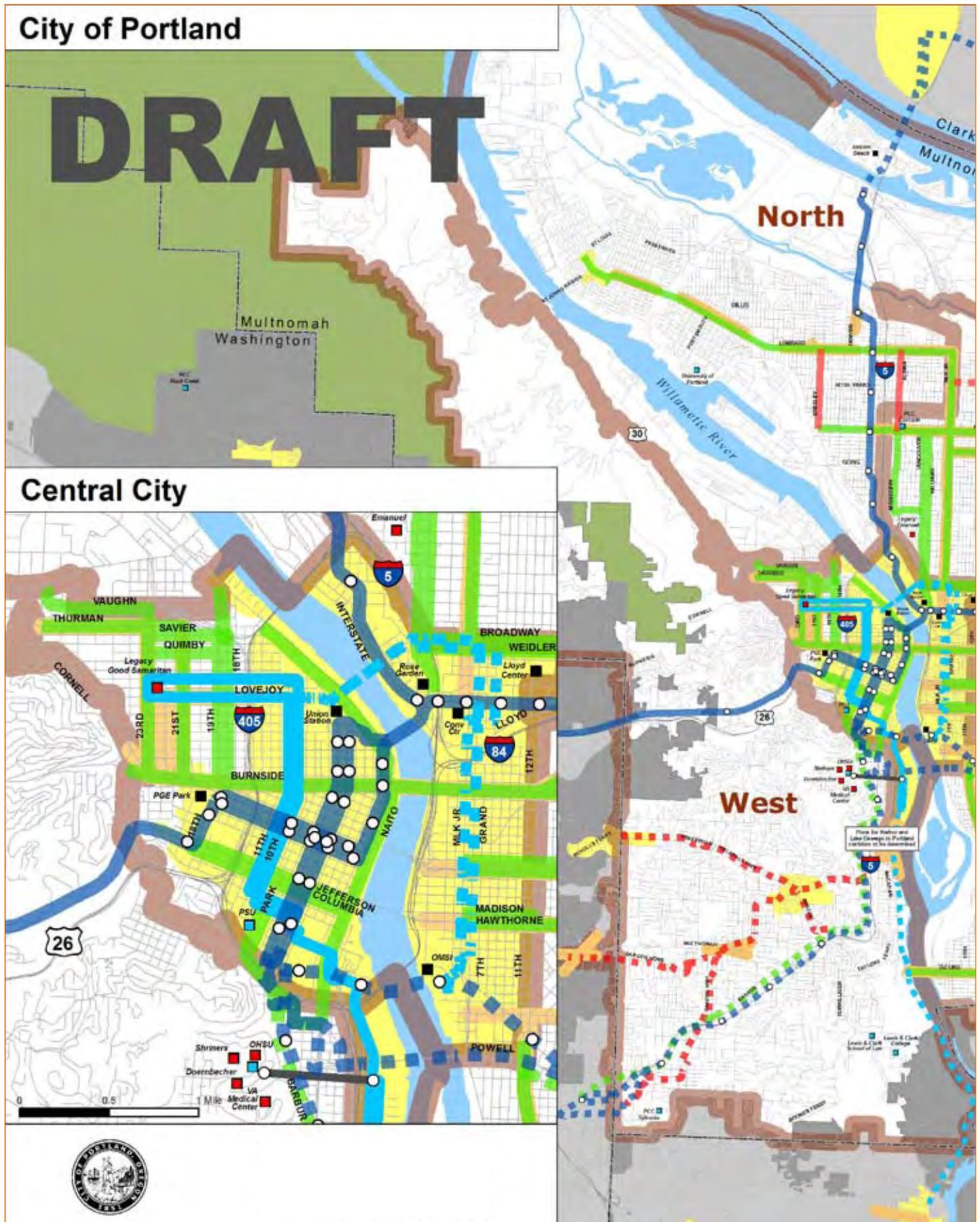
- ◆ Planning Commission and City Council

Narrowing of the Corridors

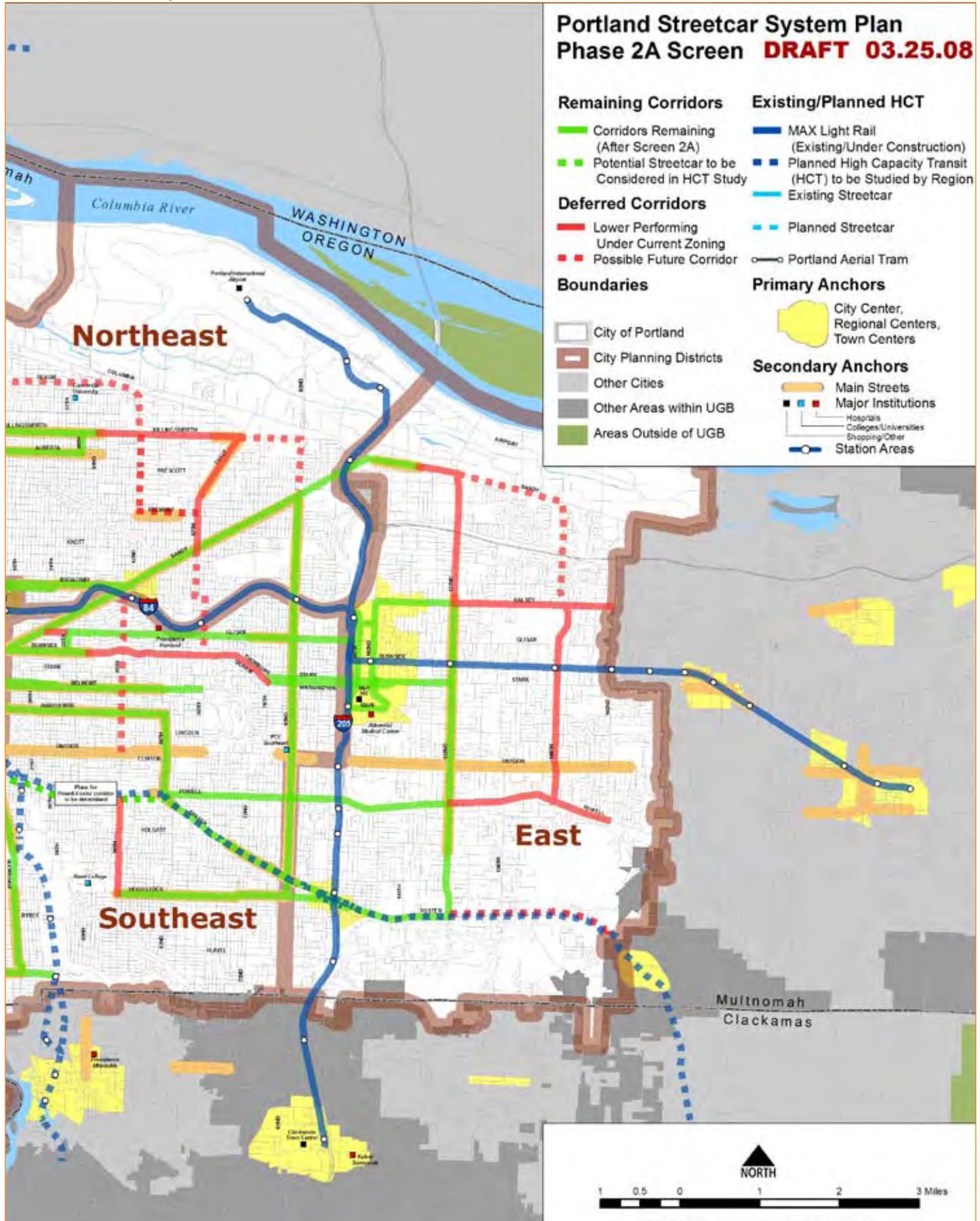
Narrowing the Portland Streetcar Corridors will occur through three phases of analysis. The analysis measures for each of the screening phases are illustrated in this graphic.



Current Corridors Under Consideration: Where We



Are Today



What Implementation Strategies Will Be Defined Within the Portland Streetcar System Plan?

Following the selection of the corridors for the Portland Streetcar System Plan (SSP), implementation strategies will be developed. These strategies will define the necessary elements to successfully implement the SSP. The strategies will address the following issues:

- 1. Operations** – Implementation strategies will examine how each corridor would operate as well as how all the corridors would collectively work as a system. Operation of the streetcar corridors as a system is intended to enhance the existing LRT and bus systems.
- 2. Financing** – Implementation strategies will examine options for financing construction and operations of the system. Local, regional, state and federal funding options will be identified, including Local Improvement Districts (LIDs), Urban Renewal District resources, New Starts/Small Starts, etc.
- 3. Phasing** – Implementation strategies will examine which of the system plan corridors will be developed early, and later, and in what sequence. Phasing will be dependent upon community support, finance opportunities, operational considerations and other factors.
- 4. Integration into the Portland Plan Process** – The SSP will be an important input into the Bureau of Planning’s 3-year Portland Plan process that is underway. The streetcar corridors will become key organizing elements of the City’s plans to organize future population and employment growth within the City.
- 5. Community Support** – A key element of moving any streetcar corridor forward will be continued support from the community in the corridor. Community support encompasses several factors including general support for streetcar from people and businesses in the neighborhood. As a corridor moves forward into planning and design, the streetcar project would be developed in close coordination with neighborhood plans and community visions.

How Long Will it Take?

Under the current Federal funding avenues, each streetcar corridor will need to advance individually as a separate project. Each project will undergo a thorough analysis to determine the best mode of transit service to meet the needs of the community and to warrant Federal funding. The timeline below approximates the current timeframe for a streetcar project to move through the planning, design and construction phases.

Currently, Congressman Earl Blumenauer and other members of relevant Federal transportation committees are crafting a new Federal funding program designed to expedite the Federal approval process and foster the development of modern streetcar communities. This new funding mechanism, and its streamlined Federal approval process has the potential to save millions of dollars in overall project costs.

Typical Timeframe for Streetcar Corridor Project (3 to 5 miles) (Assumes Current Federal Funding Process)				
Months	12	24	36	48-60
	Alternatives Analysis	Environmental and Preliminary Design	Engineering	Construction
Tasks	Analyze appropriate mode Transit modeling Ridership forecasting Concept design Federal funding application Public outreach	Environmental documentation Preliminary design Cost estimating Operations planning Local funding strategy Federal funding approvals Public outreach	Final design Cost estimating Project cost controls Vehicle procurement Public outreach	Construction Quality assurance monitoring Project cost controls Vehicle delivery Public outreach

The Oregonian

The ABCs of the streetcar

Federal transit officials should heed the law, not their own dogma, in evaluating transit projects

Sunday, September 30, 2007

If the Portland Streetcar were just about going from Point A to Point B, it would still be parked on Earl Blumenauer's "to do" list -- its first stop, before his 1987 speech at the City Club.

The streetcar's taken off because it has oomph, not just to get across town, but across decades. Its ability to electrify developers has Portland business districts clamoring for their own extensions and 80-some communities across the nation dreaming of laying tracks.

Congress is not confused on this point. Congress has enacted criteria for the Small Starts transit program (designed by now-Rep. Blumenauer, D-Ore.) based on the potential to generate economic development.

But federal transit officials are flouting the law and skewing the evaluation process in favor of buses.

As The Oregonian's Dylan Rivera reported recently, the feds are putting more weight on how quickly a vehicle moves and how far it goes. That rigs the process against streetcars, since they tend to be slower and stay closer to the heart of a city. The net effect has been to discourage other cities from applying for Small Starts funding. By winnowing competition, that could help Portland secure funds, but it's not good for other places.

Adding buses is less expensive, but not as expansive. A bus will never stretch a downtown as the streetcar has helped stretch Portland's, to the Pearl and the South Waterfront. If a city can come up with the local matching funds to invest in a streetcar -- and thereby in its own revitalization -- federal officials shouldn't discriminate against that city.

Perhaps those bureaucrats need some basic reminders about the benefits of the streetcar, beyond Point A and Point B.

Point C: It's a catalyst for construction, convincing developers to build . . . Point D: Denser and higher. The Eastside Streetcar is expected to trigger development of 4,537 housing units, in contrast to 1,105 without it.

Developers love it because it makes an area more . . .

E: Exciting for residential buyers. They're drawn to it, in part, because a streetcar is simply:

F: Fun to ride, more fun than a bus. Yet it's also arguably . . .

G: Greener, because it promotes compact development. It's . . .

H: Historic, because streetcars once ruled the streets of many cities, including Portland, but it's . . .

I: Innovative, too, something Americans value. It's a natural-born . . .

J: Joiner, fastening old neighborhoods together in new ways. And in going around and coming around, it has good . . .

K: Karma. The good deeds it inspires don't always extend to paying the fare, but you do catch a great feeling that we-are-all-part-of-this-urban-experiment.

L: It's less expensive to build than light rail (though not as much less as you might think). TriMet pegs the cost of a streetcar at \$44 million per mile, contrasted with light rail at \$51 million. Like light rail, it creates an . . .

M: Marketing mystique that magnetizes investment, and yet it's far more . . .

N: Nimble and less neighborhood-interrupting than building light-rail. Plus,

O: It's more of an obesity reducer than the bus. OK, we can't prove this, but the streetcar, while frequent, is slow. People rapidly discover that they're better off walking than waiting for it to come. And a streetcar makes it more inviting to walk, anyway, because, unlike a bus, it adds . . .

P: Pizazz to a streetscape. It's also more welcome because it's so much . . .

Q: Quieter than either cars or buses. And more . . .

R: Reliable. A bus line can be changed on a whim, which is why there's less investment along bus lines. Then, too, it's . . .

S: Sleek and even a tad . . .

T: Trendy. By comparison with a bus, we do not deny that a streetcar is decidedly . . .

U: Upscale. It can actually persuade people to abandon suburbia and embrace a more urban life. Yet it's useful, too, making it easier to declare . . .

V: Victory over your car, because it's a

W: "Walk-extender," spurring a city's walkability quotient, and adding . . .

X: An exhilarating "X" factor to any neighborhood, to keep it forever . . .

Y: Young. Not only by drawing young "creatives" to Portland, but also by inspiring old neighborhoods to a rebirth. Buses, to be sure, can take you where you want to go, but a streetcar goes someplace else. It . . .

Z: Zooms toward the future.

Analyze what cities want with such projects, and it's obviously not just transportation. Nationally, what's becoming known as "A Desire Named Streetcar" involves a lust for transformation -- a healthy urge for cities.

The feds should be encouraging it, not stifling it.

Portland Streetcar System Plan | **WHY STREETCARS?**
The Role of Streetcars in Portland

