

Transit Strategies

Modern Streetcar Service



After largely abandoning streetcars in the mid-20th century, cities across the country have recently been redeveloping streetcar systems to drive both urban connectivity and economic development.

Once drawn by horse through muddy streets, streetcars were electrified in mid-19th century England, quickly spread throughout Europe and the Americas, and eventually found popularity in cities around the world. The mark of the futuristic American city as late as the 1920s, rising labor and capital costs and the rise of the automobile squeezed streetcars to near extinction by the 1950s.

However, as the 20th century drew to a close, politicians and transit officials sought an affordable alternative to light rail that could draw riders and stimulate development in a similar manner as light rail. The first so-called heritage systems, largely geared toward tourists, came online in the 1980s. The 2001 launch of the modern Portland Streetcar and its success in revitalizing neighborhoods elevated interest to new levels.

Dallas, TX Streetcar



Portland, OR Streetcar



Benefits of Streetcar Service

The development of streetcar service has become popular for many reasons:

- **Stimulate Development:** Streetcars support smart growth principles such as transit-oriented development and neighborhoods that are walk- and bike-friendly. In many cities, streetcars have shown significant economic development benefits.
- **Service Quality:** Streetcars tend to be implemented in compact, urban areas where rail can provide high-quality service. The convenience of frequent stops can attract casual riders or those who have other travel options.
- **Ride Quality/Comfort:** Streetcars tend to be more comfortable than buses and other road vehicles due to smooth acceleration that reduces lurching and fixed wheels that reduce swaying.
- **Environmental Transit:** Streetcars are powered by electricity, eliminating vehicle emissions and providing quieter operations than diesel buses.
- **Lower Cost and Less Impact:** Streetcars are cheaper to build than light rail, have fewer construction impacts, and fit into an urban setting more easily than other forms of rail transit.

Differences between Streetcar and Light Rail

Streetcar service is often confused with light rail. The major difference is that streetcars run in mixed-traffic whereas light rail runs in dedicated lanes and that streetcars serve shorter lines and usually run in single car units. A summary of differences is shown below.

Service Element	Streetcar	Light Rail
Vehicles	Modern or historic streetcar	Modern light rail vehicle
Train Length	One	Two to three
Line Length	Shorter	Longer
Running Way	Mixed traffic	Dedicated right-of-way
Fare Collection	On station platform or on vehicle	On station platform
Stations	Short platforms; modest facilities	Long platforms; significant facilities
Station Spacing	2 to 3 blocks	½ to 1 mile
Speed	Slower	Faster
Development Benefits	Along line	Around stations
Construction Impacts	Moderate	Major

Economic Development Impacts

One major reason for streetcar's recent popularity is its ability to stimulate economic development. In Portland, OR, which was the first city to implement modern streetcar service, it is estimated that over \$3.5 billion of investment has occurred within two blocks of streetcar service. In Seattle, new development occurred along much of Westlake Avenue which is served by the South Lake Union Line; a significant amount of that growth is driven by Amazon. In Tucson, Sun Link is credited with \$1 billion in new development. And in Kansas City, the Ride KC Streetcar has also been credited with \$2 billion in development within the downtown Transportation Development District.

Streetcar Elements

Streetcars combine a number of elements that work together to produce attractive and compelling service:

- **Mixed Traffic Operations** allow for integration into a neighborhood and current streetscape but can lead to streetcars stuck in general traffic.
- **Vehicles** provide greater comfort, run on electricity (typically with overhead catenary wires and poles but with wireless capabilities emerging), and have a greater carrying capacity than buses.
- **A Unique Identity** to increase the service's visibility and attract new riders and visitors.
- **Streetcar Stations** provide more features, amenities, and levels of passenger comfort than a bus stop but are more minimalist than a light rail or heavy rail station.
- **Level Boarding** reduces dwell times and facilitates boarding and alighting by people with disabilities.

- **Fare Collection** via pre-paid passes or tickets eliminates delays associated with collecting fares as people board.
- **Real Time Passenger Information** lets passengers know when the streetcar will actually arrive or depart from stations, reducing much of the uncertainty associated with transit service.

These measures work together to make service enjoyable, convenient, and comfortable, and to catalyze development along the streetcar line. More in-depth discussion of each of these elements is provided below.

Modern Streetcar Vehicles

Streetcar systems can feature a wide range of vehicles and passenger amenities. Streetcar vehicles are generally single-car trains that operate primarily in a shared right-of-way with general traffic. Modern streetcars share most of their technical characteristics with modern light rail vehicles. However, modern streetcar vehicles are sometimes narrower and are usually limited to a single car length (often articulated), unlike light rail or heavy systems that couple as many as eight cars together. Streetcars are also designed for lower maximum speeds.

Salt Lake City's Sugar House Streetcar



Seattle's Modern Streetcar Interior



Mixed Traffic Operations

Streetcars generally run in mixed traffic, which reduces initial capital costs and is less disruptive than typical light rail systems, but also tends to lead to lower vehicle speeds, since vehicles can get stuck in general traffic. However, streetcars can also operate in dedicated rights-of-way.

DC Streetcar Operates in Mixed Traffic



Portland Streetcar with In-Street Platform



Unique identity

Whether employing historic or modern vehicles, transit agencies can use distinctive branding to increase the service's visibility and to attract new riders and visitors.

Tucson Sun Link



RideKC Streetcar



Streetcar Stations

Streetcar stations are generally similar to minimalist light rail stations. Specific design features vary depending upon passenger volumes, location, type of facility, and available space. Streetcar stations are often less elaborate and have shorter platforms than light rail stations due to shorter train lengths.

New Orleans Loyola Streetcar Station *Atlanta streetcar station*



Level Boarding

Modern streetcar systems are typically designed to support level boarding. This is accomplished by using high-platform stations. Level boarding allows passengers to board and alight faster, greatly reducing dwell times. Level boarding also makes it much easier for people with disabilities to use the system and eliminates the need to use lifts.

Fare Collection

Off-board fare collection can significantly reduce dwell times at stations by eliminating the need for passengers to pay fares as they board vehicles. Ticket vending machines at stops and stations allow passengers to purchase a ticket before boarding the streetcar. Some systems feature on-board payment as well.

Level Boarding Makes Boarding Easier



On-board fare collection

Off-board streetcar ticket vending machine



Real-Time Passenger Information

Real-time passenger information at stations lets riders know when the streetcar will actually arrive, reducing some of the uncertainty often associated with transit service.

Real-Time Schedule Information on Seattle's South Lake Union Streetcar



Examples of Modern Streetcar Systems

Seattle Streetcar, Seattle, WA

Opened in 2007, the 1.3-mile South Lake Union Streetcar line connects a waterfront park and museum, the booming South Lake Union neighborhood (home to Amazon headquarters), a major medical campus, the Westlake Shopping Center, and the downtown transit tunnel (serving local and regional buses as well as Link light rail). Built for \$56 million, nearly half of the initial capital costs were provided by adjacent property owners through a Local Improvement District. The remaining funding was provided through a combination of local, state, and federal dollars. The line has proved so popular that employers along the route are now providing funds to reduce afternoon peak headways from 15 minutes to 10 minutes. A second streetcar line opened in 2016 in Seattle's First Hill neighborhood, and a third line—the Center City Connector—to link the two lines through the heart of downtown is being considered.

South Lake Union Streetcar



Minimalist Streetcar Stop and Shelter



OKC Streetcar, Oklahoma City, OK

Oklahoma City's OKC Streetcar opened in late 2018 and serves two loops – a Downtown Loop that operates seven days a week and a Bricktown loop that operates on Fridays, Saturdays, and Sundays, opened in late 2018. These loops serve Midtown, Automobile Alley, City Center, and Bricktown. In total, the two loops operate along 4.7 miles of rack and serve 22 stations.



Ride KC Streetcar, Kansas City, MO

The Kansas City streetcar, which opened in 2016 and runs approximately two miles from the River Market District north of downtown to Crown Center south of downtown via downtown and the emerging Crossroads District, is considered to be one of America’s most successful modern streetcar services. The line has generated approximately \$2 billion in new economic development and is credited with helping to draw new residents to downtown and stimulating new investment in the Crossroads District. The line carried its five millionth rider in 2018. The city is now planning a southward extension.

RideKC Streetcar at the Southern End of the Line



Sun Link, Tucson, AZ

Opened in 2014, the 3.9-mile Sun Link line connects the Tucson Convention Center with downtown Tucson, prime shopping and restaurant districts, the University of Arizona, and a major medical center. Retail business owners along the route have also credited the line with an increase in sales. The local transit agency attributes more than \$1 billion in development to the new streetcar.

Sun Link Operates in Mixed Traffic

Sun Link Streetcar Route



Funding for the \$196 million line was primarily provided by a voter-approved, countywide transportation plan, as well as \$70 million in federal grants. The Pima (County) Association of Governments has identified several possible corridors for Sun Link expansion, although plans are still at a concept stage.

Portland Streetcar, Portland, OR

The first of the modern streetcar lines, the Portland Streetcar serves about 15,000 riders a day on a three-line, 16-mile system (expanded from just one line in 2001). The service operates at 15-20 minute frequencies, though the areas where lines overlap have 7-10 minute frequencies. The original 4.8-mile loop was almost entirely funded locally. An FTASmall Starts grant funded \$75 million of the second line, a 3-mile extension that opened in 2012 at a cost of \$147 million.

Streetcar in Portland's Pearl District



Streetcar Uses the Tilikum Crossing



In 2008, city transportation department officials indicated \$3.5 billion in development had occurred within two blocks of the streetcar line. The system is widely credited with helping revitalize the famous Pearl District neighborhood.

Potential Streetcar Service in Fort Worth

Streetcar service in Fort Worth is not a new idea and was last examined between 2008 and 2010 when the city conducted a preliminary assessment of costs and benefits, including potential funding sources. The primary corridors for consideration included downtown, North Main, West 7th, East Rosedale, and South

2010 Proposed Streetcar Starter Line (in Orange)



Main. Based on that assessment, the city and Trinity Metro identified a preferred “starter” corridor from the Near Northside through downtown to the Near Southside. However, the City Council voted against moving forward, calling instead for a comprehensive transit plan for Tarrant County.

Based on work conducted for this study to date, the original proposal for Near Northside – Near Southside service still appears valid. A second option would be streetcar service along West 7th Street.

Potential Streetcar Lines Based on 2040 Demand

